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 – 2023

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Revision 3

Contact:
Stuart Alexander
Environment Superintendent, Murray Basin
Stuart.Alexander@iluka.com

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Revision	Details of review or changes	Prepared by	Date
1	Final	C Mintern	25-07-2024
2	Minor change to include the number of soil samples taken.	C Mintern	15-11-2024
3	Minor change to include Auditor's recommendations.	C Mintern	10-12-2024

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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 though 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 6 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 2023 to 31st December 2023.

Key commentary on monitoring outcomes and performance against compliance objectives in the IWMP for the 2023 reporting period:

- A total of 159 loads of MSP by-products were disposed into Pit 23 between the 1/5/2023 and the 30/05/2023, totalling 6,066 tonnes.
- The average concentration for Uranium (U) and Thorium (Th) for by-product waste received into Pit 23 was 1.43 ppm and 18.92 ppm respectively. The dust filter bags Uranium and Thorium concentration was 17.88 ppm and 223 ppm respectively, refer to Table 2 below.
- No transport incidents or spillages occurred.

Summary 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 25th 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 endues utilisation of Pit 23 and to vary the rehabilitation plan; and*
> b. *Iluka has applied to the Minister to surrender part of MIN 5367[1] (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 13th April 2017, and the partial surrender of MIN 5367 was registered on 11th May 2017, this being the date of commencement of the Permit.

[1] Iluka Resources Douglas Mine – Mining Licence No. 5367 ('MIN 5367')

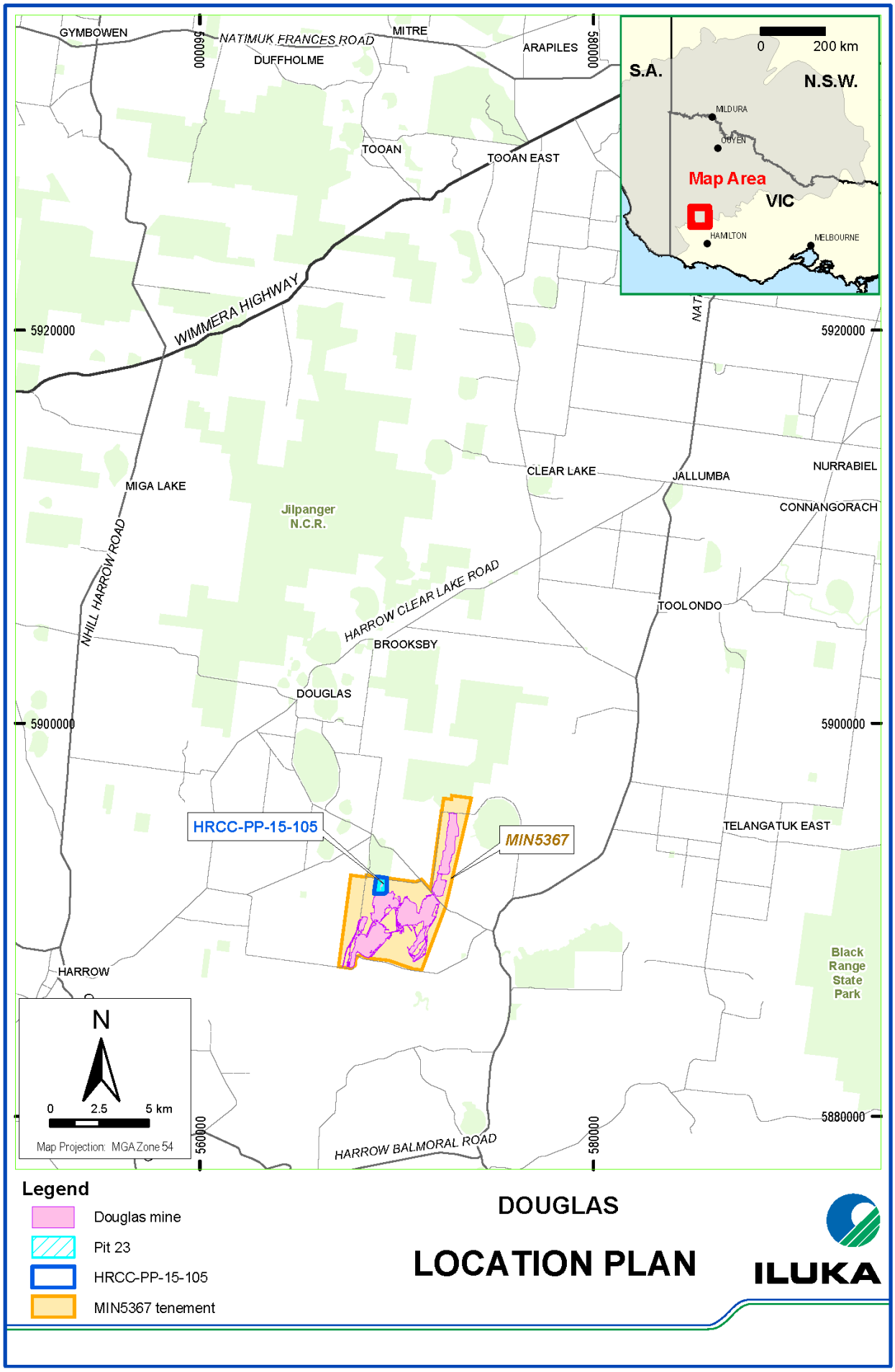

Figure 1. Location of the Douglas Mine.

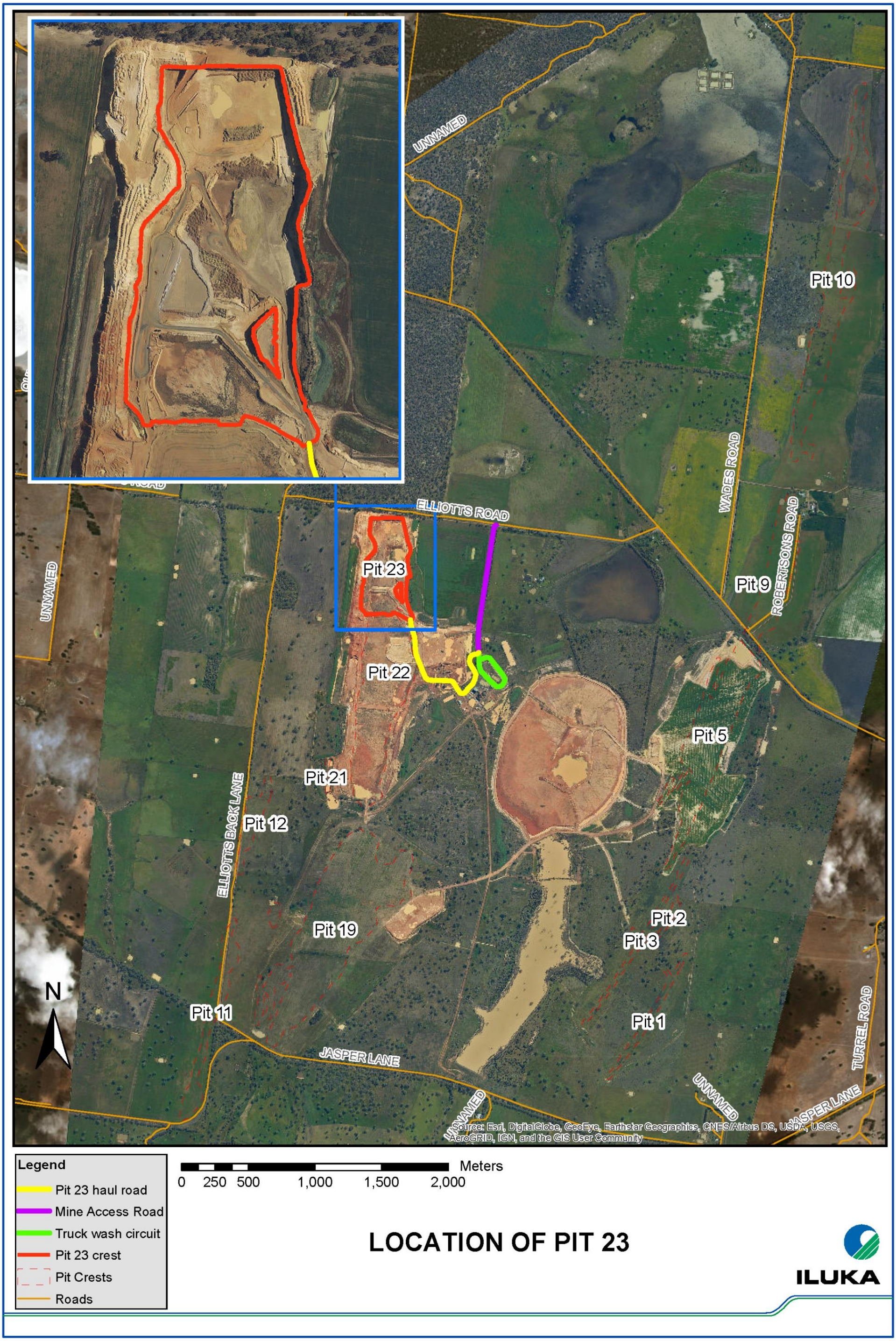

Figure 2. Location of Pit 23.

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 (GWMMP);
    - Surface Water Monitoring and Management Plan (SWMMP);
    - 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 16th of December 2020. HRCC provided formal endorsement of the plans on the 29th September 2021.

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 6 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*
> - *radioactive properties of the material being transported, being*
> - *for MSP by products, the average concentrations of uranium and thorium in ppm determined through weekly analysis (normal MSP operations) or representative sampling (non-routine MSP operations);*
> - *for used filter bags, the measure concentrations of uranium and thorium ppm;*
> - *for concentrated scrap steel and concrete, NORM nuclide activity concentrations in ppm, as determined through representative sampling.*
> - *For the report period:*
> - *records of any transport incidents or spills and remedial actions taken in the event of such incidents; 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 6 of the endorsed IWMP, data associated with each load of incoming waste is shown in Table 1. A total of 159 loads of material were received into Pit 23 in the 2023 reporting period.

Table 1: Individual load data for incoming wastes to Pit 23 in 2023.

Date	Week No.	Source site	Location Code	Material Code	Load weight (t)
1/05/2023	1	MSP	Pit 23	Dust bags	4.5
1/05/2023	1	MSP	Pit 23	Dry Rejects	34.98
2/05/2023	1	MSP	Pit 23	Dry Rejects	38.34
3/05/2023	1	MSP	Pit 23	Dry Rejects	39.48
3/05/2023	1	MSP	Pit 23	Dry Rejects	39.50
3/05/2023	1	MSP	Pit 23	Dry Rejects	38.84
3/05/2023	1	MSP	Pit 23	Dry Rejects	39.52
3/05/2023	1	MSP	Pit 23	Dry Rejects	38.50
3/05/2023	1	MSP	Pit 23	Dry Rejects	38.42
4/05/2023	1	MSP	Pit 23	Dry Rejects	39.30
4/05/2023	1	MSP	Pit 23	Dry Rejects	38.24
4/05/2023	1	MSP	Pit 23	Dry Rejects	39.10
4/05/2023	1	MSP	Pit 23	Dry Rejects	39.10
4/05/2023	1	MSP	Pit 23	Dry Rejects	38.28
4/05/2023	1	MSP	Pit 23	Dry Rejects	38.48
4/05/2023	1	MSP	Pit 23	Dry Rejects	37.78
5/05/2023	1	MSP	Pit 23	Dry Rejects	38.44
5/05/2023	1	MSP	Pit 23	Dry Rejects	38.78
5/05/2023	1	MSP	Pit 23	Dry Rejects	38.47
5/05/2023	1	MSP	Pit 23	Dry Rejects	38.40
5/05/2023	1	MSP	Pit 23	Dry Rejects	38.41
8/05/2023	2	MSP	Pit 23	Dry Rejects	38.84
8/05/2023	2	MSP	Pit 23	Dry Rejects	38.06
8/05/2023	2	MSP	Pit 23	Dry Rejects	38.84
8/05/2023	2	MSP	Pit 23	Dry Rejects	38.60
8/05/2023	2	MSP	Pit 23	Dry Rejects	37.38
8/05/2023	2	MSP	Pit 23	Dry Rejects	38.30
8/05/2023	2	MSP	Pit 23	Dry Rejects	36.78
8/05/2023	2	MSP	Pit 23	Dry Rejects	38.38
8/05/2023	2	MSP	Pit 23	Dry Rejects	38.18
8/05/2023	2	MSP	Pit 23	Dry Rejects	39.38
9/05/2023	2	MSP	Pit 23	Dry Rejects	37.94
9/05/2023	2	MSP	Pit 23	Dry Rejects	36.20
9/05/2023	2	MSP	Pit 23	Dry Rejects	37.70
9/05/2023	2	MSP	Pit 23	Dry Rejects	36.34
9/05/2023	2	MSP	Pit 23	Dry Rejects	37.98
9/05/2023	2	MSP	Pit 23	Dry Rejects	37.10

9/05/2023	2	MSP	Pit 23	Dry Rejects	37.98
9/05/2023	2	MSP	Pit 23	Dry Rejects	38.82
9/05/2023	2	MSP	Pit 23	Dry Rejects	37.80
10/05/2023	2	MSP	Pit 23	Dry Rejects	38.00
10/05/2023	2	MSP	Pit 23	Dry Rejects	36.90
10/05/2023	2	MSP	Pit 23	Dry Rejects	38.36
10/05/2023	2	MSP	Pit 23	Dry Rejects	36.96
10/05/2023	2	MSP	Pit 23	Dry Rejects	39.28
10/05/2023	2	MSP	Pit 23	Dry Rejects	38.02
10/05/2023	2	MSP	Pit 23	Dry Rejects	36.88
10/05/2023	2	MSP	Pit 23	Dry Rejects	37.58
10/05/2023	2	MSP	Pit 23	Dry Rejects	38.48
11/05/2023	2	MSP	Pit 23	Dry Rejects	37.68
11/05/2023	2	MSP	Pit 23	Dry Rejects	38.10
11/05/2023	2	MSP	Pit 23	Dry Rejects	37.32
11/05/2023	2	MSP	Pit 23	Dry Rejects	37.10
11/05/2023	2	MSP	Pit 23	Dry Rejects	36.76
11/05/2023	2	MSP	Pit 23	Dry Rejects	38.12
11/05/2023	2	MSP	Pit 23	Dry Rejects	37.18
11/05/2023	2	MSP	Pit 23	Dry Rejects	36.98
12/05/2023	2	MSP	Pit 23	Dry Rejects	38.54
12/05/2023	2	MSP	Pit 23	Dry Rejects	39.50
12/05/2023	2	MSP	Pit 23	Dry Rejects	38.18
12/05/2023	2	MSP	Pit 23	Dry Rejects	38.50
12/05/2023	2	MSP	Pit 23	Dry Rejects	39.02
12/05/2023	2	MSP	Pit 23	Dry Rejects	37.08
12/05/2023	2	MSP	Pit 23	Dry Rejects	37.28
12/05/2023	2	MSP	Pit 23	Dry Rejects	37.43
12/05/2023	2	MSP	Pit 23	Dry Rejects	37.88
15/05/2023	3	MSP	Pit 23	Dry Rejects	39.86
15/05/2023	3	MSP	Pit 23	Dry Rejects	38.80
15/05/2023	3	MSP	Pit 23	Dry Rejects	38.10
15/05/2023	3	MSP	Pit 23	Dry Rejects	39.88
15/05/2023	3	MSP	Pit 23	Dry Rejects	38.42
15/05/2023	3	MSP	Pit 23	Dry Rejects	37.18
15/05/2023	3	MSP	Pit 23	Dry Rejects	37.48
15/05/2023	3	MSP	Pit 23	Dry Rejects	37.94
15/05/2023	3	MSP	Pit 23	Dry Rejects	37.82
16/05/2023	3	MSP	Pit 23	Dry Rejects	38.94
16/05/2023	3	MSP	Pit 23	Dry Rejects	39.36
16/05/2023	3	MSP	Pit 23	Dry Rejects	38.34
16/05/2023	3	MSP	Pit 23	Dry Rejects	38.26
16/05/2023	3	MSP	Pit 23	Dry Rejects	37.88
16/05/2023	3	MSP	Pit 23	Dry Rejects	38.48
16/05/2023	3	MSP	Pit 23	Dry Rejects	38.26
16/05/2023	3	MSP	Pit 23	Dry Rejects	37.88
17/05/2023	3	MSP	Pit 23	Dry Rejects	39.40

17/05/2023	3	MSP	Pit 23	Dry Rejects	40.02
17/05/2023	3	MSP	Pit 23	Dry Rejects	40.04
17/05/2023	3	MSP	Pit 23	Dry Rejects	39.74
17/05/2023	3	MSP	Pit 23	Dry Rejects	39.84
17/05/2023	3	MSP	Pit 23	Dry Rejects	39.80
17/05/2023	3	MSP	Pit 23	Dry Rejects	38.48
17/05/2023	3	MSP	Pit 23	Dry Rejects	37.92
17/05/2023	3	MSP	Pit 23	Dry Rejects	38.48
18/05/2023	3	MSP	Pit 23	Dry Rejects	38.86
18/05/2023	3	MSP	Pit 23	Dry Rejects	38.96
18/05/2023	3	MSP	Pit 23	Dry Rejects	39.22
18/05/2023	3	MSP	Pit 23	Dry Rejects	39.48
18/05/2023	3	MSP	Pit 23	Dry Rejects	39.84
18/05/2023	3	MSP	Pit 23	Dry Rejects	39.78
18/05/2023	3	MSP	Pit 23	Dry Rejects	38.48
18/05/2023	3	MSP	Pit 23	Dry Rejects	37.38
18/05/2023	3	MSP	Pit 23	Dry Rejects	38.40
19/05/2023	3	MSP	Pit 23	Dry Rejects	38.48
19/05/2023	3	MSP	Pit 23	Dry Rejects	34.50
19/05/2023	3	MSP	Pit 23	Dry Rejects	39.50
19/05/2023	3	MSP	Pit 23	Dry Rejects	37.94
19/05/2023	3	MSP	Pit 23	Dry Rejects	39.68
19/05/2023	3	MSP	Pit 23	Dry Rejects	38.36
19/05/2023	3	MSP	Pit 23	Dry Rejects	38.48
19/05/2023	3	MSP	Pit 23	Dry Rejects	37.60
19/05/2023	3	MSP	Pit 23	Dry Rejects	37.47
22/05/2023	4	MSP	Pit 23	Dry Rejects	38.32
22/05/2023	4	MSP	Pit 23	Dry Rejects	39.54
22/05/2023	4	MSP	Pit 23	Dry Rejects	39.14
22/05/2023	4	MSP	Pit 23	Dry Rejects	39.26
22/05/2023	4	MSP	Pit 23	Dry Rejects	38.75
22/05/2023	4	MSP	Pit 23	Dry Rejects	38.70
22/05/2023	4	MSP	Pit 23	Dry Rejects	38.46
22/05/2023	4	MSP	Pit 23	Dry Rejects	39.16
22/05/2023	4	MSP	Pit 23	Dry Rejects	39.84
23/05/2023	4	MSP	Pit 23	Dry Rejects	38.60
23/05/2023	4	MSP	Pit 23	Dry Rejects	39.02
23/05/2023	4	MSP	Pit 23	Dry Rejects	40.20
23/05/2023	4	MSP	Pit 23	Dry Rejects	39.10
23/05/2023	4	MSP	Pit 23	Dry Rejects	39.16
23/05/2023	4	MSP	Pit 23	Dry Rejects	39.30
23/05/2023	4	MSP	Pit 23	Dry Rejects	39.78
23/05/2023	4	MSP	Pit 23	Dry Rejects	39.52
23/05/2023	4	MSP	Pit 23	Dry Rejects	39.22
24/05/2023	4	MSP	Pit 23	Dry Rejects	39.34
24/05/2023	4	MSP	Pit 23	Dry Rejects	40.20
24/05/2023	4	MSP	Pit 23	Dry Rejects	38.64

24/05/2023	4	MSP	Pit 23	Dry Rejects	39.00
24/05/2023	4	MSP	Pit 23	Dry Rejects	39.70
24/05/2023	4	MSP	Pit 23	Dry Rejects	38.00
24/05/2023	4	MSP	Pit 23	Dry Rejects	39.08
24/05/2023	4	MSP	Pit 23	Dry Rejects	39.78
24/05/2023	4	MSP	Pit 23	Dry Rejects	39.72
25/05/2023	4	MSP	Pit 23	Dry Rejects	36.60
25/05/2023	4	MSP	Pit 23	Dry Rejects	37.25
25/05/2023	4	MSP	Pit 23	Dry Rejects	37.50
25/05/2023	4	MSP	Pit 23	Dry Rejects	38.30
25/05/2023	4	MSP	Pit 23	Dry Rejects	38.10
26/05/2023	4	MSP	Pit 23	Dry Rejects	37.40
26/05/2023	4	MSP	Pit 23	Dry Rejects	37.12
26/05/2023	4	MSP	Pit 23	Dry Rejects	37.52
26/05/2023	4	MSP	Pit 23	Dry Rejects	37.70
26/05/2023	4	MSP	Pit 23	Dry Rejects	37.38
26/05/2023	4	MSP	Pit 23	Dry Rejects	38.30
26/05/2023	4	MSP	Pit 23	Dry Rejects	36.34
26/05/2023	4	MSP	Pit 23	Dry Rejects	37.88
29/05/2023	5	MSP	Pit 23	Dry Rejects	34.78
29/05/2023	5	MSP	Pit 23	Dry Rejects	38.90
29/05/2023	5	MSP	Pit 23	Dry Rejects	36.60
29/05/2023	5	MSP	Pit 23	Dry Rejects	38.70
29/05/2023	5	MSP	Pit 23	Dry Rejects	39.30
29/05/2023	5	MSP	Pit 23	Dry Rejects	39.00
30/05/2023	5	MSP	Pit 23	Dry Rejects	40.20
30/05/2023	5	MSP	Pit 23	Dry Rejects	39.00
30/05/2023	5	MSP	Pit 23	Dry Rejects	37.00

3.2 Reporting period monitoring data

In accordance with Section 6 of the endorsed IWMP, the monthly average radioactivity of by-products shall be reported. A total of 159 loads (total of 6,066 tonnes) of by-products were transported and disposed into Pit 23 during 2023. 20 soil samples (during a non-routine MSP period of operation) were taken for radionuclide analysis with the results shown in Table 2. The number of dry circuit reject samples analysed satisfied the requirements outlined in the EPA Victoria Soil Sampling for Waste Soils Guidance (EPA Publication 702.2 May 2024). The sampling of dust filter bags were undertaken by cutting 20cm by 20cm section from five random filter bags. Each sample was placed in individual air tight sealed bags and sent to an external lab to undertake uranium and thorium concentration analysis.

Table 2: Quantities and radioactivity results for disposed MSP by-products during 2023.

Product	Product (tonnes)	Th (ppm)	U (ppm)
Dry circuit rejects	6,061.5	18.92	1.43
Wet circuit rejects	0	n/a	n/a
Baghouse dust filter bags	4.5	223	17.88
Total	6,066		

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.