ILUKA

ABN 34 008 675 018

ILUKA RESOURCES LIMITED

TECHNICAL REPORT

JACINTH-AMBROSIA PROJECT

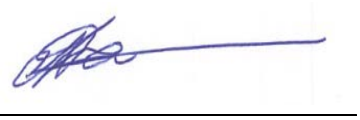
Mining and Rehabilitation Compliance Report 2014

Nick Travers
Joanne Lee
Tina Law
Tom McCarthy
Sara Avory

31st March 2015

Report sign-off:

ISSUED:

NAME:	Nick Travers	**DATE:**	31/3/15
POSITION:	Superintendent – Environment, Rehabilitation & Community Relations	**SIGNATURE:**	

REVIEWED / APPROVED:

NAME:	Dan McGrath	**DATE:**	31/3/15
POSITION:	Manager Eastern Operations	**SIGNATURE:**	

MARCR 2014 – Revision Status

Revision	Date	Revision Comments
1.0	30/03/2015	Review Version
2.0	31/03/2015	Final Version

Table of Contents

1 Executive Summary 1-1

2 Introduction 2-2

2.1 Background 2-2
2.2 Purpose 2-2
2.3 Exclusions 2-2

3 Description of mining activities 3-3

3.1 Mining Activities 2014 3-3

4 Ore reserves and mine life 4-4

5 Rehabilitation and environmental management activities 5-5

5.1 Iluka Environmental Management Systems 5-5
5.2 Incident Reporting 5-6
5.3 Rehabilitation Summary 5-6
5.4 Rehabilitation Progress 2014, Plans 2015 5-10
5.5 Seed Collection Program 5-14
5.6 Rehabilitation Research and Monitoring Program 5-14

6 Compliance with outcomes 6-18

6.1 Flora 6-18
6.1.1 Measurement of compliance 6-18
6.1.2 Summary of key measurements 6-19
6.2 Fauna 6-22
6.2.1 Measurement of compliance 6-22
6.2.2 Summary of key measurements 6-23
6.3 Pest Plants and Animals 6-26
6.3.1 Measurement of compliance 6-26
6.3.2 Summary of key measurements 6-27
6.4 Indigenous Heritage and Non-Indigenous Heritage 6-31
6.4.1 Measurement of compliance 6-31
6.4.2 Summary of key measurements 6-31
6.5 Soil 6-32
6.5.1 Measurement of compliance 6-32
6.5.2 Summary of key measurements 6-32
6.6 Surface Water Quality 6-33
6.6.1 Measurement of compliance 6-33
6.6.2 Summary of key measurements 6-34
6.7 Groundwater 6-35
6.7.1 Measurement of compliance 6-35
6.7.2 Summary of key measurements 6-36

6.8 Dust and Air Quality 6-49
6.8.1 Measurement of compliance 6-49
6.8.2 Summary of key measurements 6-50
6.9 Solid Waste 6-53
6.9.1 Measurement of compliance 6-53
6.9.2 Summary of key measurements 6-53
6.10 Hydrocarbon and Chemical Storage 6-56
6.10.1 Measurement of compliance 6-56
6.10.2 Summary of key measurements 6-56
6.11 Public Safety 6-60
6.11.1 Measurement of compliance 6-60
6.11.2 Summary of key measurements 6-60
6.12 Socio Economic 6-62
6.12.1 Measurement of compliance 6-62
6.12.2 Summary of key measurements 6-62
7 Rectification of non-compliances 7-67
7.1 Non-compliance 7-67
7.2 Action List from Previous MARCRs 7-67
8 Management and systems review 8-68
9 Fitness for purpose review of plant, equipment, infrastructure and other facilities 9-68
10 New environmental hazards 10-68
11 Environmental protection and biodivseristy conservation reporting 11-68
12 References 12-69

List of Figures

Figure 1 Disturbed and rehabilitated areas Domain 2 and Domain 4, 2014 5-9
Figure 2 Drawdown (actual vs. predicted) in monitoring wells north of borefield 6-37
Figure 3 Drawdown (actual vs. predicted) in monitoring wells south of borefield 6-38
Figure 4 TSF interception recovery (Dec 2012 - Feb 2014) 6-39
Figure 5 Long term trend in Southern TSF monitoring wells (1/11/11 - 1/2/15) 6-41
Figure 6 Long term trend in Northern TSF monitoring wells (1/9/09 - 1/2/15) 6-42
Figure 7 Long-term groundwater trend for Cell 1 bores 1/6/11 - 2/2/15 6-44
Figure 8 J-A site water balance 6-45
Figure 9 Trend in outlying mine site monitoring wells (1/6/2009 - 1/2/2015) 6-47
Figure 10 Twelve month groundwater contour trend, Jan 2014 vs. Jan 2015 6-48
Figure 11: Annual waste data - disposed vs recycled (tonnes) 6-55

List of Tables

Table 1 Details of mining project 3-3
Table 2 Mining Summary for Jacinth-Ambrosia, 2014 3-3
Table 3 Jacinth-Ambrosia Ore Reserves (JORC Status, as of 31 December 2013) 4-4
Table 4 Iluka EHS Standards (EHS Management System) 5-5
Table 5 Summary of environmental incidents and applicable MARCR section 5-6
Table 6 Disturbed and rehabilitated areas for 2014 reporting period 5-8
Table 7 J-A Rehabilitation Summary 5-10
Table 8 Summary of the J-A RAMP 2014-2015 program 5-15
Table 9 Summary of completed research programs 5-16
Table 10 Summary of compliance outcomes for flora 6-18
Table 11 Vegetation clearance totals (permitted vs. actual) 2008 - 2014 6-19
Table 12 Summary of outcome criteria for fauna 6-22
Table 13 Native fauna incidents summary, 2014 6-24
Table 14 Summary of compliance criteria for pest plants and animals 6-26
Table 15 Weed species recorded and managed in leasehold areas 2005-2014 6-29
Table 16 Pest animal events reported via Iluka personnel in 2014 6-30
Table 17 Pest animal species observations, EBS (2006 – 2014) 6-30
Table 18 Compliance criteria – Indigenous and non-Indigenous heritage 6-31
Table 19 Summary of outcome criteria for soil 6-32
Table 20 Summary of outcome criteria for surface water quality 6-33
Table 21 Summary of outcome criteria for groundwater 6-35
Table 22 Summary of outcome criteria for dust and air quality 6-49
Table 23 Summary of outcome criteria for solid waste 6-53
Table 24: Waste removed from site by category and year 6-54
Table 25 Summary of outcome criteria for hydrocarbon and chemical storage 6-56
Table 26 Summary of hazardous material events reported in 2014 6-57
Table 27 Summary of outcome criteria for public safety 6-60
Table 28 Summary of outcome criteria for socio economic 6-62
Table 29 Jacinth-Ambrosia current workforce statistics 6-63
Table 30 Summary of compliance – socio-economic criteria 6-64
Table 31 Action list from previous MARCRs 7-67

List of Plates

Plate 1 Canberra camp site 2009 5-12
Plate 2 Canberra camp site 2013 5-12
Plate 3 Lucas camp site 2011 5-13
Plate 4 Lucas camp site 2013 5-13
Plate 5 Tank farm 2009 5-13
Plate 6 Tank farm 2013 5-13
Plate 7 Rehabilitation in Cell 1 East with prolific plant growth evident 5-13
Plate 8 Rehabilitation of Cell 1 West 5-14
Plate 9 Wind mast clearance area rehabilitation, 2014 6-20
Plate 10 Access track rehabilitation, 2013 6-20
Plate 11 Access track rehabilitation, 2014 6-20
Plate 12 Rising stage sampler 6-34
Plate 13 BGM installation 6-52
Plate 14 Completed BGM trial 6-52
Plate 15 Overflow of wastewater from the humus tank at Jacinth village 6-59

Appendices

Appendix A Tables
Appendix B Weed mapping & management program 2014
Appendix C Waste and hydrocarbon records

1 EXECUTIVE SUMMARY

Iluka implemented and maintained Environmental Management Systems throughout 2014 and supported a wide ranging research program and several community programs to deliver on MARP commitments. Section 2 summarises 2014 mining activity and Section 4 describes the Environmental Management System supporting mining activities to minimise the impacts of operations on environmental, social and heritage aspects. Iluka inducted all personnel and contractors to ensure their environmental obligations for operating at the Jacinth Ambrosia mine site were understood.

Section 5 examines the performance of implemented systems against the outcomes and commitments of the MARP, ADP 2009/04, and ADEP 2008/021. Iluka is compliant with all ML, MPL and EML outcomes. Zero non -compliances occurred during the reporting period.

Personnel reported 323 environmental incidents relating to flora, fauna, pests, soils, waste, air, quality and compliance. Incident reporting increased from 2013 in line with continued improvement in workforce environmental incident awareness and the resumption of normal haulage and associated roadkill impacts on fauna. Statistics on 3rd party traffic and pedestrian hazards have also been included in support of reported public safety outcomes. Per historical trends hydrocarbon leak and spill incidents accounted for the majority of incidents in the reporting period.

No impacts to native flora and fauna species have been identified due to mining operations. Monitoring and data collection will continue through 2015. Weed diversity and abundance continue to be addressed through the site weed management program. Prioritised management targets for these are presented in this report. Successes were achieved with the rehabilitation of Cell 1 West which continues in-field trials undertaken in Cell 1 East and includes key sub-trials assessing alternate methods of soil return, seeding/germination comparisons (direct seeding, soil seed bank) and ripping variations. Outcomes of these assessments will be reported in due course.

Groundwater drawdown from the borefield palaeochannel remains within tolerance, with a general recovery in levels as a result of improved site operational water recoveries (averaging 70%) and reduced palaeochannel demand. Mine site groundwater levels show continued decline at the off-path TSF associated with the cessation of tailings and gradual north-westerly migration of the groundwater mound toward Lake Ifould. Southern TSF wells are now below the ‘safe’ level (40m bgl); northern TSF wells remain above the high or medium-risk zone but continue to decline. Groundwater levels at Cell 1 have stabilised with the transition of tailings from Cell 2 to Cell 3A and the subsequent reduction in local recharge of the residual groundwater mound at this location. Assessment of groundwater levels, migration and chemistry is ongoing at time of reporting.

A trial of bituminous geomembrane for HMC stockpile dust management was undertaken with comparison to the continuous application of water and stabiliser. Membrane application proof-of-concept was confirmed however existing suppression programs are preferred. Monitoring and assessment of dust impacts to vegetation are ongoing.

Iluka participated in several community events in 2014 (J-A site visits, public festivals) and engaged with over 3500 local community members across those events.

The preparation for upgrading the Jacinth-Ambrosia MARP to PEPR (Program for Environmental Protection and Rehabilitation) is underway at time of reporting.

2 INTRODUCTION

2.1 Background

Construction activities on the Mining Leases (ML), Miscellaneous Purpose Leases (MPL) and Extractive Mineral Licences (EML) at Jacinth-Ambrosia (J-A) commenced in August 2008 and were completed in September 2009. Mining activities commenced in September 2009 with the pre-stripping of vegetation, topsoil and overburden and the commissioning of the Wet Concentrator Plant (WCP), Tails Storage Facility (TSF), Heavy Mineral Concentrate (HMC) storage area and Mining Unit Plant (MUP). Processing of ore commenced in November 2009. Steady state production has occurred for the whole of 2014.

2.2 Purpose

The purpose of this Mining and Rehabilitation Compliance Report (MARCR) is to meet reporting conditions associated with the granting of mineral tenements and authorisation of activities on these tenements under the *Mining Act 1971*, as identified below.

Specifically, this MARCR addresses compliance with Mining and Rehabilitation Program (MARP) commitments for mining operational activities on the mining leases, miscellaneous purposes licenses and extractive mineral leases:

- ADP 2009/04 - Jacinth-Ambrosia Mining and Rehabilitation Program (MARP) for ML 6315, EML 6316, MPL 110, MPL 111.
- ADP 2008/021 - MARP for Extractive Mineral Leases EML 6325 – 6326, EML 6330 – 6334.

This report encompasses the reporting period 1st January 2014 to 31st December 2014.

2.3 Exclusions

Compliance reporting for the following documents is excluded from this report:

- Jacinth-Ambrosia Project Ooldea Road North and Ooldea By-Pass - Rehabilitation Plan, July 2008
- Jacinth-Ambrosia Project Ooldea Road North and Ooldea By-Pass – Environmental Management (Construction) Plan, Appendix A Dust Management Sub-Plan, July 2008, and
- Pre-construction feasibility activities carried out on Exploration Leases.

3 DESCRIPTION OF MINING ACTIVITIES

A summary of the mining project and responsibilities is provided in Table 1.

Table 1 Details of mining project

Descriptor	Details
Mine	Jacinth-Ambrosia
Tenement numbers	Mining Lease (ML) 6315 Extractive Mineral Lease (EML) 6316, 6325, 6326, 6330, 6331, 6332, 6333, 6334, Miscellaneous Purposes Licence (MPL) 110, 111
Mine owner and operator	Iluka Resources
Person accepting responsibility for the report	Dan McGrath – Manager Eastern Operations
Reporting period for the report	1 January to 31 December 2014

3.1 Mining Activities 2014

A summary of mining activities in 2014 (ore, overburden and heavy mineral concentrate movement) are provided in Table 2.

Table 2 Mining Summary for Jacinth-Ambrosia, 2014

Material	Tenement	Quantity
Ore Treated	ML 6315	7,989.2 kt
Overburden	ML 6315	1,407 KBCM [1]
HMC – Produced	ML 6315	505.6 kt
HMC – Shipped	ML 6315	436.9 kt

All heavy mineral concentrate (HMC) was shipped via the Port of Thevenard to downstream processing plants at Narngulu (WA) and Hamilton (VIC).

[1] BCM – bulk cubic metres

4 ORE RESERVES AND MINE LIFE

Updated ore reserves for the Eucla Basin (inclusive of Jacinth-Ambrosia), measured, indicated and inferred mineral resources are summarised in Table 3.

Table 3 Jacinth-Ambrosia Ore Reserves (JORC Status, as of 31 December 2013) [2]

JORC Status (as at 31 Dec 2013)	**Ore (Mt)**	**HM In-Situ (Mt)**	**HM Grade (%)**	**Zircon (%)**	**Ilmenite (%)**	**Rutile (%)**
Reserve - proved	110.6	4.57	4.1	51	27	4
Reserve - probable	3.9	0.09	2.2	52	20	4
Total	**114.6**	**4.66**	**4.1**	**51**	**27**	**4**

* Adapted from Iluka Resources Ltd ASX Release, 18 March 2015

[2] Competent Person – Ore reserves; C Lee (MAusIMM)

5 REHABILITATION AND ENVIRONMENTAL MANAGEMENT ACTIVITIES

5.1 Iluka Environmental Management Systems

Jacinth Ambrosia maintained an EHS Management System in 2014; internal compliance audits against the Iluka EHS Standards (Table 4) were completed in November 2014.

Table 4 Iluka EHS Standards (EHS Management System)

EHS Standards	Content
01 – Risk & Hazard Management	Take 2's, JHA's and SWI's
02 – Stakeholder Relations	Stakeholder identification and consultation
03 – Training & Awareness	Employee induction, training and development
04 – Contractor Management	Contractor EHS pre-qualification & induction
05 – Design, Construction & Operations	Project / infrastructure design risk management
06 – Process Safety	Process risk management, safety engineering best practice
07 – Environmental Management	Aspect/impact risk assessment and control Plans, procedures, monitoring and review Licences and approvals, training & awareness
08 – Rehabilitation & Closure	Rehab and closure risk assessment and control Rehab planning and closure criteria
09 – Carbon & Energy	Identification of energy/emissions sources Aspect/impact risk assessment and control Monitoring and regulatory reporting
10 – Radiation Management	Health and environmental risk assessment Plans, procedures, monitoring and review
11 – Workplace Health & Hygiene	Occupational health risk assessment, monitoring, health surveillance and management
12 – Incident Reporting & Investigation	EHS incident and hazard reporting (LCC's) Incident investigation (ICAM)
13 – Emergency & Crisis Preparedness	OHS, environmental and process emergencies EHS Emergency Response Plan
14 – Auditing & Assurance	Inspection, internal and external audit

5.2 Incident Reporting

Iluka personnel and contractors reported 323 environmental incidents (actual and potential environmental impact) via the Iluka Lost Control Card (LCC) reporting system in 2014 (Table 5). A discussion of incident trends and outcomes is provided in Section 6.0. Incident summaries, where applicable to assessment criteria, are provided in Appendix A.

Table 5 Summary of environmental incidents and applicable MARCR section

Category	No. of Incidents	MARCR Section
Flora	5	Section 6.1
Fauna	65	Section 6.2
Pest plants and animals	2	Section 6.3
Indigenous / non-Indigenous heritage	0	Section 6.4
Soil	0	Section 6.5
Surface water quality	3	Section 6.6
Groundwater	0	Section 6.7
Dust & air quality	7	Section 6.8
Solid waste	39	Section 6.9
Hydrocarbon & chemical storage	156	Section 6.10
Public safety	46	Section 6.11
Total environmental incidents	**323**	

The number of incidents reported in 2014 increased by 24% from 2013. This is attributed to several factors including:

- Continued improvement in environmental incident awareness and reporting in line with Iluka's 'proactivity' initiative;
- An increased number of roadkill events associated with the resumption of normal haulage; and
- The inclusion of hazard and near miss reports associated with 3rd party traffic and pedestrian activity between the J-A operation and Ceduna. These events had not been reported in previous compliance report statistics.

5.3 Rehabilitation Summary

This section presents a summary of 2014 rehabilitation activities and proposed works for 2015. Data is reported by domain and sub domain, as per the J-A MARP Mine Closure Plan.

- Domain 1: Ooldea Rd (not reported through MARCR, figures displayed in this report for record only).
- Domain 2: MPL111 Airfield & Village
- Domain 3: MPL110 Borefield & Access Rd
- Domain 4: ML6315 Mine Site

The disturbed and rehabilitated areas for the MARCR reporting area (Domains 2, 3 & 4) are summarised in Table 6, the locations of which are displayed in Figure 1.

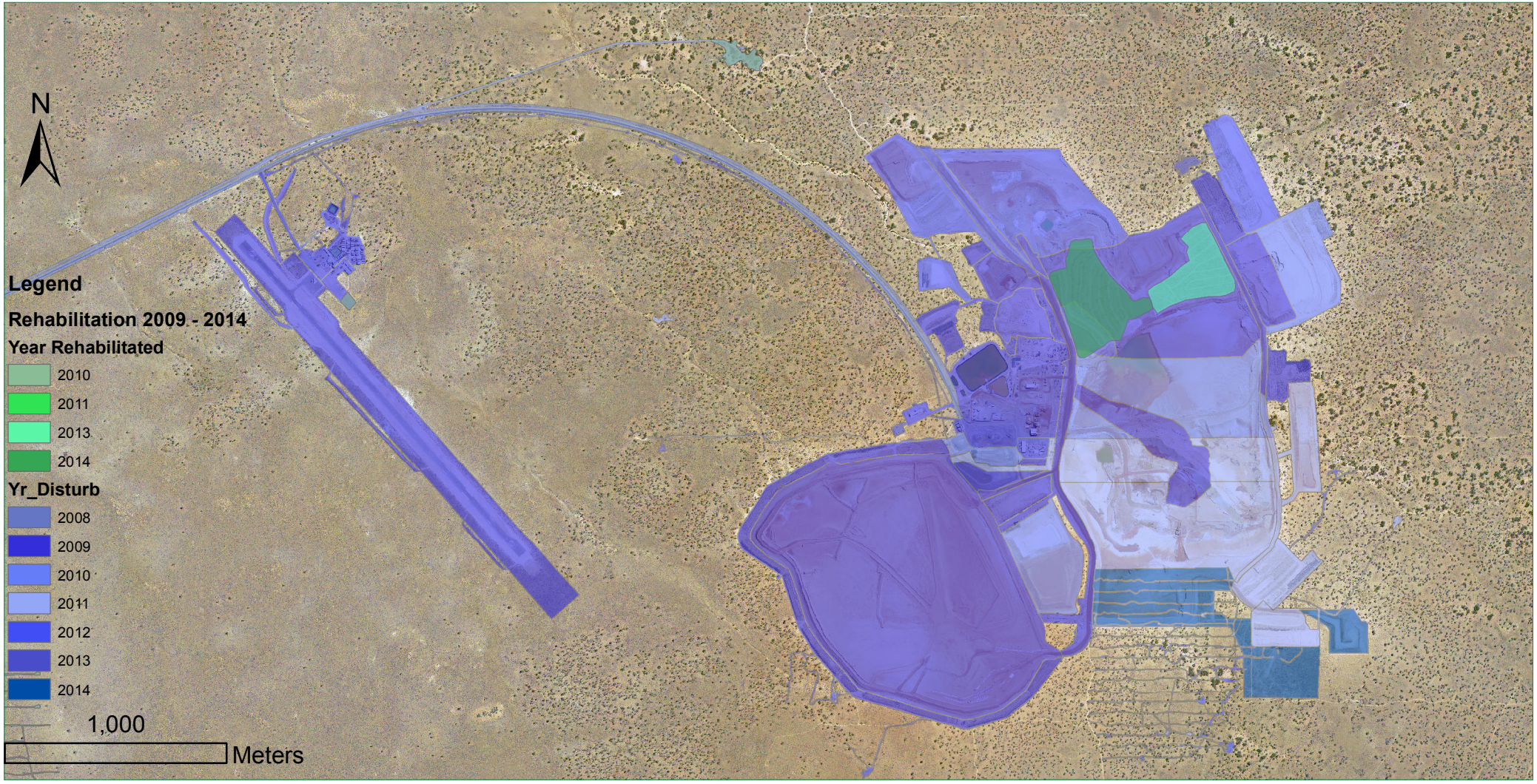
In 2014, a total area of 28.5 ha was cleared and stripped of soil in accordance with the Jacinth Ambrosia Vegetation Removal and Soil Management Procedure, PRC 5061. A total area of 12.3 ha was reinstated for rehabilitation.

Table 6 Disturbed and rehabilitated areas for 2014 reporting period

Domain	2008-2013		2014		2015	
	Previous Reporting Periods		Current Reporting Period		Proposed Next 12 Months	
	Disturbed (ha)	Rehab (ha)	Disturbed (ha)	Rehab (ha)	Disturbed (ha)	Rehab (ha)
Domain 1: Ooldea Rd[3]						
A Borrow Pits	*93.6*	*59.22*	-	-	-	-
B Water Points	*2.8*	*0.2*	-	-	-	-
C Ooldea Rd (actual rd area 155.7 ha)	*0.7*	-	-	-	-	-
Subtotal	*97.1*	*59.42*	-	-	-	-
Domain 2: MPL 111 Airfield & Village						
A Airfield	40.1	-	-	-	-	-
B & C Village	10.5	1.7	-	-	-	-
Subtotal	50.6	1.7	-	-	-	-
Domain 3: MPL110 Borefield & Access Rd						
A, B, D Infrastructure	105.1	-	-	-	-	-
C Turkey's Nests, Bores	12.46	3.8	.-	-	-	-
E Tank Farm 1	3.0	-	-	-	-	-
F EML's, Borrow Pits	14.2	5.4	*1.8*	-	-	-
Subtotal	134.76	9.2	1.8	-	-	-
Domain 4: ML6315 Mine Site						
A Jacinth Pit	156.0	-	14.4	12.3	27.47	-
B Ambrosia Pit	-	-	-	-	-	-
C Tailings Storage Facility (inc. stockpiles)	108.7	-	-	-	-	-
D Soil Stockpiles	116.59	-	10.7	-	15.5	-
E, F, G, H Infrastructure	56.6	-	1.5	-	-	-
Subtotal	437.2	-	26.7	12.3	42.97	-
Total Area (exc. Domain 1)	**622.10**	**10.9**	**28.5**	**12.3**	**42.97**	**-**

NB: Small areas will vary between domains over the years as the sub domains change, i.e. from in-fill drilling to become pit or haul road.

[3] *Domain 1, Ooldea Rd data is not reported on within the PEPR, displayed here for information only*



J-A

Disturbed and Rehabilitated Areas 2014
Domain 2 (Airfield and Village) and Domain 4 (Mine Site)

ILUKA

ORIG: JLEE DRAWN: JLEE SCALE: 1:25,287 (A4) DATE: 28/03/2015 DWG No: MARCR Fig.3

FIGURE: 1

5.4 Rehabilitation Progress 2014, Plans 2015

Rehabilitation earthworks in Cell 1 are now complete with another 12.6 ha finalised in June 2014. Rehabilitation of Cell 1 now totals 21 ha with vegetation becoming well established, particularly in the area completed in 2013.

The transfer of tailings into the Cell 2 pit void was completed in October 2014 with reshaping earthworks commencing in late November 2014. Final planning is currently underway for the design of creek and dune features that will be reinstated in this area in 2015. Please note that historical clearance and rehabilitation, by year, is illustrated in Figure 1.

Rehabilitation activities completed in 2014 and planned activities for 2015 are summarised for each domain in Table 7.

Table 7 J-A Rehabilitation Summary

Domain	Size (ha)	Progress in 2014	Planned for 2015
2 Airfield & Village			
2B, Canberra Camp	1.4	Germination of natives in some areas, however some small areas still compacted and had no growth. Some weed control required. Refer to Plate 1 and Plate 2	Old septic system and pipe still to be removed. Some compacted areas will need to be ripped. Weed control as necessary. LFA: 2011, 2012, next scheduled 2015.
2B, Contractor Camp	1.51	Germination of natives in some areas. No weed control was required in this area. Refer to Plate 3 and Plate 4.	Weed control as necessary.
3 Borefield and Access Road			
3C, Borefield Turkey's Nests	3.76	Very little germination has occurred in this area. No weed control was required in this area.	Weed control as necessary. Low level ripping and hand seeding planned for this area in 2015. LFA: Scheduled for 2014, 2015 and 2018.
3E, Tank Farm 1	3.02	Very little germination has occurred in this area. No weed control was required in this area. Refer to Plate 5 and Plate 6	Weed control as necessary. Low level ripping and hand seeding planned for this area in 2015. LFA: 2011, 2012, next scheduled 2015.

Domain	Size (ha)	Progress in 2014	Planned for 2015
3F, Borrow Pit, EML 6325	2.36	Very little germination has occurred in this area. No weed control was required in this area.	Weed control as necessary.
4 Mine Site			
4A, Jacinth Mine Area, Cell 1 East	7.5	Rain events in the first half of 2014 encouraged plant growth and many of the more mature plants showed evidence of seed development which will assist in increasing the seed bank in the soil (Plate 7) The annual monitoring conducted using both Jessop transects and quadrat surveys indicated similar species diversity and plant abundance to 2013 with one new grass species recorded *Austrodanthonia caespitosa* (common wallaby grass). Some erosion management was conducted to repair areas that had developed rills during a heavy rain event in February (50mm in 3hrs). This repair work has held up well in subsequent rain events. Weed management has included the treatment of wards weed, turnip weed, milk thistle and sow thistle.	Continued monitoring in 2015 will determine the extent of follow up seeding/planting that will be required to ensure appropriate vegetation community composition. Weed control as necessary. Erosion management where necessary.
4A, Jacinth Mine Area, Cell 1 West	12.6	Topsoil of Cell 1 West was established in a similar manner to that of Cell 1 East to allow confirmation and comparison of results received in the previous trials. (Plate 8). The trial bays compare: • The growth response of different aged topsoils i.e. direct return, one year old and four year old topsoil and subsoil stockpiles • Soil replacement techniques (carry grader or paddock dumping/dozer push) • Direct seeding vs natural soil seed bank regeneration. A riparian zone has been reinstated within this area and has been designed as per recommendations provided by Alluvium Consulting as part of their *Jacinth Ambrosia Watercourse*	Continued monitoring in 2015 will determine the extent of follow up seeding/planting that will be required to ensure appropriate vegetation community composition. Weed control as necessary. Erosion management where necessary.

Domain	Size (ha)	Progress in 2014	Planned for 2015
		Rehabilitation Final Functional Design Report (2013). The rehabilitation activities completed in this area are detailed in the *Jacinth Ambrosia Landform Restoration Implementation Plan 2014* and *Revegetation Implementation Plan 2014* both internal Iluka management plan, available upon request.	
4A, Jacinth Mine Area, Cell 2	35	Cell 2 is located south of Cell 1. The transfer of mine tailings was completed in October 2014. After allowing for suitable drainage to occur the reshaping of the Cell to meet topography requirements commenced. This area will include the continuation of the riparian zone that runs to the west of Cell 1 and will also include dune features and a myall/mallee habitat to the east of the Cell.	Finalise reshaping of tails to final landform design. After confirmation that the phreatic zone is at a suitable depth below tails surface, earthworks will commence to reinstate the red loam profile. This is likely to continue up until the end of 2015 with the remaining soil profile being reinstated in 2016.

Plate 1 Canberra camp site 2009

Plate 2 Canberra camp site 2013

Plate 3 Lucas camp site 2011

Plate 4 Lucas camp site 2013

Plate 5 Tank farm 2009

Plate 6 Tank farm 2013

Plate 7 Rehabilitation in Cell 1 East with prolific plant growth evident

Plate 8 Rehabilitation of Cell 1 West

5.5 Seed Collection Program

The J-A Native Seed Store currently contains a collection of 66 species from 20 families (Appendix A, Table 1). Active collection of seed in 2014 assisted in increasing stock of species already contained within the database including spear-grass seed (*Austrostipa nitida*), bladder salt bush (*Atriplex vesicaria*), silver mulla mulla (*Ptilotus obovatus*) and umbrella wattle (*Acacia oswaldii*).

Seed was collected from undisturbed areas of the mine lease as well as from roadsides, creeks and areas scheduled for clearance. Collection was by rehabilitation staff with support from casual Indigenous employees from Ceduna.

5.6 Rehabilitation Research and Monitoring Program

In 2014 the current research and monitoring programs at J-A were reviewed and priorities and programs reassessed based on current information. The J-A Research and Monitoring Plan (RAMP) was subsequently prepared. The J-A RAMP outlines the anticipated research and monitoring programs to be carried out at J-A in 2014/2015. Results from the RAMP programs will be provided in the 2014/2015 Jacinth Ambrosia Research and Monitoring Summary (JARMS).

A summary of the RAMP programs and aims is provided in Table 8.

A summary of completed research carried out at J-A is provided in Table 9 and provided in full in the 2012/2013 JARMS.

Table 8 Summary of the J-A RAMP 2014-2015 program

Program	Aims
Spatial distribution of roots and soil characteristics	To assess the vertical and horizontal root distribution of key species and correlate root density and distribution with soil profile and soil water properties.
Hydraulic redistribution by western myall	Investigate whether deep-rooted species at J-A utilise hydraulic redistribution.
Pot trials (western myall)	To investigate rooting requirements of the western myall trees and the ability of western myalls to cope in saline conditions.
Cell 1 trial	• To examine rooting requirements of *A. papyrocarpa*, *E. oleosa* and *E. gracilis*. • To investigate the plant water use of J-A deep rooted species - *A. papyrocarpa*, *E. oleosa* & *E. gracilis*. • To compare changes in soil chemical and physical characteristics as a result of disturbance.
Pot trial (mixed species)	To investigate rooting requirements of various shrubs and grasses and their ability of to cope in saline conditions.
Dune and creek characterisation	The aims of the dune and creek characterisation study is to: • Determine depth of sand at the dune and creek features; • Verification of accuracy of using historical drill hole logs to determine depth of sand; • Verification of accuracy of excavation techniques to determine sand depth; and • Identify and describe vegetation associations at creek and dune features and in association with various sand depths.
Farming of topsoil through dilution	Determine if additional topsoil could be farmed by spreading diluted topsoil over an underlying substrate (brown loam or subsoil) and allowing the biological crust and soil seed-bank to develop over time.
Manufacture of topsoil from brown loam overburden	Determine the potential to manufacture topsoil from subsoil and/or brown loam suitable for rehabilitation purposes through the addition of BSC and seed.
Germination of recalcitrant vegetation species	Investigate methods to stimulate germination in species that do not germinate readily from the soil seed bank or direct seeding.
Efficacy of rehabilitation techniques	Investigate the: • Impact of soil storage in stockpiles on seed bank and germination rates. • Impact of different soil returns methods on seed bank and germination rates. • Identify methods to alleviate compaction in areas of water flow without increasing erosion risk (for riparian areas).
Propagation of recalcitrant species	Overall this program aims to: • Investigate the potential (success rates) for propagation of *A. oleifolium* (and *L. australe* if deemed necessary) from root cuttings. • Investigate the potential (success rates) for propagation of *M. sedifolia* from cuttings
Translocation of recalcitrant species	Determine the suitability of translocation as a means of recruiting recalcitrant species.

Program	Aims
Maireana sedifolia seed production	Develop a method of producing viable seed using resident *M. sedifolia* plants that can then be used for onsite rehabilitation activities.
Capillary break verification	To provide field verification of the capillary break modelling outcomes, i.e. no capillary break required.
Soil water and salinity movement	To monitor the movement of soil water and salinity through the various soil profile treatments, including wetting front identification.
Rehabilitation monitoring	Determine the functionality of the rehabilitated areas over time.
Impacts of mining dust on surrounding vegetation	Determine any changes in abundance, composition or condition of vegetation against control site or background data to identify any impacts to vegetation due to dust smothering. Determine the mechanisms of impact for the long lived species *Maireana sedifolia*
Impacts of mounding saline groundwater on surrounding vegetation	Determine the susceptibility of various vegetation species to rising groundwater (due to mounding)
Stockpile Monitoring	Provide information on the expected: • Germination rates of vegetation species; and • Successional changes of BSC over time.

Table 9 Summary of completed research programs

Program	Year	Aims	Collaborations
Completed			
What is the minimum soil profile depth and characteristics to sustain Western Myall and their associated plant communities	2011-2012	• To investigate the spatial distribution of roots and how this relates to soil characteristics for key plant species at J-A. • To examine the sources of soil water used by key plants species and characterise their plant-soil-water relationships. • To determine the responses of key species to water availability and increased salinity in natural and reconstructed soil profiles.	University of Adelaide
Salinity effects on germination and seedling growth of key species in a chenopod shrubland.	2012	• To study the germination response of seeds of four arid zone species to salinity and water stress. • To investigate seedling emergence performance in salinity. • To determine if the seedlings can internally regulate osmotic potential • The overall aim is to determine whether seed germination differs in plant from saline areas to less saline areas.	University of Adelaide
Investigating Seed Ecology Dynamics of Plant Species Native to the Jacinth/Ambrosia	2007-2010	• Undertake a detailed assessment and review of past restoration practices, with specific focus on those relevant to the Yellabinna region, and evaluate elements	University of Adelaide, Botanical

Program	Year	Aims	Collaborations
Mineral Sands Deposit		likely to provide 'fast-track' research options for the project; • Undertake a detailed study of the seed dormancy and germination requirements of the foundation plant species; • Initiate propagule collection from plant species identified as threatened or endemic, and commence research to understand seed biology, germination and storage requirements of the identified species; • Instigate plant establishment trials including seeding and planting of dominant species under a range of test regimes with specific consideration on the effect that the proposed mining processes will have on soil substrates; • Assess size and composition of soil seed banks and sustainability of species in natural communities; • Prepare recommendations in relation to topsoil storage during mining and substrate reconstitution post-mining; • Provide plant species establishment guidelines for Iluka Resources Ltd personnel to use in the restoration of sand mine pits within Yellabinna region.	Gardens of South Australia
Restoration Technology Project	2010-2013	Seed viability and germination after storage; seed longevity; effect of saline bore water on germination and growth; seed and seedling images and fact sheets; viability of Myall seed after development under one year of elevated groundwater conditions	Botanical Gardens of South Australia
Biological Soil Crusts at Jacinth Ambrosia Mine; can they be used to improve ecosystem rehabilitation outcomes?	2010	Survey of crust types and initial experiments with recovery from disturbance.	University of Queensland
J-A Characterisation and growth of cyanobacteria from intact and disturbed biocrusts	2011-2012	• Examine the contribution of biocrusts to soil ecosystem function. • Identify cyanobacterial community structure. • Investigate biocrust recovery following disturbance."	University of Queensland
Activity of cyanobacteria in stockpiles at the J-A mine	2012	Assess if cyanobacteria can survive burial at depth in topsoil stockpiles."	University of Queensland
Investigating the role of biocrusts in weed germination	2012	To assess if there is a correlation between biological soil crusts and weed germination	University of New South Wales
Root mapping of JA vegetation	2011	To provide an indication of root depth and soil types that roots grow through in Jacinth pit.	

6 COMPLIANCE WITH OUTCOMES

This section reports on compliance against the lease conditions and the environmental and socio-economic outcomes prescribed in the Mining and Rehabilitation Plan (MARP). Each section describes the measurement criteria and provides a summary of the data supporting the compliance statement.

Selected raw data is supplied in the Appendices, and where not supplied can be made available upon request.

6.1 Flora

Table 10 Summary of compliance outcomes for flora

ML & MPL MARP Outcomes	Criteria	Monitoring Details	Compliance
All clearance of native vegetation is authorised under appropriate legislation.	Demonstrate that actual clearance boundaries are within authorised clearance boundaries (output from GIS).	Annual Biological Survey – Monitor changes in abundance, composition or condition against control sites or background data to identify changes outside approved clearance boundaries. Visual observation (during clearing activities) to ensure clearance boundaries are maintained. Visual observation (as required – e.g. in event of a spill) to ensure clearance boundaries are maintained.	Compliant
No uncontrolled fires caused by mining operations.	Demonstrate that actual clearance boundaries are within authorised clearance boundaries (output from GIS).	Annual Biological Survey – as above. Visual observation (as required – e.g. in event of a fire) to ensure clearance boundaries are maintained.	Compliant

6.1.1 Measurement of compliance

Clearance within authorised boundaries

Iluka reconcile survey clearance data with an aerial photograph and calculate the difference between clearances permitted through the Vegetation Clearance Procedure and actual clearance as a measure of compliance to procedures.

Uncontrolled fires

Iluka use the Loss Control Card reporting system to record incidents of uncontrolled fire.

Incident reporting

Iluka personnel report flora related incidents using the Loss Control Card reporting system.

Flora monitoring

Iluka via contractor Ecological and Biodiversity Services (EBS Ecology) conduct annual flora surveys to determine the effects of operations on flora for three community types (Myall/Mallee woodland, chenopod shrubland and Myall woodland).

6.1.2 Summary of key measurements

Clearance within authorised boundaries

Authorised clearance permits totalled 36.1 ha with actual clearance of 28.5 ha (Table 11). Vegetation clearance in 2014 was associated with mining activities predominantly within the pit boundary or adjacent areas for soil stockpiling (Domain 4).

Vegetation clearance in 2014 also occurred in Domain 2 (village and aerodrome, 0.01 ha) and Domain 3 (borefield and boreline, 2.33 ha). Disturbance at the borefield and boreline was associated with the boreline pigging project.

The total clearance at Jacinth for the five year period to 2014 is 650.6 ha, 53.5 ha less than the clearance endorsed through the Jacinth Vegetation Clearance Permit System.

Table 11 Vegetation clearance totals (permitted vs. actual) 2008 - 2014

	Area Cleared (ha)		
	2008 - 2013	**2014**	**TOTAL**
Vegetation Clearance Permits (ha)	668.0	36.1	**704.1**
Actual Disturbance (ha)	622.1	28.5 [4]	**650.6**
Difference, Permitted vs. Actual (ha)	**(45.9)**	**(7.6)**	**(53.5)**

Uncontrolled fires

Iluka report no uncontrolled fires resulting from mining operations for 2013.

[4] From Table 6 – Rehabilitation Disturbed and Rehabilitated Areas

Incident reporting

There were no incidences of non-approved clearance or disturbance beyond approved lease boundaries during the reporting period.

Five (5) failures of internal procedural controls designed to minimise disturbance footprint occurred during the 2014. All incidents occurred within lease boundaries and active mine areas, and represented an internal breach of the Iluka JA vegetation clearance permit system only (minor earthmoving equipment disturbance outside pegged clearance boundaries during clearance and topsoil removal). All instances of non-approved disturbance impact were surveyed for inclusion in clearance and significant environmental benefit (SEB) reporting. The Vegetation Clearance Procedure was reviewed and updated.

In 2014, Iluka rehabilitated two areas of vegetation clearance breaches associated with a non-approved wind mast installation (Plate 9) and drill-rig access track installation (Plate 10 and Plate 11) that occurred beyond mine lease boundaries in 2013 (refer Iluka J-A 2013 MARCR). Rehabilitation outcomes were reported to the DEWNR Native Vegetation Council.

Plate 9 Wind mast clearance area rehabilitation, 2014

Plate 10 Access track rehabilitation, 2013

Plate 11 Access track rehabilitation, 2014

Flora surveys

Iluka have contracted EBS Ecology since 2009 to conduct annual flora monitoring programs at Jacinth, with the aim of establishing an accurate understanding of the impacts of mine operations on native vegetation. Data from control sites (greater than 5 km from the impact zone surrounding the mine) and impact sites is used to determine trends in flora diversity and abundance. The program also aims to assist future rehabilitation work by developing an understanding of typical vegetation community structures and compositions and how these respond over a range of seasonal conditions. The survey team employs methods outlined in the Guide to the Native Vegetation Survey Using the Biological Survey of South Australia (EBS, 2014).

Overall the results of the 2014 survey do not show any adverse effects to the vegetation communities due to mining operations. Impact sites display similar trends as control sites. Given that the monitoring has been carried out over a six year period any adverse impacts on vegetation resulting from mining operations would likely have been identified from the data set.

The 2014 field survey was conducted between 12 – 17th November (report available upon request). Highlights of the survey included:

- Results for 2014 showed an increase in species richness of perennial species at both control and impact sites. The vegetation appeared to be in good health most likely due to heavy autumn rains. The current survey recorded the highest total number of species for all sites across the entire monitoring period (2009 – 2014).
- Abundance of perennial species increased at chenopod sites but either remained steady or decreased at myall and mallee sites. Chenopod sites that had recorded low abundance in the 2013 survey were showing recovery. Low abundance at myall and mallee sites may be due to the continued senescence of a large number of baldder saltbush.
- A comparison of photopoint monitoring over the 2009 – 2014 period shows the transitional change from annual growth flushes with *Austrostipa nitida* (Balcarra spear-grass) as the most commonly noticed change in images. Small changes in bladder saltbush leaf cover were noted in some years but only a slight change in condition.
- No species of conservation significance were recorded during the survey period within the monitoring plots.

6.2 Fauna

Table 12 Summary of outcome criteria for fauna

ML & MPL MARP Outcomes	Criteria	Monitoring Details	Compliance
There are no net adverse impacts from the site operations on native fauna abundance or diversity in the lease area and in adjacent areas.	Fauna diversity and abundance trends to be consistent with impact zone expectations (as per the *Fauna Management Plan*). Fauna recovery during habitat re-establishment post closure to be consistent with baseline data and control site trends (as per the *Fauna Management Plan*)	Annual Biological Survey – Monitor fauna distribution (numbers and species) in lease and surrounding areas per the *Fauna Management Plan*. For each identified impact zone: Habitat assemblage, fauna species likely to occur, feral animals, linkages between fauna and vegetation communities. Visual observation – Significant fauna sightings on site and occurrence of injured or dead fauna.	Compliant
All sick and injured fauna must be managed as per the requirements of the Prevention of Cruelty to Animals (Animal Welfare) Act 1985.	Records indicating compliance with the requirements of the Prevention of Cruelty to Animals (Animal Welfare) Act and Regulations Demonstrated that fauna management procedures are consistent with the Act	Visual observation – Significant fauna sightings on site and occurrence of injured or dead fauna.	Compliant

6.2.1 Measurement of compliance

Fauna diversity and abundance

Iluka conducted the annual biological fauna survey in November 2014 to determine the effects of mining operations on fauna. Trends in fauna diversity, abundance and recovery cannot be determined based on current data.

Significant fauna observations

Observations of significant fauna are recorded through annual survey/reporting and within the J-A Fauna Sightings Register.

Fauna management, welfare and incident reporting

In accordance with the Jacinth-Ambrosia Fauna Management Plan and Procedure Iluka maintained records of all fauna fatalities, injuries, relocations, rescues and interactions using

the LCC system to demonstrate compliance with the Prevention of Cruelty to Animals (Animal Welfare) Act.

6.2.2 Summary of key measurements

Fauna diversity and abundance

Iluka have contracted EBS Ecology since 2009 to conduct annual fauna monitoring programs at Jacinth. This monitoring aims to assess the potential impact of mine operations on local fauna populations, and to generate a dataset to assist the generation of mine closure criteria. Data from control sites (greater than 5 km from the impact zone surrounding the mine) and impact sites will be used to determine trends in the abundance of the species present, and classify which species can be considered permanent residents, and which species can be considered transients. An additional aim of the program is to document typical fauna community structures, including species diversity, community composition, and habitat requirements of fauna, to assist rehabilitation work programs.

Overall mining operations do not appear to have any adverse impacts on fauna community species richness or abundance. The response by species is varied across all survey sites and years monitored. This is as anticipated as factors relating to changes in species richness and abundance is often complex and generally driven by climatic conditions in arid environments.

The 2014 field survey was conducted between 11 – 22nd November targeting mammals, reptiles, birds and invertebrates. The survey followed standardised techniques at eight established trapping, bat and bird sites, four additional bird survey sites, four additional bat sites and four spotlighting sites. A copy of the EBS report is available on request.

Due to the preliminary nature of this work only species diversity summaries are presented as highlights from the 2014 survey:

- **Terrestrial Mammals**: Three native and two exotic terrestrial mammal species representing four families were recorded during the November 2014 survey, either through captures, opportunistic sightings or Anabat recording. No spotlight surveys were conducted during the 2014 survey due to windy conditions. The spotlight surveys have historically had few observations recorded and are unlikely to be continued in future surveys.
- **Bats**: Four bat species were recorded with certainty due to distinguishable calls on the Anabat. No species of conservation significance were recorded. All calls were recorded within the myall woodland control and impact sites, no calls were recorded at any of the control or impact sites located within the chenopod shrubland. No harp traps were utilised during the 2014 survey due to excessively windy conditions.
- **Reptiles**: Thirty two reptile species were trapped or observed opportunistically during the November 2014 monitoring survey. One new species, the Gwardar, not previously recorded during the surveys was observed opportunistically crossing a track. This is also the first record of the species within the Yellabinna Regional Reserve. No reptile species of national or state conservation significance were recorded.
- **Birds**: Thirty native bird species, and no exotic species, were recorded during the November 2014 survey through survey observations, spotlight observations and opportune observations. This included four species under the NPW Act namely, the peregrine falcon (*Falco peregrinus*); wood sandpiper (*Tringa glareola*); Australian

bustard (*Ardeotis australis*) and the slender-billed thornbill (*Acanthiza iredalei iredalei*) and two listed as migratory under the EPBC Act including the wood sandpiper and the rainbow bee-eater (*Merops ornatus*).

- Seven fauna species were recorded during the fauna surveys for the first time, these were the gwardar (*Pseudonaja mengdeni*); peregrine falcon; wood sandpiper; Eurasian coot (*Fulica atra*); masked lapwing (*Vanellus miles*); great egret (*Ardea alba*) and the grey teal (*Anas gracilis*).

  The peregrine falcon and wood sandpiper are both listed as rare under the NPW Act, and the wood sandpiper is also listed as a migratory species under the EPBC Act.

- **Invertebrates**: Over 7,542 invertebrate specimens collected during the November 2014 survey were identified to an appropriate level. The survey results are not used to compare control and impact sites and are rather a tool for collecting baseline invertebrate data for the area.

Significant fauna observations

During the annual bird surveys four species listed under the NPW Act namely, the peregrine falcon (*Falco peregrinus*); wood sandpiper (*Tringa glareola*); Australian bustard (*Ardeotis australis*) and the slender-billed thornbill (*Acanthiza iredalei iredalei*) were observed. The wood sandpiper is also listed as migratory under the EPBC Act as is the rainbow bee-eater (*Merops ornatus*) that was also observed.

Fauna management, welfare and incident reporting

In 2014 Iluka personnel and contractors submitted 64 x LCC reports concerning native fauna interactions within the mine area, village, borefield, Ooldea Road and other areas within the boundaries of the Iluka ML, MPL and EML's. These 64 LCC reports involved 105 fauna individuals as summarised in Table 13.

Table 13 Native fauna incidents summary, 2014

Incident Type	LCC Records	# of Individuals Impacted
Deceased – unknown cause	10	10
Drowned	5	32
Rescued	1	1
Road kill	48	62
Total	**64**	**105**

Consistent with all previous reporting years, road kill (48 LCC's – 62 individuals) represented the greatest impact to fauna in 2014 however the number of individual fatalities were considerably increased (up 244%) from 18 deaths last year. Wombats, followed by kangaroos, represented the majority of reported road kills. All incidents involved strikes by triple road trains along the Ooldea Road during mineral haulage between J-A and Port Thevenard.

As reported in previous compliance reports the haulage of heavy mineral concentrate (HMC) ceased during the period July 2012 – May 2013. Further, when haulage resumed in May 2013 this was at a reduced rate (average 8 road trains per day). Haulage increased to normal levels during the 2014 reporting period (average 15 road trains per day) which

accounts for the corresponding increase in road kill events. Road kills will be investigated and impact assessed to determine potential mitigation measures.

The number of fauna deaths from drowning had also increased from 2013 (up 166%) with almost all drownings (30 individuals) associated with bird access into wastewater treatment plant holding tanks. One event involving a group of trapped budgerigars accounts for the high percentage of bird individuals impacted. This issue has been addressed with the installation of aviary barrier mesh to prevent bird access. It is noted that dingo drownings declined 90% from 2013 due to a combination of fencing upgrades and reduced dingo activity during the reporting period.

Two significant species were included in the fauna fatalities. Two Australian bustard (*Ardeotis australis*) individuals – listed as Vulnerable in SA – were found deceased in separate incidents; cause of death cannot be determined but is likely the result of an unknown 3rd party vehicle strike or animal attack. A carpet python (*Morella spilota*), listed as rare in SA, was also observed 86km south of the JA mine site, it was run over but it is unknown if it was the result of mine operations or local traffic from the Yalata or Oak Valley communities. The snake species has not been recorded in the area previously and the carcass was collected for the SA Museum.

A third injured bustard, which survived a road train strike, was rescued and sent to the Adelaide Zoo for rehabilitation.

6.3 Pest Plants and Animals

Table 14 Summary of compliance criteria for pest plants and animals

ML & MPL MARP Outcomes	Criteria	Monitoring Details	Compliance
No introduction of new weeds, plant pathogens or pests (including feral animals), nor increase in abundance of existing weed or pest species in the lease area and adjacent areas caused by mining operations.	Weed species diversity and abundance at closure to be consistent with baseline data and/or control sites. Comparison of results against baseline data and/or control site(s) and implementation of weed management activities (as identified in the *Weed Management Plan*)	Opportunistic visual observations: Disturbed areas Annual Biological Surveys (native flora) Recording of pest plant species identification and locations, presence and composition of vegetation and weed infestations	Compliant
	Pest animal species abundance at closure to be consistent with baseline data and/or control sites.	Opportunistic visual observations: Disturbed areas Annual Biological Surveys (native fauna) Recording of pest animal sightings on site. Habitat, fauna species likely to occur, fauna species identified, feral animals, linkages between fauna and vegetation communities.	Compliant

6.3.1 Measurement of compliance

<u>Weed species and abundance at closure</u>

Implementation of the Iluka weed management program includes the mapping of known and new weed infestations and maintaining records when weed control is carried out. Records are maintained using GIS and weed management record sheets.

Monitoring for weeds is conducted as part of project operations and includes vehicle/equipment hygiene inspections to ensure weed infested soil and/or plant material does not enter the area; monthly inspections of disturbance areas for evidence of weed growth; sighting records within the operational area by Iluka personnel using the LCC reporting system and, annual vegetation survey areas, recorded via contractor Ecological and Biodiversity Services (EBS).

Pest animal species and abundance at closure

Pest animal observations are maintained in the J-A Fauna Sightings register. Pest animal interactions (e.g. fatalities, sickness and injury, relocations, captures) are recorded using the fauna register. General information on trends in pest species abundance and distribution within the reserve system is obtained from government sources as required.

Iluka, via contractor Ecological and Biodiversity Services (EBS), report on opportunistic observations of pest animals during annual fauna surveys. These surveys provide a comparison of mining and non-mining related impacts on native and introduced species distribution and abundance and linkages with the main vegetation associations on site (myall/mallee woodland, chenopod shrubland and myall woodland).

Incident reporting

Iluka personnel report observations of weed or pest animals to the environmental team who maintain an observations register.

6.3.2 Summary of key measurements

Weed species and abundance at closure

To ensure that weed species diversity and abundance at closure is consistent with baseline data and/or control sites Iluka has maintained an active weed management program within and adjacent to the mining lease.

The JA weed mapping and management program is prioritised on two levels:

- Location: the landscape types most prone to weed invasion are identified as the highest priority areas, this includes rehabilitation areas, soil stockpiles and areas with frequent offsite vehicle movement (Appendix B Figure 1). All weed species will be managed in these high priority areas, regardless of weed species priority.
- Weed Species: noxious weeds and weeds listed under the NRM Act are given the highest management priority this includes buffel grass, horehound, and ruby dock. These weeds will be managed across all landscape types. They will also be managed on low priority landscape types if they occur in an area that has the potential to influence mining operations, e.g. transport corridor.

2014 J-A weed diversity and distribution by domain

Weed Distribution

Weeds were recorded and managed within all three lease holds namely the airfield and village; the borefield and access road; and the mine site. Following mid-year rains management focussed on the known areas that had a tendency to collect water such as the walking track and the borefield road. These areas were managed using a vehicle mounted spray unit, which provides good spray coverage and enables a large area to be treated effectively.

Following rain events the ephemeral creeks were also inspected including creeks upstream of the mine area, which upon inspection were infested with weeds and are likely to be a source of weeds entering the mine footprint (Appendix B Figure 1). These areas will continue to be monitored as part of the weed management program.

New infestations of wards weed, wild turnip and sow thistle were recorded at vegetation stockpile 13 and topsoil stockpile 13, this is most likely from seeds transported by rabbits that are known to reside within the vegetation stockpiles, hopefully the rabbit baiting program will reduce the likelihood of rabbits acting as vectors for weeds.

No weed species were recorded at any of the survey sites during the annual flora survey conducted by EBS Ecology.

Weed Diversity

Nine weed species were recorded and sprayed/hand pulled during the year (Table 15). Of these species, horehound (*Marrubium vulgare*) was the only one not previously recorded on site and was detected within a surface water flow area. Horehound is listed as a declared plant under the NRM Act and was sprayed with glyphosate which is in keeping with the Declared Plant Policy (NRM Board, 2004) for the Alinytjara Wilurara NRM region, which states that the weed must be managed by the landholder. The area has been mapped and will be regularly inspected to ensure that the weed front does not increase.

Table 15 Weed species recorded and managed in leasehold areas 2005-2014

Weed species		Year Recorded							
Common Name	*Scientific Name*	2014	2013	2012	2011	2010	2009	2008	2005-2006
Wards Weed	*Carrichtera annua*	X	X	X	X	X	X	X	X
Turnip	*Brassica tournefortii*	X	X	X	X	X	X	X	X
Oats - domestic	*Avena sativa*					X			
London Rocket	*Sisymbrium sp*				x	X	X		
Milk Thistle	*Sonchus oleraceus*	X	X	X	X	X	X		
Barley Grass	*Hordeum sp*				x	X	X		
Wild Oats	*Avena sp*	x			x	X	X		
Iceplant	*Mesembryanthemum crystallinum*	x			x	x			
Ruby Dock	*Acetosa vesicaria*	x			x	X			
False Sowthistle	*Reichardia sp*	X	X	X	X	X	X		
Horehound	*Marrubium vulgare*	x							
Fleabane	*Conyza sp*			x	x	X	X		
Cape Weed	*Arcotheca calendula*			x	x	x			
Buffel Grass	*Cenchrus ciliaris*			x		x			
Saffron Thistle	*Carthamus lanatus*		x			x	X	X	
Blackberry Nightshade	*Solanum nigrum*					x			
Wild Lettuce	*Lactuca serriola*					x			
Rye Grass	*Lolium sp*		x		x	x			
Wild Radish	*Raphanus raphanistrum*					x			
Couch	*Cynodon dactylon*					x			
Fat Hen	*Chenopodium sp*				x	x			
Medic	*Medicago sp*		x		x	x			
Iceplant Angled	*Mesembryanthemum aitonis*				x				
Paddy Melon	*Citrullus sp*						X		
Common Heron's Bill	*Erodium cicutarium*							X	X
Brome grass	*Bromus spp.*	x	x						

Number of locations where weed species managed (this is a reflection of abundance, not an actual measure and does not apply to pre 2009 surveys): **X** = 20+ locations, X = 5-20 locations, x = <5 locations

Pest animal species and abundance at closure

Pest animal observations

Ten pest animal events were reported in 2014 (Table 16) with the majority being observations of rabbits within the vicinity of the camp.

Table 16 Pest animal events reported via Iluka personnel in 2014 [5]

Event Type	Number of Events	Pest Species
Deceased – unknown cause	3	Rabbit
Drowned	1	Rabbit
Observations	9	Camel, rabbit, cat
Road kill	1	Rabbit
Total	**14**	

EBS Ecology conducted a fauna survey at Jacinth in November 2014, which included a survey of pest animals. This year four pest animal species were recorded including the house mouse, one-humped camel, fox and European rabbit. A summary of the pest animal species observed during annual fauna surveys is provided in Table 17.

Table 17 Pest animal species observations, EBS (2006 – 2014)

Pest Species	2006 SKM	2008 EBS	2009 EBS	2010 EBS	2011 EBS	2012 EBS	2013 EBS	2014 EBS
Fox	x							x
Camel	x	x	x			x		x
Cat	x		x	x				
Rabbit	x	x	x	x	x	x		x
Mouse	x	x	x	x	x	x	x	x

Incident reporting

Iluka personnel reported 2 breaches of the Iluka vehicle and equipment hygiene procedure. One incident concerned the poor presentation of a field vehicle at the Ceduna wash down facility (vehicle denied access to site until rectified), and the other the arrival of earthmoving equipment to site without an accompanying inspection form. Both incidents were addressed with the respective contractors.

Pest Management Activities

Routine mouse baiting continued throughout 2014, and several deceased mice have been observed following bait changes.

Rabbit sightings increased late in 2013 and a 1080 poisoned oat baiting program was carried out in 2014.

Opportunistic sightings of camel were recorded during inspections of the borefield pipeline and during the annual fauna survey. Site environmental personnel continue to provide routine updates to local DEWNR rangers on camel movements and numbers.

[5] Combined records from LCC and fauna sighting register

6.4 Indigenous Heritage and Non-Indigenous Heritage

Table 18 Compliance criteria – Indigenous and non-Indigenous heritage

ML & MPL MARP Outcomes	Criteria	Monitoring Details	Compliance
No disturbance to Aboriginal artefacts or sites of significance unless prior approval under the relevant legislation is obtained	GIS figure/map demonstrating that no work/activity has been undertaken in areas for which heritage clearance has not been gained. Demonstration of compliance with regulatory requirements (through internal incident reporting procedures and requirements.	Visual identification of artefacts or sites of significance	Compliant

6.4.1 Measurement of compliance

Compliance with regulatory requirements

Sites of indigenous heritage significance are located in and around the Jacinth-Ambrosia site. Representatives of the Far West Coast Native Title Claimants surveyed and cleared all areas for Aboriginal artefacts and sites of significance and relocated several artefacts in 2009 prior to commencement of mining.

Mapping

Iluka measures compliance against Heritage & Non-Indigenous Heritage outcomes through program implementation, GIS mapping and incident reporting.

6.4.2 Summary of key measurements

Iluka reported no discoveries or disturbance to heritage sites/artefacts during the reporting period.

As noted in Section 6.1 all vegetation clearances occurred within approved clearance boundaries (Domains 3 and 4); none of the minor internal clearance breaches as reported in Section 6.1.2 impacted any areas or sites of cultural heritage significance.

Iluka maintained the site Vegetation and Heritage Clearance Procedure to ensure that heritage sites are not disturbed.

Iluka maintained a register of clearance permits, survey records and approvals to demonstrate compliance with this outcome.

6.5 Soil

Table 19 Summary of outcome criteria for soil

ML & MPL MARP Outcomes	Criteria	Monitoring Details	Compliance
Migration or infiltration of any spillage or leakage to the surrounding environment is prevented (in conformance with relevant Environment and Protection Authority guidelines). All clearance of native vegetation is authorised under appropriate legislation.	Demonstrate that facilities are designed in accordance with EPA Guidelines (via a post construction audit). Demonstrate that actual clearance boundaries are within authorised clearance boundaries (output from GIS).	Visual inspection / audit of relevant facilities	Compliant

6.5.1 Measurement of compliance

New facilities

Post-construction audit of new facilities to ensure compliance with EPA Guidelines.

Clearance within authorised boundaries

Construction or installation of facilities occurs within lease boundaries and subject to Vegetation Clearance Permit where required.

6.5.2 Summary of key measurements

No new facilities were installed at Jacinth in 2014.

NOTE:

Statistics and discussion on spill events are reported under 'Hydrocarbon & Chemical Storage' (Section 6.10 Hydrocarbon and Chemical Storage) in line with the outcomes and assessment criteria for that aspect.

6.6 Surface Water Quality

Table 20 Summary of outcome criteria for surface water quality

ML & MPL MARP Outcomes	Criteria	Monitoring Details	Compliance
The post mining ecosystem and landscape function is resilient, self-sustaining and indicating that the pre-mining ecosystem and landscape function will ultimately be achieved.	Pre-mining flow regimes are re-established post mining.	Surveys (pre-mining and post mining). Design of site surface water diversions to be surveyed to ensure design capacity and integrity is maintained. Survey to include: Stream profile and hydraulic function Ecological function	Compliant
Ecosystems are not damaged by release of contaminated water off lease	Water turbidity and EC measurements along creek lines up and downstream of lease boundary, demonstrate no release of contaminated water from operations.	Water quality – opportunistic sampling during or following rainfall events. Turbidity or equivalent (upstream and downstream of the mine site).	Compliant

6.6.1 Measurement of compliance

Pre-mining flow regimes

Creek lines and catchments, surveyed prior to commencement of mining operations, are mapped within GIS. Flow regimes will be re-established post-mining as part of mine rehabilitation and closure planning.

Two small catchment zones (north and south) feed the creek running west from Jacinth and out through the plains toward Lake Ifould. The mine pit currently terminates the creeks. The creeks do not hold or trap water for any length of time because the catchment is very small, the sandy creek bed is porous and the water flows readily out onto the plain.

Water quality

Personnel are required to sample creek flows during/after rainfall at points upstream and downstream of the lease boundary.

6.6.2 Summary of key measurements

Pre-mining flow regimes

The mine is currently active and no reporting on the re-establishment of pre-mining flow regimes is possible at this time. Studies have commenced to provide accurate assessments of pre-disturbance hydrologic and hydraulic characteristics. This information will be used to provide rehabilitation designs for waterway re-establishment and will be included in future updates of the rehabilitation plan (interim report available upon request).

Water quality

In 2014 rising stage creek samplers were installed upstream and downstream of the active mine area (Plate 12); these samplers allow automated sampling of creek ephemeral surface water flows and comparison of upstream (baseline) versus downstream water quality.

No surface water flow events occurred in 2014 which could be sampled by these units.

Plate 12 Rising stage sampler

Two (2) surface water-related incidents occurred in 2014, the washout of an earthen bund for storage of chemical intermediate bulk containers (no release off footprint) and minor sediment release from a red stockpile outside the disturbance footprint during an extended period of rainfall.

In 2014 the existing vegetation clearance permit system was amended to include assessments and controls for the management of sediment runoff and containment from disturbance areas and soil stockpiles.

6.7 Groundwater

Table 21 Summary of outcome criteria for groundwater

ML & MPL MARP Outcomes	Criteria	Monitoring Details	Compliance
The extraction and use of groundwater does not adversely affect environmental processes that are reliant on that groundwater system.	Groundwater levels/ drawdown as measured are the same or better as predicted.	Borefield: Flow meters, monthly extraction volumes Standing water levels (depth) measured quarterly Groundwater quality, bi-annually	Compliant
Groundwater systems outside of the extent of the mine workings are not altered by the disposal of process water in the pit.	Groundwater levels in areas adjacent to and surrounding the mine site do not exceed standing water levels determined to result in adverse impacts* **Standing water levels to be determined in consultation with regulatory agencies and based on surrounding groundwater environmental and vegetation associations*	Mining Lease: Standing water levels (depth) measured monthly Groundwater quality, bi-annually	Compliant

6.7.1 Measurement of compliance

Borefield groundwater drawdown

Borefield drawdown monitoring is undertaken using real-time abstraction data and monthly dip-meter readings of standing water level (SWL). A hydrogeological review of the aquifer drawdown model is undertaken annually as prescribed in the Jacinth Groundwater Management Plan.

Groundwater levels

Iluka conduct bi-annual groundwater quality chemical sampling and analyses (EC, metals, hydrocarbons and radionuclides) of borefield and mine-site groundwater bores. Mine site water levels are monitoring fortnightly (high-risk wells) and monthly (low-risk wells) in accordance with defined site-specific trigger levels (SSTL).

6.7.2 Summary of key measurements

Borefield groundwater drawdown

Sinclair Knight Merz (SKM, 2011) developed a groundwater model of the Jacinth-Ambrosia Project palaeochannel-hosted borefield in April 2011. The model was calibrated in transient mode using groundwater abstraction and head monitoring data for the period between 1 August 2009 and 1 November 2010. At the time of calibration, three monitoring wells were installed. The Visual MODFLOW (SWS, 2013) interface for MODFLOW was used to construct and run the model. For details of the hydrogeological conceptualisation and model design readers are directed to SKM (2011).

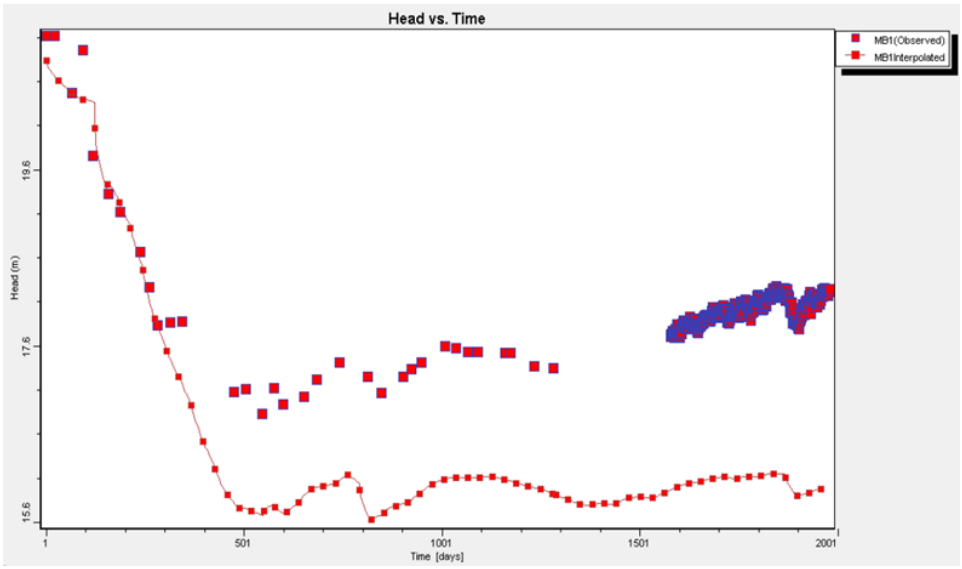
Iluka (2013) extended the SKM (2011) calibration model and verified that the calibrated model was able to produce an acceptable match to measured groundwater head data obtained from six monitoring bores distributed around the borefield. The model produced an acceptable fit to the three monitoring bores installed since the initial SKM (2011) calibration. On this basis, model predictions were not revised.

In March 2015 the calibration model was extended to include monitored borefield abstraction data up to January 2015. The model was re-run and modelled and measured hydrographs from the six monitoring wells were compared to reassess the validity of the model (Figure 2 and Figure 3). Key findings from the model re-run are:

- The trends present between modelled and measured groundwater levels at the six monitoring wells indicated that the model over-estimates drawdown compared to measured groundwater levels. This overestimate indicates the model is providing a conservative prediction of palaeochannel groundwater response to pumping. The model is to be revised and re-calibrated in 2015.

- Measured groundwater levels at monitoring wells MB1, MB3, MB4, MB5 and MB6 demonstrated a general recovery in groundwater levels since 2014. This is a result of a decline in abstraction from the borefield driven by significant improvement in mine site water recoveries.

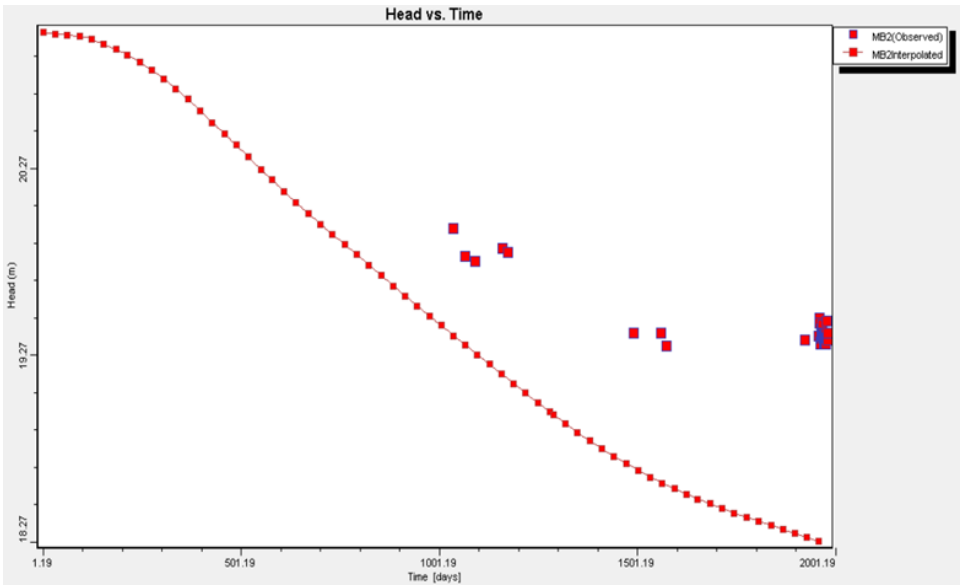
Monthly monitoring of groundwater levels at the borefield will continue.



MB01 – Modelled vs. Actual (Observed) ^

Observed levels are higher than predicted (over-prediction of drawdown)

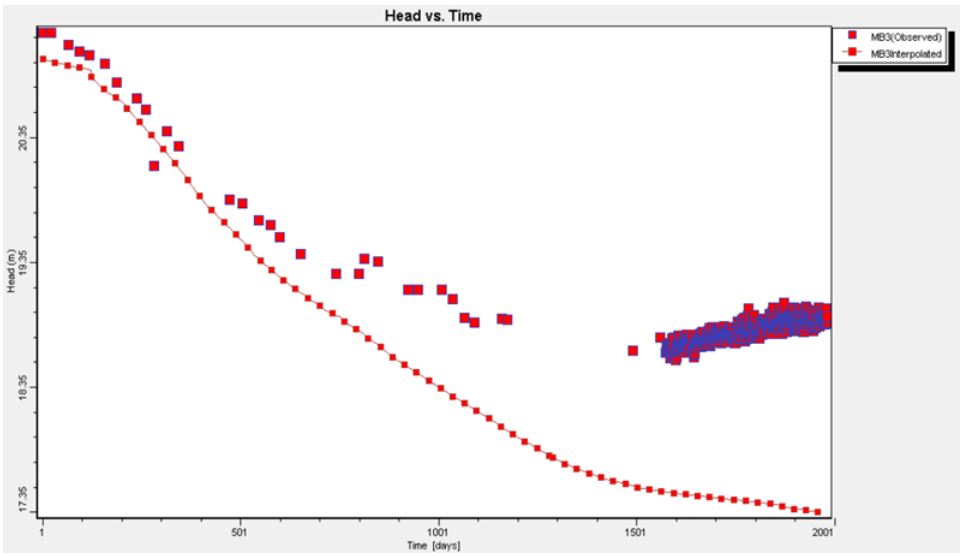
^ *Solid line = modelled*
Points = measured



MB02 – Modelled vs. Actual (Observed) ^

Observed levels are higher than predicted (over-prediction of drawdown)

^ *Solid line = modelled*
Points = measured

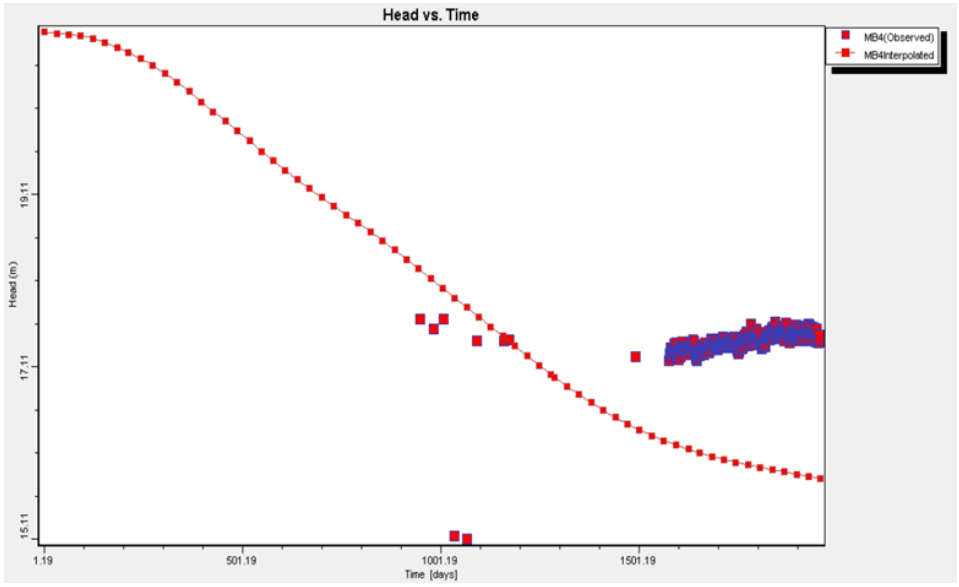


MB03 – Modelled vs. Actual (Observed) ^

Observed levels are higher than predicted (over-prediction of drawdown)

^ *Solid line = modelled*
Points = measured

Figure 2 Drawdown (actual vs. predicted) in monitoring wells north of borefield

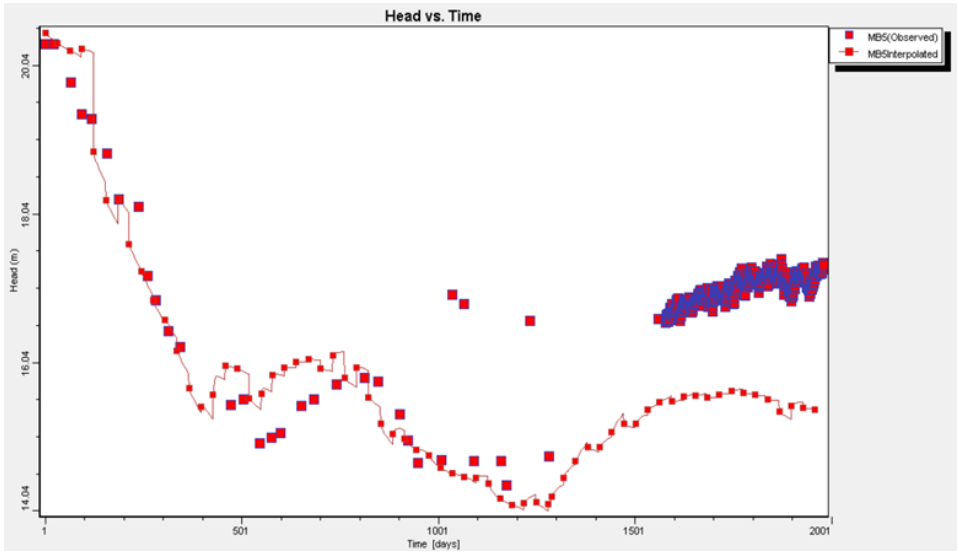


MB04 –

Modelled vs. Actual (Observed) ^

Observed levels are higher than predicted (over-prediction of drawdown)

^ *Solid line = modelled*
Points = measured

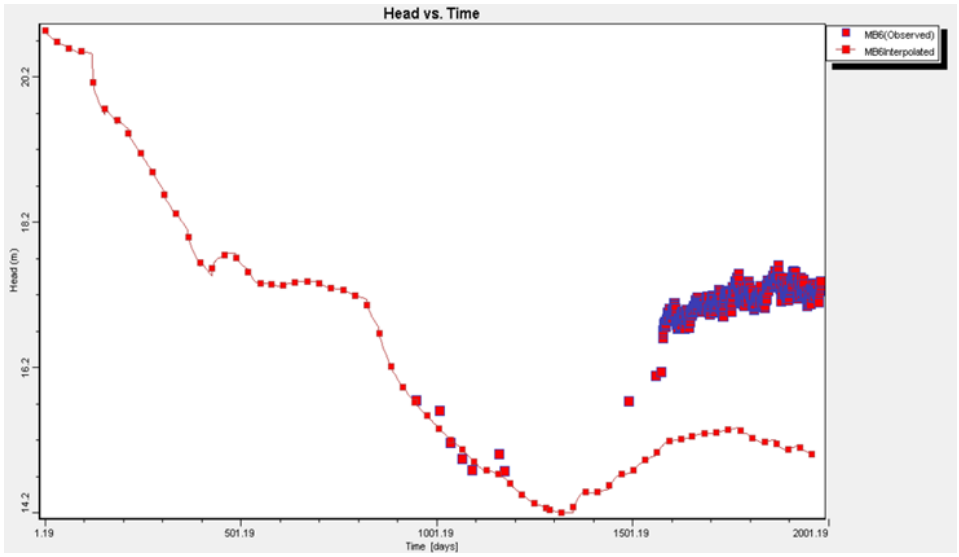


MB05 –

Modelled vs. Actual (Observed) ^

Observed levels are lower than predicted (under-prediction of drawdown)

^ *Solid line = modelled*
Points = measured



MB06 –

Modelled vs. Actual (Observed) ^

Observed levels are lower than predicted (over-prediction of drawdown)

^ *Solid line = modelled*
Points = measured

Figure 3 Drawdown (actual vs. predicted) in monitoring wells south of borefield

Groundwater levels

TSF Interception Scheme

During 2014 the groundwater levels beneath the TSF continued to stabilise and decline, with groundwater levels on the southern side of the TSF below the JA medium risk groundwater level SSTL of 27.5m BGL. To the north/west of the TSF groundwater levels still exceed the high risk groundwater level SSTL of 20 m BGL, with groundwater levels ranging between 18 and 21 m BGL. However a declining trend in groundwater levels is being observed at this location. Based on the groundwater levels on the southern portion of the TSF declining below the medium risk SSTL and that the TSF is no longer active (i.e. no recharge source), the focus on dewatering has been shifted from groundwater mound dewatering to optimised recoveries for process use. The dewatering bores on the northern side of the TSF areas area still being operated for groundwater mounding management purposes. Regardless of the purpose of the dewatering bores, all bores are continuously operated. It is noted that selected dewatering bores were decommissioned in 2014 due to saprolite clay ingress into the screen and gravel pack, reducing the flow rates into the well and clogging the internals of the pumps. The decommissioned bores are now used as monitoring bores.

At time of reporting the system provides a yield of approximately 25 L/sec (approximately 2,100 KL/day) with reclaimed groundwater discharged to the Jacinth process water dam. Interception yield totals approximately 2.1 gigalitres to-date. As expected, recovery performance has declined gradually since commencement of dewatering in December 2012 (Figure 4) due to active interception and the cessation of tailings in May 2013.

A detailed discussion and trends for the TSF groundwater levels is provided below.

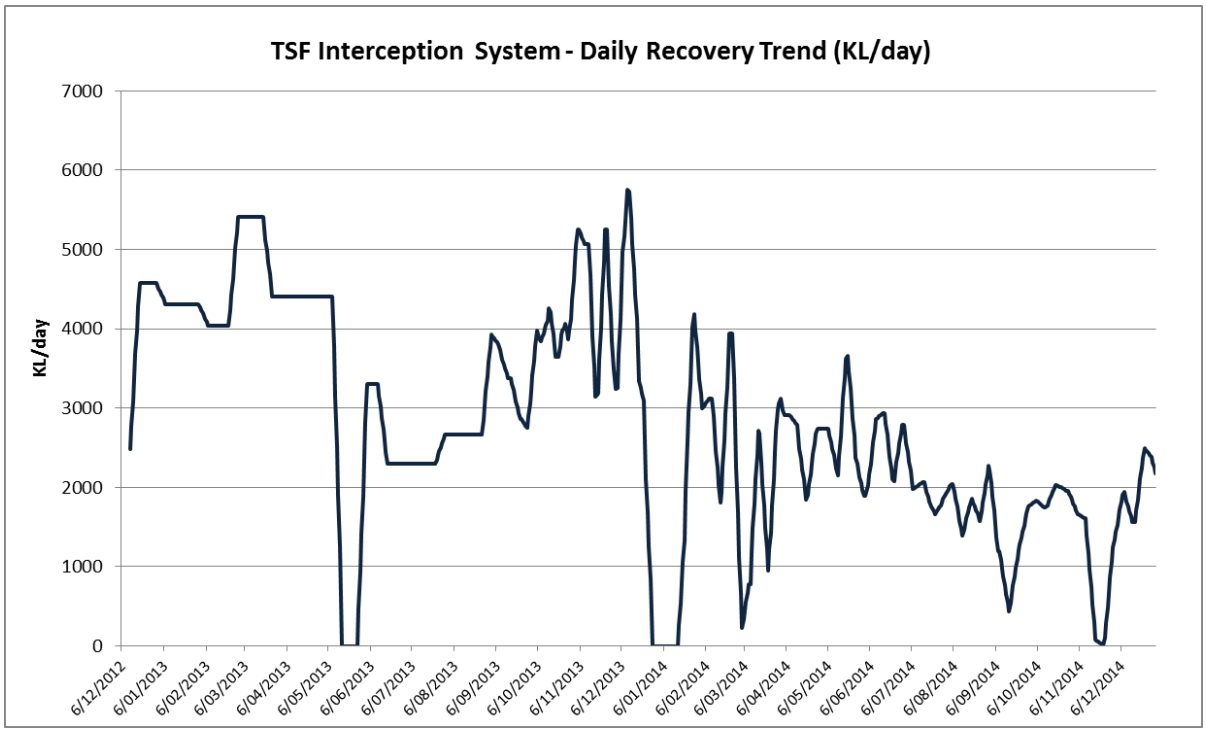


Figure 4 TSF interception recovery (Dec 2012 - Feb 2014)

Off-Path TSF

Monitoring Wells

Monitoring wells and piezometers adjacent to the off-path TSF show either a decline or increase in response to groundwater mound drawdown and/or down-hydraulic gradient migration of the residual mound away from the TSF toward Lake Ifould, respectively.

Key points:

- All monitoring wells on the southern side of TSF below medium risk SSTL of 27.5 m BGL and are still declining (Figure 5).
- All monitoring wells adjacent to the northern side of the TSF are declining; however water levels are still exceeding either the high risk or medium risk SSTL of 20 and 27.5 m BGL respectively (Figure 6).
- Water levels of monitoring wells within the immediate footprint of the northern portion of the TSF range from 18 and 21 m BGL.
- Rising groundwater levels observed in down hydraulic gradient bores MBN11 and MBN08 (west to north-west of TSF) due to movement of the groundwater mound down the local hydraulic gradient toward Lake Ifould.

Further detail on the evolution of the groundwater mounds at Jacinth is provided in section *Groundwater Trends and Management.*

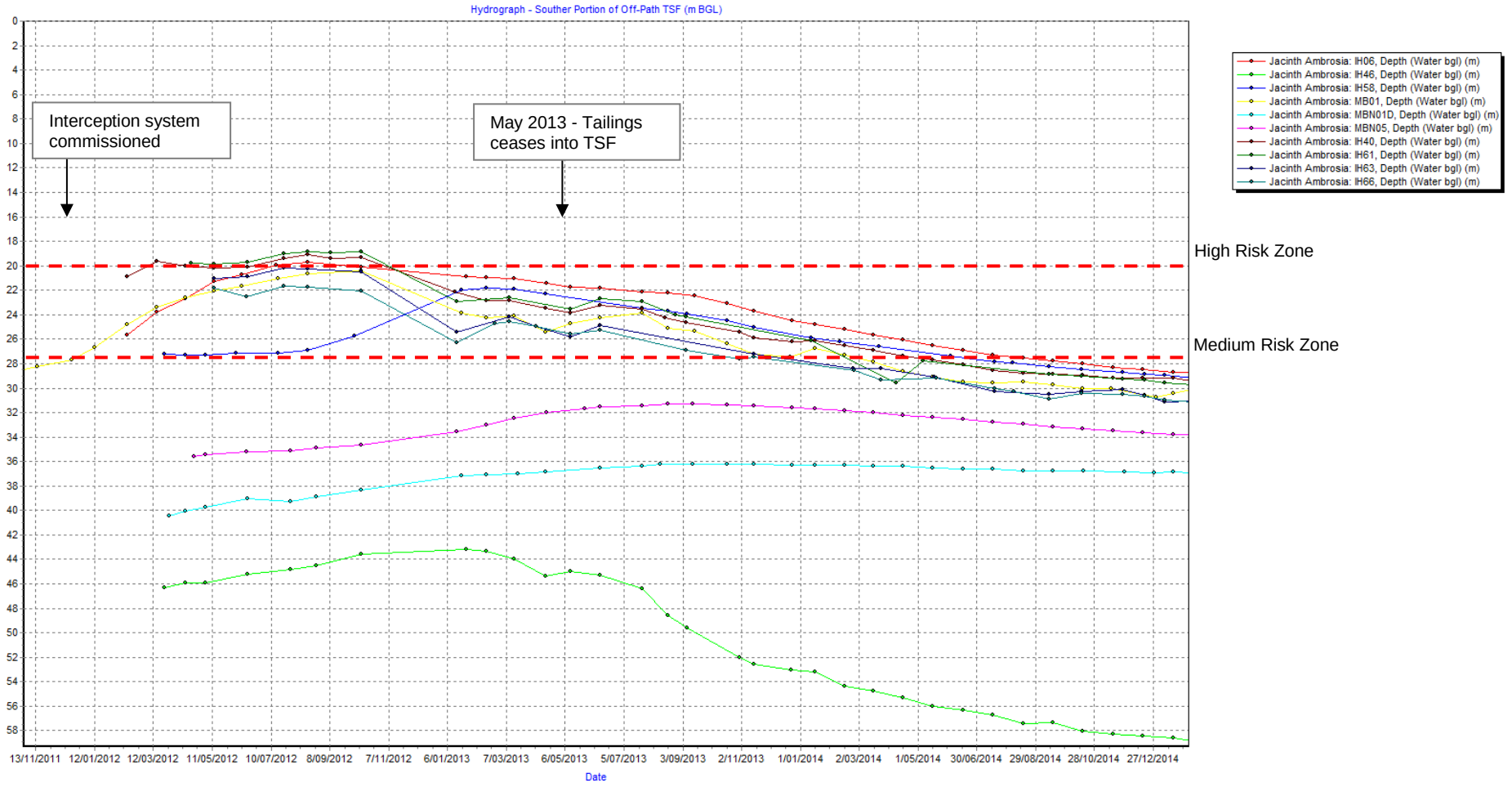


Figure 5 Long term trend in Southern TSF monitoring wells (1/11/11 - 1/2/15)

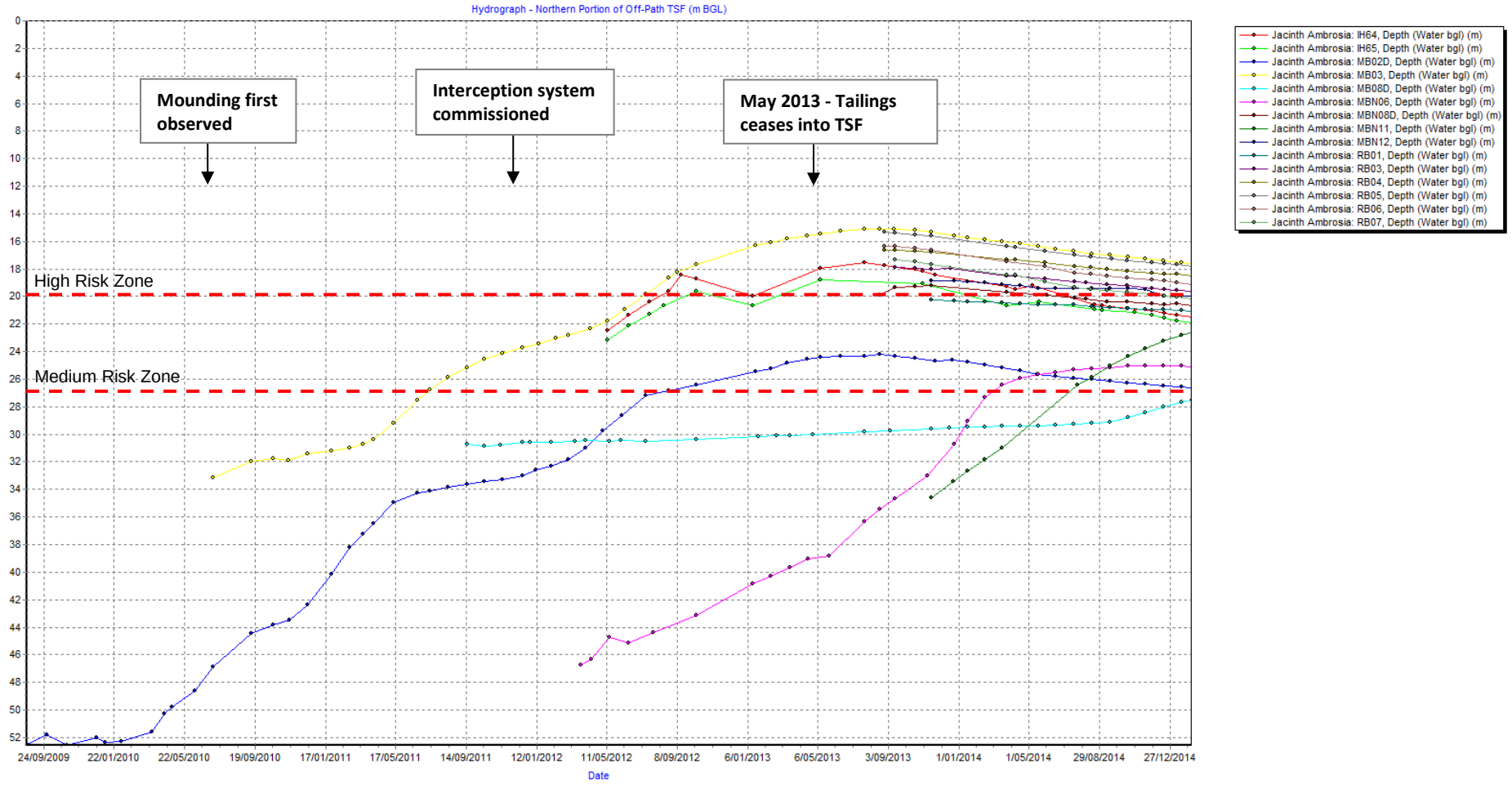


Figure 6 Long term trend in Northern TSF monitoring wells (1/9/09 - 1/2/15)

Cell 1

Water levels in Cell 1 wells continued to decline until September 2013, at which time recurring groundwater rise was observed. This rise was a lag-response to seepage from Cell 2 following the commencement of Cell 2 in-pit tailings in June 2013. However since December 2014 water levels in Cell 1 have generally stabilised (Figure 7).

Water balance data for Jacinth demonstrates water recovery efficiencies of approximately 70% (decant pond and sub-floor drainage recoveries) from Cell 2, with the remainder (approximately 30%) lost to infiltration and evaporation (Figure 7). Cell 1 hosts a hard granite basement and basement high running east-west along northern boundary of Cell 1 which serves to dam groundwater and impede the rate of natural infiltration. Thus, while groundwater levels under Cell 1 had shown gradual decline since interception ceased in August 2012, the rate has been extremely slow and a residual groundwater mound (above the 20 m 'high-risk' SSTL) has remained. Seepage from Cell 2 has acted as a recharge point for the residual mound and caused the recurring rise in groundwater levels.

However, tailing into Cell 2 ceased in October 2014 with the transition of active tailing to Cell 3A; at time of reporting it appears that this cessation of tailing into Cell 2 has reduced the seepage loss to and subsequently stabilised groundwater levels beneath Cell 1. Please note that further monitoring of Cell 1 is being undertaken to confirm this trend which will be discussed in the 2015 compliance report.

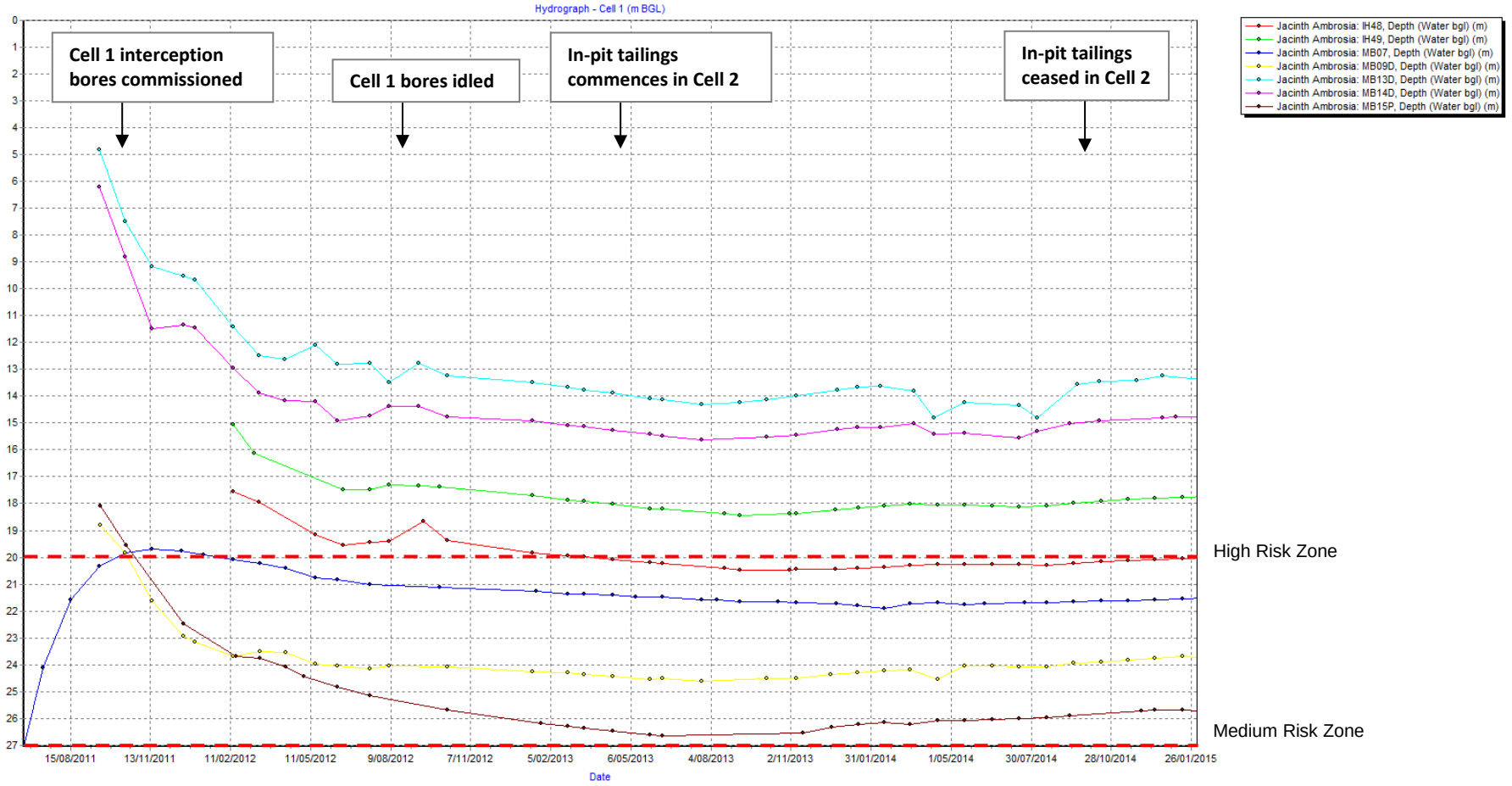


Figure 7 Long-term groundwater trend for Cell 1 bores 1/6/11 - 2/2/15

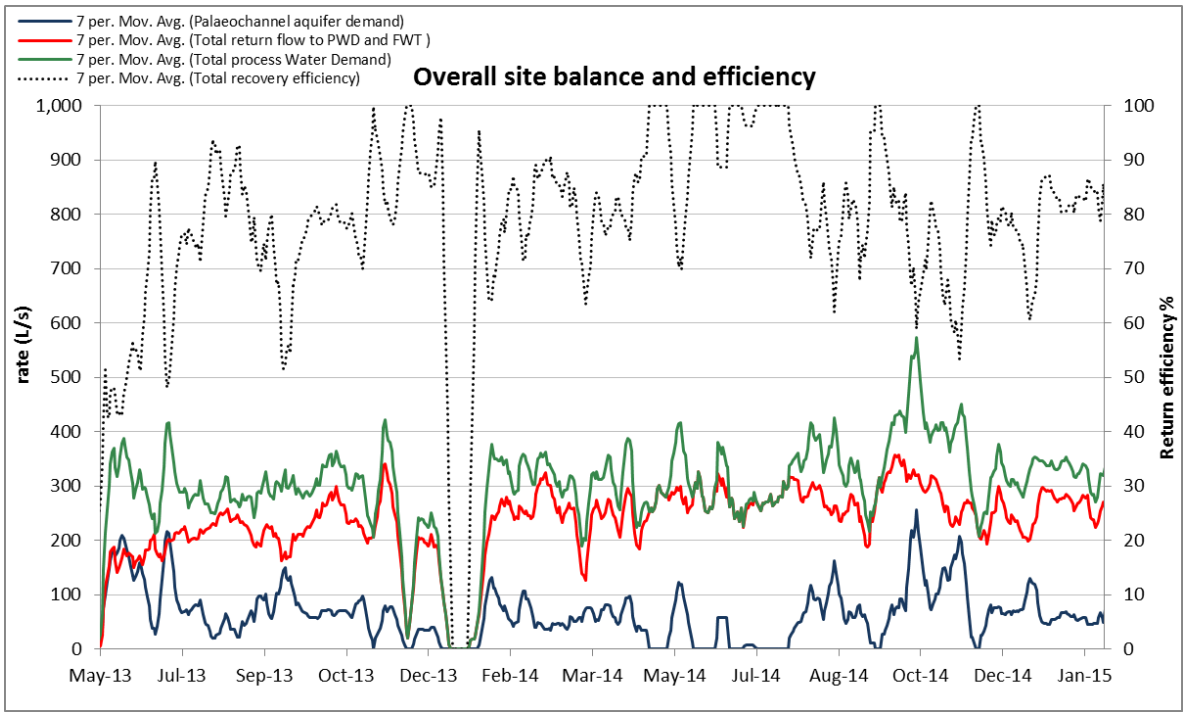


Figure 8 J-A site water balance

Background wells

Consistent with previous reporting J-A background monitoring wells (Canberra, MBN02, MBN03 and MBN07) continue to remain relatively static (Figure 9).

Monitoring well MBN09 located adjacent to the process water dam, located down hydraulic gradient of the mine pit and within close proximity to the off-path TSF has shown in continual increase in groundwater levels since installation in mid-2013. This rise in groundwater level is most likely associated with the down hydraulic gradient movement of groundwater mounds originating from the off-path TSF and operating pit. Increasing groundwater levels have been noted in monitoring bores MBN11 and MB08D installed down hydraulic gradient of the off-path TSF. The rise in groundwater levels at these two monitoring wells is likely due to the down hydraulic gradient movement of the groundwater mound beneath the off-path TSF.

Increasing groundwater levels in monitoring well MB06D have also been noted, with this bore located in close proximity to western portion of Cell 1. However it appears that groundwater levels at this location have stabilised since June 2014.

Groundwater level rises in monitoring wells MBN09, MBN11 and MB08D are being closely monitored – at time of reporting geophysical studies are being undertaken in these areas to understand the migration path of groundwater and anticipated attenuation of groundwater mounding.

Groundwater trends and management

A comparison of groundwater contours in m BGL below final rehabilitation surface (January 2014 compared with January 2015) is shown in Figure 9. These contours appear to confirm the trends observed in the well hydrographs as discussed above, specifically the general

stabilisation of the Cell 1 mound and down hydraulic movement of the off-path TSF mound toward the north-west. In addition the increased water levels to the south of Cell 2 due to tailing into Cell 3A have been observed. The following measures are being undertaken in order to understand and assess the likely migration and attenuation of the off-path TSF mound:

- Review of geophysical data in area of interest to develop an understanding of likely flow path, which may include further geophysical surveys.
- Monitoring of groundwater level to determine rate of movement and attenuation.
- Continued active interception from bores on the northern portion of the TSF.
- Options assessment on further mitigation measures.

The rate of groundwater rise in current tailings cells, such as Cell 3A, continue to be mitigated through the use of sub-floor drainage systems, active pumping of tailing cell decants at two locations and increased efficiency of water recovery from sand tailings. The effectiveness of these water recovery measures is continually being assessed and improved.

Groundwater quality

Iluka conducted quarterly groundwater quality monitoring in 2014 in accordance with MARP commitments. The focus of the 2014 monitoring program was the continued collation of a robust baseline dataset necessary to allow meaningful analysis of groundwater chemistry trends, which has now been completed. A detailed groundwater assessment report containing an assessment of groundwater chemistry will be undertaken in early 2015.

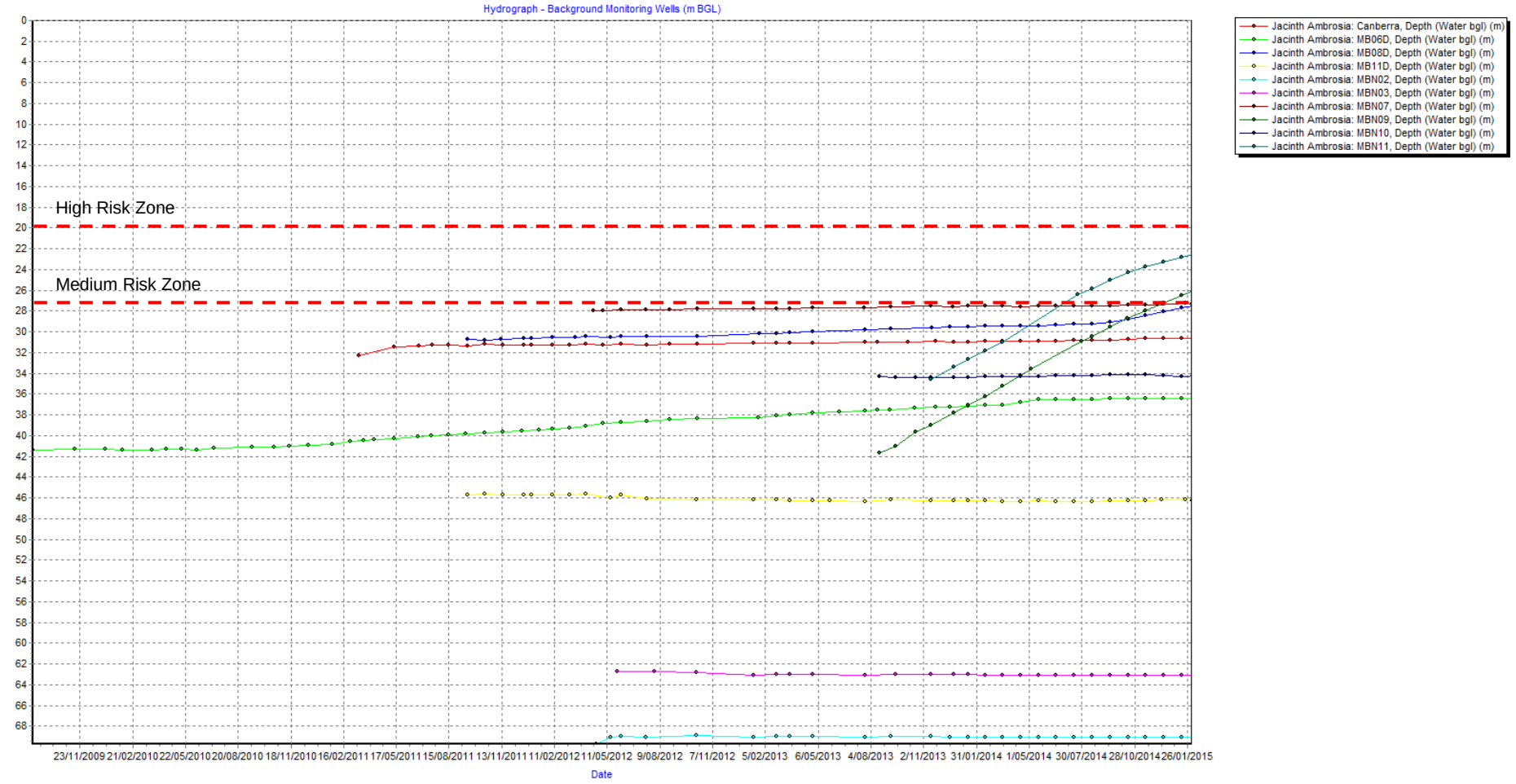
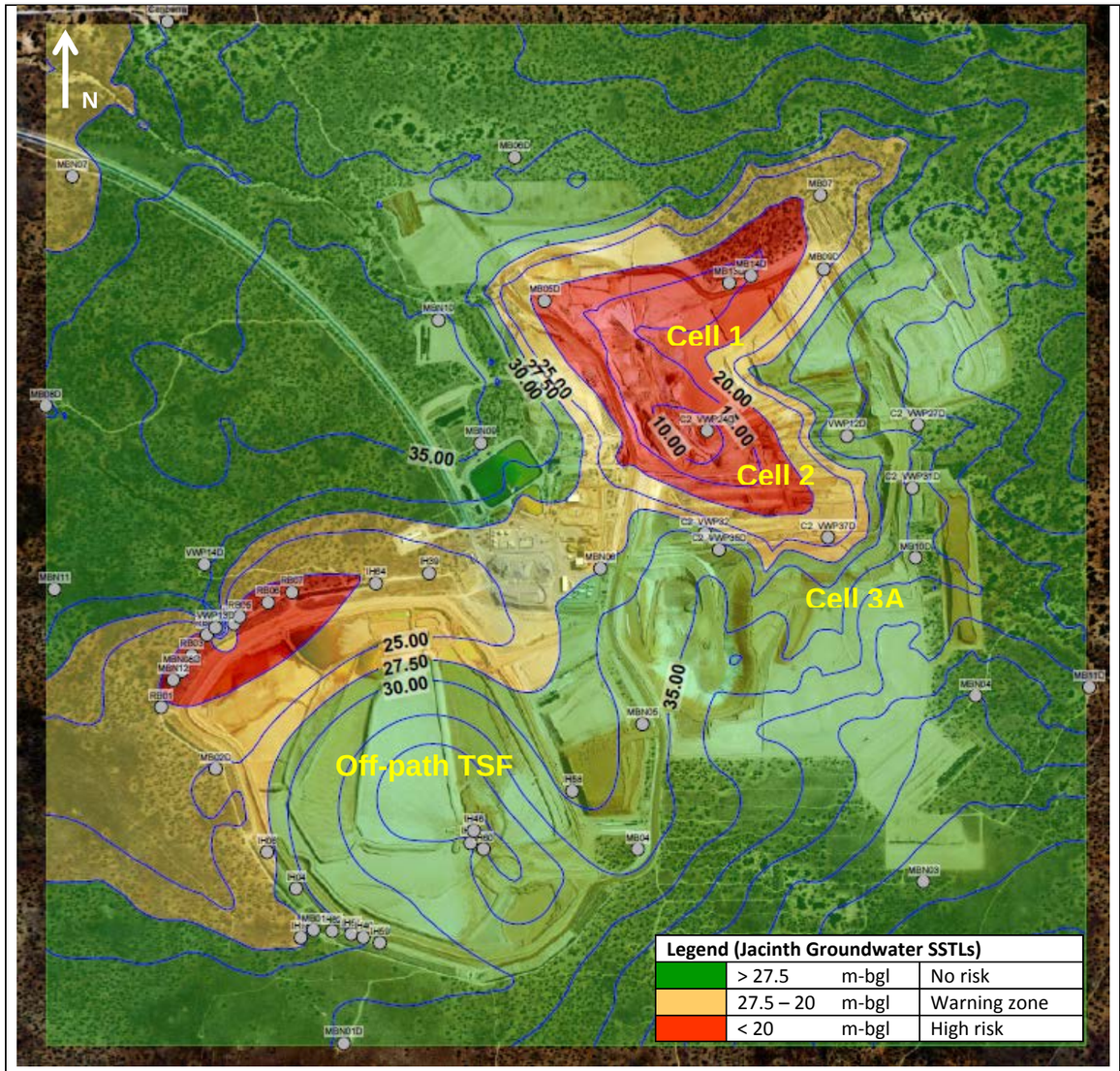


Figure 9 Trend in outlying mine site monitoring wells (1/6/2009 - 1/2/2015)



Groundwater contour, January 2014

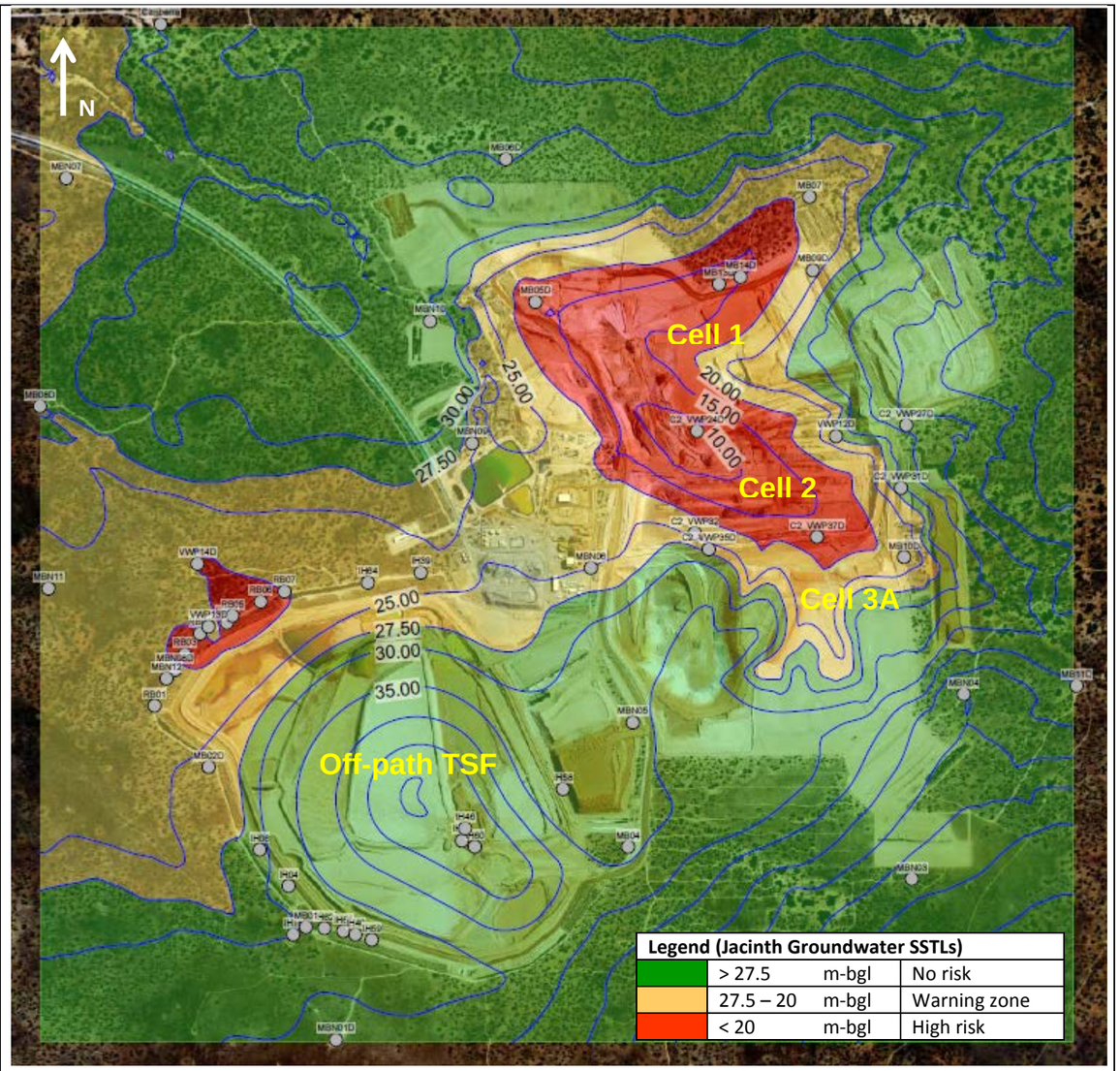
Key Comments:

Cell 1/2

- Cell 1 mound driven by tailings seepage from Cell 2 (post June 2013)

Off-Path TSF

- Groundwater levels on southern portion of TSF are below the “no risk” levels.
- Groundwater levels on the north western portion of the TSF still exceed the “high risk” SSTL.



Groundwater contour, January 2015

Key Comments:

Cell 1/2

- Minor migration of Cell 1 mound to the west
- Cell 2 mound has increased slightly to the south east, due to continual tailing until October 2014.
- Tailing now occurring in Cell 3A located south of Cell 2 has raised groundwater levels to the south/ south east of Cell 2.

Off-Path TSF

- Migration of mound to the north west is evident
- Decrease in water levels exceeding the “high risk” SSTL due to active pumping and attenuation of mound.

Figure 10 Twelve month groundwater contour trend, Jan 2014 vs. Jan 2015

6.8 Dust and Air Quality

Table 22 Summary of outcome criteria for dust and air quality

ML & MPL MARP Outcomes	Criteria	Monitoring Details	Compliance
All clearance of native vegetation is authorised under appropriate legislation.	Demonstrate that actual clearance boundaries are within authorised clearance boundaries (output from GIS).	Annual Biological Survey – Monitor changes in abundance, composition or condition against control sites or background data to identify changes outside approved clearance boundaries. Monitoring to include: Plant mortality Plant health as measured by vigour of new growth, flowering and fruiting Extent of smothering (monitoring by visual observation)	Compliant
All fuel burning equipment is operated in accordance with the requirements of the EPA.	Evidence demonstrates emissions from generators to comply with EPA requirements (design reports, audits, inspections and sampling results).	Visual observations - plant and equipment will not emit to atmosphere visible smoke for any period greater than: 15 consecutive seconds (for plant not registered for use on public roads) 10 consecutive seconds (for plant registered for use on public roads) Annual reporting (energy use): Electricity, LPG, diesel and petrol Greenhouse gas emissions	Compliant

6.8.1 Measurement of compliance

Clearance within authorised boundaries – dust impacts on vegetation

Iluka reconcile survey clearance data with an aerial photograph and calculate the difference between clearances permitted through the Vegetation Clearance Procedure and actual clearance as a measure of compliance to procedures. Field monitoring (vegetation health transects, photo-points, dust deposition gauges and plume mapping) is undertaken to determine/validate dust impacts on vegetation and dust fallout extent in line with the MARP monitoring parameters.

Emissions from plant and equipment

Reporting on emissions from plant and equipment is undertaken using the LCC reporting system (e.g. smoke/exhaust discharge) and statutory reporting including Energy Efficiency Opportunity (EEO) and NGERS (National Greenhouse and Energy Reporting Scheme).

6.8.2 Summary of key measurements

Clearance within authorised boundaries – dust impacts on vegetation

In line with the MARP assessment criteria, dust impact on vegetation is measured as follows:

- Flora Survey: monitoring and reporting on vegetation health and condition as part of annual flora surveys (EBS Ecology).
- Pearl Bluebush (*Maireana sedifolia*) vegetation health transects and photo points: established in 2011 and monitored annually and based on qualitative assessment of dust cover (%), plant mortality and plant health.
- Gravimetric dust gauges to measure ambient dust deposition. The guage network includes impact gauges (near operating areas), background gauges (control sites) and transect gauges to allow cross-reference of dust deposition with vegetation health data.
- HMC dust traps: monitored monthly, traps measure HMC drift from stockpiles. Data will validate the extent of HMC drift and provide an empirical measure of deposition rate and success of stockpile control strategies.

Based on Pearl Bluebush monitoring, Iluka confirms that no vegetation clearance was caused as a result of dust coating outside of authorised clearance boundaries. The full report will be provided in the JARMS 2014/2015, however key points comprise:

- All pearl bluebush monitored in 2013 were alive in 2014.
- Mean dust deposition recorded in dust deposition gauges from 2014 ranged from 8.5 g/m²/month in August to 0.7 g/m²/month in July. Dust deposition has decreased from 2013 rates, where mean dust deposition ranged from 10.3 g/m²/month in September to 0.8 g/m²/month in May.
- Highest dust deposition rates were recorded in the central mining area.

Emissions from plant and equipment

There were no incidents involving uncontrolled or non-compliant emissions (smoke, exhaust or other) from plant and equipment during the reporting period.

Iluka submitted statutory reports in accordance with NPI (National Pollutant Inventory) and NGERS (National Greenhouse & Energy Reporting Scheme) legislation during the reporting period. Copies of these reports can be provided on request.

Emissions from dust

There were seven (7) incidents related to pit dust (5 incidents) and HMC emissions (2 incidents) during the reporting period. Dust related incident reporting in 2014 was significantly lower than

in 2013 (36 incidents), attributed to key dust management programs implemented in the reporting period including:

- Installation of water cart access tracks across the off-path tailings storage facility (TSF) allowing targeted suppression of mobile sands. This was not possible in 2013 due to residual moisture content in the deposited TSF ModCoD tailings which prevented wheeled-vehicle access;
- Optimisation of the J-A reverse osmosis (RO) pre-treatment plant to increase the rate of raw water pre-treatment and thus feed water rate to the RO potable water production plant. This improved the production capacity of potable water for dust suppression. Options for expanded potable product water storage for dust suppression are being investigated at time of reporting;
- The fabrication of a decant system for the rapid-batching of commercial sealants for field and HMC dust suppression; and
- Standardisation of wind forecasting and dust suppression planning as part of the mine daily production planning process and per site Dust and Mineral Stockpiles Management Plans.

HMC Geo-Membrane Trial

A trial installation of a bituminous geo-membrane (BGM) cover for long-term HMC stockpile containment was completed in July 2014 (Plate 13 and Plate 14). Bitumen geo-membrane, designed as a heavy-duty liner for dams and similar applications, was selected on the basis of its weight and durability in extreme heat and wind conditions prevalent at Jacinth. As indicated by the manufacturer, the BGM material had not previously been used for this type of application but offered a unique alternative to HDPE and other materials which had been dismissed as unsuitable for site conditions.

While trial outcomes supported the proof-of-concept of BGM for stockpile containment the continued long-term use of this product was dismissed due to the difficulty of installation and recovery, membrane failures due to wind uplift, and unfavourable cost-benefit compared to traditional water cart and sealant application.

Plate 13 BGM installation

Plate 14 Completed BGM trial

6.9 Solid Waste

Table 23 Summary of outcome criteria for solid waste

ML & MPL Outcomes	Criteria	Monitoring Details	Compliance
No demolition, industrial or solid domestic wastes (other than treated sewerage) are to be disposed on site	Site register contains records of all waste movements from site. Audit and inspection records demonstrate waste correctly stored and managed on site (in accordance with *Waste Management Plan*)	Monthly – visual monitoring and inspection: Appropriate waste disposal and segregation Inspection of sewage infiltration area Annually – summary of total waste disposed: • Sewage • Chemical waste • Hydrocarbon contaminated waste • Tyres • Paper/cardboard • Scrap metal • Waste oil and grease • Batteries	Compliant

6.9.1 Measurement of compliance

Waste register

Iluka maintains a register of wastes removed from site (volume, tonnes and/or litres).

Audit and inspection records

Iluka maintains records of daily and fortnightly inspections completed on waste storage, treatment and disposal areas. Waste related issues and incidents are logged using the Iluka LCC reporting system.

6.9.2 Summary of key measurements

Waste register

Iluka waste contractor Ceduna Can and Bottle provided monthly waste data reports for all waste streams, and EPA Waste Transport Certificates for applicable controlled wastes (e.g. batteries, tyres, hydrocarbon-impacted soils). An example of a monthly Waste Movement Report is provided in Appendix C. In addition, several other contractors were responsible for removal of controlled wastes from site (e.g. septic biosolids, grease trap waste, waste oil). These contractors also provided EPA Waste Transport Certificates or Waste Tracking Forms for applicable controlled wastes.

A detailed summary of waste movements has not been provided in this report but can be made available upon request.

The total waste generated at Jacinth for the 2014 reporting period was 354 tonnes, up from 287 tonnes in 2013 (Table 24). Although total waste generation has increased, the proportion of waste recycled during 2014 accounted for 57% and the quantity (in tonnes) which was recycled has also increased when compared to previous years (Figure 11).

Table 24: Waste removed from site by category and year

WASTE STREAM		2009	2010	2011	2012	2013	2014	TOTAL
DISPOSED								
Contaminated Soil	*Tonnes*	0	0	0	16.5	0	0	**16.5**
General Waste	*Tonnes*	422.3	156.5	133.7	143.3	106.9	152.5	**1118.7**
Grease Trap	*Litres*	0	0	0	0	4500	4500	**13500**
Medical Waste	*Tonnes*	0	0	0	0	0.025	0.085	**0.11**
Septic Biosolids	*Litres*	0	0	0	8000	0	85000	**178000**
Timber	*Tonnes*	0	0	0	14.3	0	0	**14.3**
RECYCLED								
Batteries	*Tonnes*	0	0	0	13.125	4.5	4.899	**22.5**
Cooking Oil	*Litres*	3000	0	0	900	900	1600	**6400**
E-Waste	*Tonnes*	0	0	0	0	0	2.1	**2.1**
Fluoro Tubes	*Tonnes*	0	0	0	0.072	0.072	0.072	**0.216**
Mixed Recycling	*Tonnes*	32.6	36.5	36.3	38.5	25.7	30.5	**202.0**
Paper Cardboard	*Tonnes*	0	0	0	0	0	1.04	**1.04**
Plastics Bulk	*Tonnes*	0.2	0.0	0.0	0.2	1.3	1.7	**4**
Scrap Metal	*Tonnes*	70.2	54.6	53.5	58.6	143.7	135.2	**515.8**
Timber	*Tonnes*	13.4	21.4	10.7	3.7	4.5	25.4	**79.0**
Tyres	*Tonnes*	0	0	0	0.112	0	0.048	**0.2**
Waste Oil	*Litres*	0	0	47000	48000	54000	69500	**218500**
TOTAL GENERATED (RECYCLED + DISPOSED)								
TOTAL	*Tonnes*	539	269	234	288	287	354	**1976.4**
TOTAL	*Litres*	3000	-	47000	56900	59400	160600	**416400**

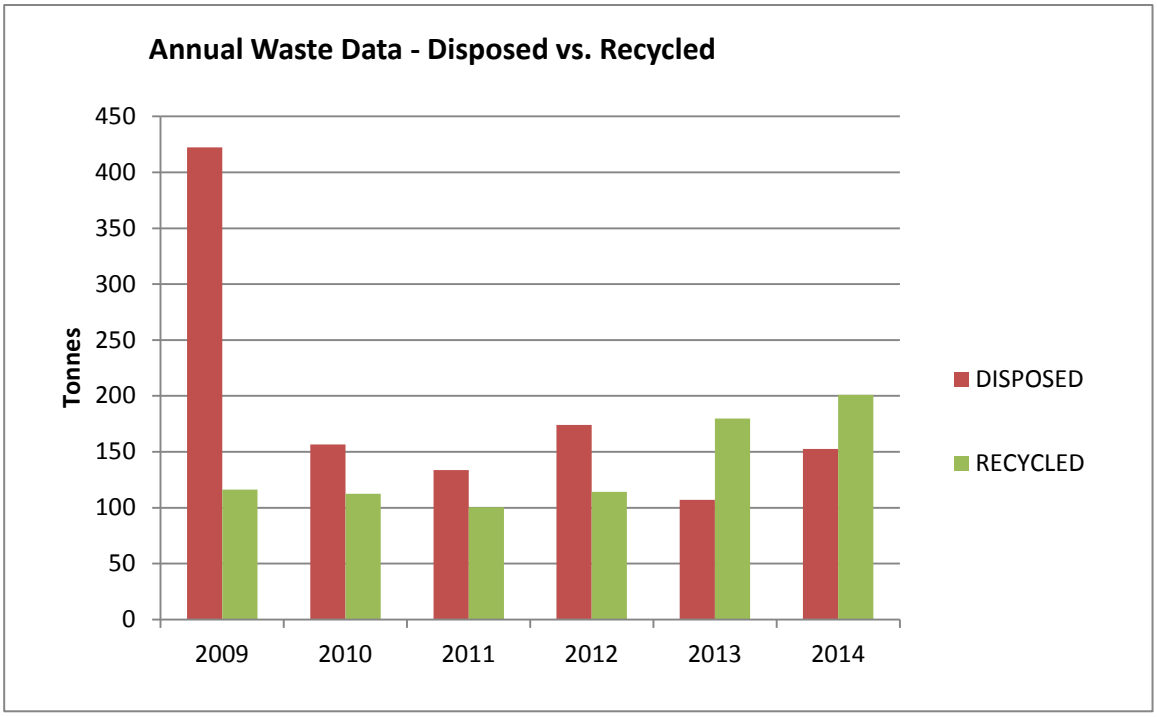


Figure 11: Annual waste data - disposed vs recycled (tonnes)

Audit and inspection records

Inspections of waste storage areas were undertaken weekly by both Iluka personnel and Iluka contractor Ceduna Can and Bottle. Any issues identified by Ceduna Can and Bottle are reported within monthly waste movement records (Appendix C) and are also communicated directly to the Iluka environment team. Iluka environmental personnel document these issues as a LCC and assign corrective actions via Cintellate - the incident reporting database system.

Sewage treatment plants were subject to daily housekeeping, operational maintenance and inspections during the reporting period. These records are documented on the daily inspection log sheet (Appendix C). Any issues or incidents identified are also recorded on this log sheet and are reported (LCC) and rectified as required. In accordance with DEH Approvals, discharges from the village and mine site sewage treatment plants were subject to monthly water quality testing. Records of test results and evidence of compliance can be provided upon request.

Site personnel reported 41 incidents via LCC relating to waste management and disposal in 2014, a 2.5% increase in reporting from 2013. Litter (26 incidents) and incorrect waste storage and segregation (10 incidents) accounted for the majority of issues reported. Formal waste management awareness training implemented in 2014 aimed to address these issues and improve workforce understanding of environmental commitments on waste management.

6.10 Hydrocarbon and Chemical Storage

Table 25 Summary of outcome criteria for hydrocarbon and chemical storage

ML & MPL Outcomes	Assessment Criteria	Monitoring Details	Compliance
Migration or infiltration of any spillage or leakage to the surrounding environment is prevented (in conformance with relevant Environment Protection Authority guidelines).	Demonstrate that facilities are designed in accordance with EPA Guidelines or as otherwise agreed with EPA (via a post construction audit). Records indicate all spills on site are managed in accordance with the *Spill Containment and Clean Up Procedure* (as contained in the Emergency Response Plan).	Visual monitoring: Incidents (spills) including chemical analysis Monthly site / facility inspection – preventative action Quarterly desktop review, hazardous chemical register in place and updated	Compliant

6.10.1 Measurement of compliance

New facilities

Post-construction audit of new facilities to ensure compliance with EPA Guidelines.

Visual monitoring

Routine inspection and maintenance of existing facilities is undertaken to ensure continued compliance.

Spill management and reporting

Timely and correct management and reporting of all storage related incidents and / or spills are in accordance with the Eucla Basin Hazardous Material Management Plan and Iluka Incident Reporting and Investigation Standard (STD1354). Spill and storage management protocols include the following materials; hydrocarbons, chemicals, saline water (other than approved for dust suppression), effluent and other EPA listed hazardous and non-hazardous waste materials, including; fluorescent lights, batteries, contaminated soil, grease trap waste, cooking oil, E-waste. All incidents relating to spills and incorrect management of EPA listed materials are reported via the LCC system.

6.10.2 Summary of key measurements

New facilities

No new facilities were for the storage, handling or management of hazardous materials were constructed in 2014.

Several small-volume flammables and corrosives cabinets were installed across the site during and an existing environmental chemical store re-located to a larger shed to optimise storage

(spill containment, segregation, ventilation and controlled access) as per legislative requirements.

Visual monitoring

Preventative inspection of storage facilities and operational areas was undertaken throughout 2014:

- Daily Borefield and bore-line Inspection – inspection of bore-line infrastructure with emphasis on incidents or hazards concerning saline water.
- Weekly Planned Workplace Inspections – combined OH&S inspection assessing appropriate storage, access to MSDS and emergency response preparedness (e.g. fire control equipment, spill kits). Copies of Planned Workplace Inspection Reports can be made available on request.
- Quarterly Hydrocarbon & Chemical Storage Audits – Monitoring conformance of storage facilities to EPA and AS1940-2004 (Storage and Handling of Flammable & Combustible Liquids) requirements (refer Appendix A).

Spill management and reporting

In 2014 Iluka personnel reported 156 incidents related to spills or inappropriate storage of hazardous materials (Table 26). This is an increase of 122% compared to 2013, when 70 incidents were reported. All spill incidents were managed in compliance with Iluka incident management guidelines – a summary of individual spill incidents and corrective/remedial actions are listed in Appendix A, Table 2 as demonstration of compliance. Open reporting of spill incidents continues to improve in line with the Iluka 'proactivity' sustainability initiative and workforce awareness training.

New chemicals, requested for use on site, were assessed by environmental and OHS specialists in accordance with the J-A Chemical Approval Procedure. Registers of hazardous substances and chemicals were maintained electronically via ChemAlert (refer Appendix A).

Table 26 Summary of hazardous material events reported in 2014

Incident Type	Number of Incidents	% of all spill incidents
Chemical spill	6	4
Effluent spill	5	3
HMC spill	0	---
Hydrocarbon spill	108	70
Inappropriate / incorrect storage	5	3
Saline spill	32	20
Total	**156**	**100**

Hydrocarbon spills

In line with all previous reporting years, hydrocarbon spills accounted for the majority of all spill events (108 incidents), an increase of 151% from 2013. Consistent with historical trends the

overwhelming majority of these incidents (99 incidents, 92% of spills) were linked to hydraulic failures with ranked as Level 1 events (spill volumes less than 15 litres and cleaned within 1 hour).

There were 6 incidents (6% of hydrocarbon spills) ranked Level 2 or higher on the basis of spill volume (between 15 – 240 litres), untimely clean-up or both.

There were 2 incidents (2% of hydrocarbon spills) ranked Level 3 or higher on the basis of spill volume, the extent of impact and clean-up and risk to environment. All of these Level 3 or greater incidents were subject to ICAM (Incident Cause Analysis Method) investigation to determine root cause. These incidents were the significant hydraulic failure from an excavator (400 litres) and operator non-compliance with machine spill shut-down procedures, and failure of an earthen HDPE-lined bund at the site fuel bowser facility. A project to upgrade the fuel bowser facility and bunding system to meet SA EPA guidelines is underway at time of reporting.

There was a single incident ranked as Level 4 which involved the failure and bypassing of oil from the site washbay oil-water separator and contamination of an adjacent swale drain. During incident clean-up additional legacy hydrocarbon contamination was discovered indicating previous unknown failures of this system. An improved preventative maintenance program has been implemented and alternate separation systems are being investigated.

For all incidents contaminated soils were collected for on-site remediation, followed by offsite disposal, once analysed and confirmed as compliant with SA EPA waste fill criteria.

Chemical spills

There were six (6) chemical spills reported in 2014; one of which a Level 2 incident and the remainder being Level 1 incidents. The Level 2 incident was ranked as a Level 2 due to volume spilt and the time taken to clean-up the spill. All other spills were cleaned up within 1 hour per Iluka procedures.

Saline spills

There were 32 saline spills reported in 2014; three of which were ranked as a Level 2 incident and one being ranked as a Level 3 incident. The Level 2 and Level 3 incidents were ranked higher due to the location of where the saline spill had occurred; Level 2 – area previously not impacted by saline water; Level 3 – area previously not impacted by saline water and outside of the mine lease boundary. The Level 3 saline release was reported to DSD on 19th January 2014.

HMC spills

No spills of heavy mineral concentrate, reportable under the Radiation Protection and Control Act, occurred in 2014. HMC spillages or non-compliances, if/where they occur, are reported in detail to the SA EPA Radiation Protection Branch within the Iluka J-A Annual Radiation Compliance and Monitoring Report, pursuant to Iluka EPA Radiation Protection Licence LM10.

Effluent spills

Five effluent spills occurred in 2014; all incidents were minor incidents and resulted from either operational or housekeeping issues and/or equipment failures at the Jacinth village and mine site wastewater treatment plants. All incidents were dealt with immediately and maintenance and additional monitoring improvements implemented. Key events included:

- Jacinth village: humus tank overflowed (approx. 100 L) on to unsealed ground, causing the final transfer tank to lift out of ground. Cause was due to scum build up in primary tank 3 weir box and the humus draw-off pipe / tank, which then caused flow restrictions and back-up of water in the humus tank. The overflow from this tank ran down slope towards the transfer tank (Plate 15).

- Mine Site: effluent pump seized due to unknown blockage, causing 50 L of effluent to spill onto bare ground. High level alarm was activated and the site control room and maintenance team responded immediately to rectify.

In accordance with health approvals for these systems, incident notifications were included in the annual report which was submitted to the Department of Health (DEH). Full LCC reports can be provided on request.

Plate 15 Overflow of wastewater from the humus tank at Jacinth village

6.11 Public Safety

Table 27 Summary of outcome criteria for public safety

ML & MPL MARP Outcomes	Criteria	Monitoring Details	Compliance
There are no public injuries and or deaths resulting from mine operations traffic, dust generation or unauthorised entry to mine site that could have been reasonably prevented.	Incident investigation report concludes that the incident was not a result of mine operations or could not have been reasonably prevented.	Incident investigation (as required) – incident cause and corrective/preventative actions	Compliant
No uncontrolled fires caused by mining operations.	Incident investigation report concludes that the incident was not a result of mine operations or could not have been reasonably prevented	As above	Compliant

6.11.1 Measurement of compliance

Reporting of public safety incidents via the Iluka LCC incident management system – this includes incidents of uncontrolled site access, operations traffic, dust and fires linked to mine operations.

6.11.2 Summary of key measurements

Iluka report no public injuries or deaths, or uncontrolled fires attributed to mining operations for during the reporting period.

Notwithstanding, in 2014 Iluka (via its haulage contractor Kalari Transport) recorded 46 incidents involving unsafe pedestrian activity (safety hazards and near hits) and unsafe driving behaviour encountered on the haulage route between J-A and Port Thevenard.

Vehicle interactions (28 incidents) involved unsafe and erratic driving behaviours by other road users along the Eyre Hwy between Ooldea Road the Ceduna.

Of more significant concern were 18 incidents involving unsafe behaviours by pedestrians. In late 2013 and early 2014 Iluka and Kalari Transport identified an increase in community pedestrian safety issues in Ceduna and along the Eyre Highway. Between December 2013 and July 2014 Kalari Transport recorded 18 ‘near hit’ incidents involving its road trains and pedestrians within Ceduna, Ceduna outskirts and along the Eyre Highway. All incidents were recorded by on-board dash cameras and included:

- Large groups of intoxicated persons fighting in the middle of Eyre Highway
- Persons walking on the edge of the Eyre Highway at night
- Persons crossing the road in front of oncoming road trains, often at night

- Persons asleep on the road
- Member of public suicide attempt involving road train (no injury / fatality occurred).

Detailed summaries of these events are provided in Appendix A Table 3.

Recognising the need for united engagement between community and government on this issue, Kalari and Iluka implemented a program that addressed the immediate pedestrian safety risks. The program also aimed to reinvigorate government support processes and services and positively influence community awareness on road safety. Throughout 2014 Kalari and Iluka initiated extensive consultation with local and state government; community services groups and regional communities to influence and encourage a unified response to this issue.

As a result of the abovementioned processes, Kalari road train pedestrian interactions declined by 45% from October 2014. Efforts and engagement on road train safety are ongoing at time of reporting.

Iluka and Kalari are developing a road train safety advertisement addressing road safety and pedestrian behaviour for rollout across the far west coast region in 2015. This will be developed in consultation with key stakeholders, providing community engagement, ownership and include a tour of regional communities with the Kalari road train simulator.

6.12 Socio Economic

Table 28 Summary of outcome criteria for socio economic

ML & MPL MARP Outcomes	Criteria	Monitoring Details	Compliance
There are no socio-economic impacts associated with the project that could have been reasonably prevented.	Implementation of closure plan / exit strategy that addresses socio-economic issues	Investigation evidence (records, reports etc.) as required. Monitoring of socioeconomic parameters	Compliant

6.12.1 Measurement of compliance

Closure Plan

Iluka resolves to integrate socio-economic issues into the J-A Mine Closure Plan. A study commissioned in 2014 by Iluka (conducted by Ernst & Young) to assess employment and economic contributions of the Eucla Basin operation will inform the integration of socio-economic elements into the closure plan.

Interim measures of compliance comprise employment, business development and community sponsorship managed through commitments within the Iluka and Far West Coast Native Title Mining Agreement (NTMA) and Iluka Eucla Basin Stakeholder Engagement Plan.

In 2009, Iluka conducted a Social and Cultural impact assessment that outlined a range of issues concerning the community. An amendment to the MARP on 11 November 2009 included additional commitments relating to consultation with the Far West Coast Native Title Group. Progress related to these commitments is detailed in Table 30.

6.12.2 Summary of key measurements

Closure Plan

Iluka has not yet developed a Closure Plan examining the socioeconomic impacts and associated programs of closure. At this time emphasis within the 2014/2015 Stakeholder Relations Plan remains on stakeholder relations linked with active mine operations.

The Jacinth mine is currently in the operating phase and hence development of the Socio-Economic Jacinth Closure Plan will be undertaken later in the mine operating life cycle when closure commitments and impacts will be better understood.

Employment

Iluka's current workforce is 69 at Jacinth Ambrosia comprising 21.73% of Far West Coast Traditional Owners (aspirational FWC indigenous employment target of 20%). Total local employment for the region is currently 46.37%, this includes Indigenous, non-indigenous and

gender diversity (Table 30). Included in this percentage are three Far West Coast employees who transferred from Fixed Term employment to Permanent positions in 2014 (Table 29)..

In 2014 Iluka developed and implemented a formalised Indigenous recruitment procedure to manage and coordinate employment, training and mentoring opportunities for the Traditional Owners of the Far West Coast region. Iluka has also offered tailored work site visits for students that have expressed a particular interest in a career within the mines such as Geology and Plant Operators.

Casual labour hire is sourced locally creating ongoing opportunities, providing further work experience, training and personal development for local people, Indigenous & non-indigenous. At time of reporting FWC Mining and Civil, a business venture established through development funds via the FWC Native Title Mining Agreement, are developing a labour hire service. This service will provide tailored service, training, career pathways and support for the Traditional Owners in the region.

Table 29 Jacinth-Ambrosia current workforce statistics

Iluka Employees	Number	% of total workforce
Local	32	46.37
Indigenous	17	24.63
Traditional Owners (FWCG)	15	21.73
Gender Diversity	8	11.59
Total Workforce	69	100

Community engagement

Iluka held or attended several community events in 2014, engaging over 3500 people from 24 communities. In 2014 Iluka were proud community sponsors and participants in the annual Ceduna Oysterfest festival, Marilyn Country Music Muster, National Aboriginal Islander Day Of Celebration (NAIDOC), Ceduna Carols by Candle Light and “Youth Taking Control Program”; Iluka participated in Industry Leadership Group Discussions (focused on the recruitment and retention of regional Indigenous and non-indigenous employees and building their capacity for employment); delivered on-site “Talk to Schools” program, providing mine site work experience at J-A; Iluka held information stalls at local events such as NAIDOC, Oysterfest, Science Alive Expo and Yalata Carnival, offering career advice and information on the on-site environmental and rehabilitation programs at J-A.

Targeted site visits are conducted and prioritised on school groups and future jobseekers based on career development in Geology, Mechanics, Plant Operators, Rehabilitation and Environment. Indigenous members of the Far West Coast community, expressing interest in the employment at J-A are identified and in small groups, offered opportunities to spend the day with Iluka staff, giving them a sense of responsibility, understanding of life on the mine and provided with information in career paths within J-A.

Table 30 Summary of compliance – socio-economic criteria

Outcomes – Socioeconomic	Criteria	Activities	Compliance
There are no socio-economic impacts associated with the project that could have been reasonably prevented.	Implementation of closure plan / exit strategy that addresses socio-economic issues	To be determined – Interim closure impacts are managed via the 2014/15 Eucla Basin Stakeholder Relations Plan.	Compliant
Iluka maintains its focus on providing information support and dialogue with Aboriginal People and agencies in the area through its presence of Human, Community and Indigenous Relations personnel.	Employment of Community Relations Officer	Employment of fulltime Ceduna-based Community Relations Officer who manages all community and indigenous affairs (including native title commitments) associated with Iluka's operations on the SA far west coast. Community Relations Officer supported by line manager, and a Senior External Relations Advisor and Human Resources Manager in Adelaide.	Compliant
Iluka communicates community concerns regarding future traffic hazards, including signage and poor lighting to DTEI and the Ceduna Council.		Extensive consultation with local and state government on pedestrian safety issues. Liaison with Ceduna Council on pedestrian crossing, safety fencing and lighting.	Compliant
Iluka develop cultural guidelines for all mine staff, including employers and sub-contractors employing Aboriginal people, to ensure respectful work practices are followed.		Cultural guidelines have been developed, implemented across Iluka and all contractors. Respect for Traditional Owners, cultural heritage, sites of significance and the country is one of the Iluka's "Golden Rules" and is enforced by all management at J-A (including exploration and corporate staff). Cultural Awareness Training, conducted by local business Iwara Nindini is delivered quarterly to all Iluka staff and contractors who will be employed for a period greater than three months.	Compliant

Outcomes – Socioeconomic	Criteria	Activities	Compliance
Iluka consider developing an information digital story highlighting the relationship, its Agreement process, activities, opportunities and future aspirations for Far West Coast Claimants, School children and government.		SA Works developed Aboriginal employment at J-A mine video Developing NTA presentation (for internal use) and fact sheet (for external distribution) Case studies of successful scholarship awardees.	Compliant
Iluka consider developing an interpretive display – to be centrally located i.e. the Aboriginal Arts and Culture Centre or Town centre. The interpretive display could also be used to link the FWC story with the Cultural Awareness training course.		Cultural Awareness Training, conducted by local business Iwara Nindini is delivered quarterly to all Iluka staff and contractors who will be employed for a period greater than three months. Native Title Agreement: establishment of Cultural Heritage fund provides access to funding for all FWC Claimants for cultural events, activities etc.	Compliant
Iluka continue to update the Liaison Committee on potential employment opportunities for FWC people haulage mining and camp services.		All job advertisements distributed to communities by the Iluka Community Relations Officer; notification in quarterly FWC Liaison Committee meetings; put in the local paper *The Sentinel* and on Iluka website and seek.com. Formal Iluka FWC recruitment, training and mentoring procedures developed and implemented in 2014. Procedures provide a structured approach to the recruitment and retention of FWC employees; procedures apply to both Iluka and contractors.	Compliant
The FWCNTCG to provide ongoing transparent communication and engagement with Aboriginal communities to keep community members abreast of the Agreement and any outcome of discussions with Iluka Resources.		Regular visits to communities, presentations, awareness road-shows. Quarterly Liaison Committee meetings with Iluka and FWC representatives. Complaints form and process for the FWC traditional owners implemented February 2011.	Compliant

Outcomes – Socioeconomic	Criteria	Activities	Compliance
Consideration be given to providing financial advice and/or counselling to those working at the mine who are interested in good financial management for their family.		Not applicable in 2014	Compliant
2014 - Iluka Resources hosted targeted site visits for community people, including school children, organisation and committee groups to learn about the mine and Iluka Resources activities.		• 2014 Site Visits • Oysterfest • NAIDOC week • Science Alive Expo • Ceduna Youth Hub - Golf Day • Yalata Carnival • Work Inspiration – Eyre Futures • Iluka newsletter in local paper	Compliant

7 RECTIFICATION OF NON-COMPLIANCES

7.1 Non-compliance

No non-compliances are reported in this document.

7.2 Action List from Previous MARCRs

Future actions to complete or improve operational outcomes as identified within previous compliance reports are listed in Table 31. While these actions do not demonstrate non-compliance they do require resolution.

Table 31 Action list from previous MARCRs

Item	Due	Status / Comments
Weeds – Iluka to review the achievability of weed management objectives and outcomes specified in the MARP	2014	**Complete** - Revision of compliance outcomes and assessment criteria carried out with MARP/PEPR review.
Surface water – achievability of monitoring surface water quality requires review	2014	**Complete** - Rising stage surface water samplers installed 2014.
Dust & Air Quality – major review and update of the J-A Air Quality Management Plan, based on the programs and initiatives outlined below.	2014	**Complete** - Major review and update of JA Dust and Air Quality Management Plan completed in late 2013/early 2014. Significant improvement in site dust practices reflected in reduced dust incidents – refer Section 6.8.
Mineral Stockpiles - review of HMC management techniques and strategies including windbreaks, wind-based stockpile orientation and design and dust suppression techniques and materials;	2013 - 2014	**Complete** - Mineral Stockpiles Management Plan developed in late 2013/early 2014, complimentary to Dust and Air Quality Management Plan.

8 MANAGEMENT AND SYSTEMS REVIEW

Iluka's EHS Management System (EHSMS) was subject to a major update in 2013 – the EHSMS now consists of fourteen (14) standards as below:

01 – Risk & Hazard Management
02 – Stakeholder Relations
03 – Training & Awareness
04 – Contractor Management
05 – Design, Construction & Operations
06 – Process Safety
07 – Environmental Management
08 – Rehabilitation & Closure
09 – Carbon & Energy
10 – Radiation Management
11 – Workplace Health & Hygiene
12 – Incident Reporting & Investigation
13 – Emergency & Crisis Preparedness
14 – Auditing & Assurance

All Iluka sites completed an internal compliance gap analysis against these new standards in 2014 which will guide more detailed plan and procedural level audits in 2015.

9 FITNESS FOR PURPOSE REVIEW OF PLANT, EQUIPMENT, INFRASTRUCTURE AND OTHER FACILITIES

Guidelines require reviews at least once every five years. Copies of practical completion sign-off records for various infrastructure and equipment have been provided in previous MARCR documents.

10 NEW ENVIRONMENTAL HAZARDS

No new environmental hazards were observed in 2014.

11 ENVIRONMENTAL PROTECTION AND BIODIVSERISTY CONSERVATION REPORTING

An EPBC referral was prepared and submitted to the Department of Environment and Natural Resources (DENR) for all aspects of the J-A project. DENR subsequently advised that the project was "Not a Controlled Action" under the EPBC Act.

12 REFERENCES

EBS (2015) Jacinth-Ambrosia Fauna Monitoring November 2014. Report to Iluka Resources. EBS Ecology, Adelaide.

EBS (2015) Jacinth-Ambrosia Mine, Vegetation Monitoring Observations, November 2014. Report to Iluka Resources. EBS Ecology, Adelaide.

Appendices

APPENDIX A TABLES

Table 1 Species collected for J-A seed collection program

Family	Genus	Species	2009	2010	2011	2012	2013	2014
Aizoacea	*Tetragonia*	*eremaea*	✓	-	-	-	-	-
Amaranthaceae	*Ptilotus*	*obovatus*	✓	-	✓	✓	✓	✓
	Ptilotus	*exaltus*	-	-	✓	-	-	-
Asclepiadaceae	*Marsdenia*	*australis*	-	-	✓	-	-	-
Casuarinaceae	*Casuarina*	*pauper*	-	-	-	✓	-	
Chenopodiaceae	*Atriplex*	*vesicaria*	✓	✓	✓	✓	-	✓
	Chenopodium	*curvispicatum*	-	-	✓	✓	-	✓
	Enchyleana	*tomentosa*	-	✓	-	✓	✓	✓
	Eriochiton	*sclerolaenoides*	✓	✓	✓	✓	✓	✓
	Maireana	*erioclada*	✓	✓	✓	✓	-	-
	Maireana	*integra*	✓	✓	✓	-	-	-
	Maireana	*pentatropis*	✓	✓	-	✓	-	-
	Maireana	*radiata*	-	✓	✓	✓	-	-
	Maireana	*sedifolia*	-	-	-	✓	-	-
	Maireana	*trichoptera*	✓	✓	✓	-	-	-
	Maireana	*turbinata*	✓	✓	✓	✓	-	-
	Rhagodia	*parabolica*	✓	-	-	✓	✓	✓
	Rhagodia	*spinescens*	✓	-	-	✓	-	-
	Salsola	*tragus*	✓	-	-	✓	-	-
	Sarcocornia	*species*	✓	-	✓	✓	-	-
	Scleroleana	*obliquicuspis*	-	✓	-	-	-	-
	Scleroleana	*patenticuspis*	✓	✓	✓	✓	-	-
Compositae	*Brachyscome*	*ciliaris var. ciliaris*	✓	-	-	-	✓	-
	Calotis	*hispidula*	-	-	-	-	✓	-
	Cephalipterum	*drummondii*	✓	✓	-	-	✓	✓
	Cratystylis	*conocephala*	✓	-	-	✓	-	-
	Pycnosorus	*pleiocephala*	✓	-	-	-	✓	-
	Rhodanthe	*floribunda*	✓	-	-	-	✓	✓
	Vittadinnia	*cervicularis*	✓	✓	-	✓	✓	✓
Cruciferae	*Lepidium*	*phlebopetalum*	✓	-	-	-	✓	-
	Arabidella	*glaucescens*	-	✓	-	-	-	-
	Stenopetalum	*lineare*	-	-	-	-	✓	-
Frankeniaceae	*Frankenia*	*species*	✓	✓	✓	-	-	-
Goodeniaceae	*Goodenia*	*pinnatifida*	✓	-	-	-	-	-
Gramineae	*Austrodanthonia*	*caespitosa*	✓	✓	✓	✓	-	-
	Austrostipa	*platychaeta*	✓	✓	✓	-	-	-
	Austrostipa	*eremophila*	✓	✓	✓	-	✓	-
	Austrostipa	*nitida*	✓	✓	✓	-	-	✓
	Eragrostis	*falcata*	✓	-	-	-	-	-
Leguminoseae	*Acacia*	*ligulata*	-	-	✓	-	-	✓
	Acacia	*oswaldii*	-	-	✓	-	-	-
	Acacia	*papyrocarpa*	✓	✓	✓	✓	-	-
	Glycine	*sp*	-	-	-	✓	-	-
	Senna	*artemisioides ssp. coriacea*	✓	-	✓	-	-	✓

Family	Genus	Species	2009	2010	2011	2012	2013	2014
	Senna	*artemisioides ssp. petiolaris*	-	-	✓	✓	-	✓
	Senna	*cardiosperma ssp. gawlerensis*	✓	-	-	-	-	-
Malvaceae	*Radyera*	*farragei*	✓	-	-	-	-	-
Myoporaceae	*Eremophila*	*latrobei ssp. glabra*	✓	-	-	-	-	-
	Eremophila	*alternifolia*	-	-	✓	-	-	-
	Myoporum	*platycarpum*	-	-	✓	-	-	-
Myrtaceae	*Eucalyptus*	*oleosa ssp ampliata*	✓	-	-	-	-	-
	Eucalyptus	*gracilis*	-	-	-	✓	-	-
	Melaleuca	*interioris*	-	-	-	✓	-	-
Santalaceae	*Santalum*	*acuminatum*	✓	-	-	-	-	-
	Santalum	*spicatum*	✓	-	-	-	-	✓
Sapindaceae	*Alectryon*	*oleifolius*	-	-	-	✓	-	-
	Dodonaea	*viscosa ssp. angustissima*	✓	-	✓	-	-	✓
	Duboisia	*hopwoodii*	-	-	-	✓	-	-
Zygophyllaceae	*Zygophyllum*	*apiculatum*	-	-	✓	-	-	-
	Zygophyllum	*aurantiacum ssp aurantiacum*	✓	✓	✓	✓	✓	-
	Zygophyllum	*eremaeum*	✓	✓	✓	-	-	-
	Zygophyllum	*ovatum*	✓	✓	✓	-	✓	-

Table 2 Hydrocarbon and other spill incidents reported via LCC, 2014

Incident #	Date	Level	Details	Actions
Hydrocarbon Spills				
INC176683	15/01/2014	1	Hose blown on Kalari truck trailer, causing oil spillage at GRA Port Thevenard Bunker. Spill confined to hardstand area.	Disengaged Power Take Off (PTO) to stop flow of oil. Contained spill and cleaned up. Repairs undertaken on trailer.
INC177342	21/01/2014	1	Hydraulic hose failure on Kalari TRT at JA causing spillage of approx. 10L of hydraulic oil onto HMC hardstand.	Shut down PTO, disconnected hydraulic hose. Spill cleaned up and oil contaminated HMC placed back through mining unit.
INC178227	31/01/2014	1	The number 1 fill nozzle at the fuel bowser did not shut off automatically causing excess diesel to spill (approx. 5L).	Reported to supervisor. SAP notification to for repair of fuel nozzle.
INC178280	01/02/2014	1	Various damp hydraulic connections under MUP which require tightening. Risk of larger leaks with high pressures in line during MUP moves	Reported to supervisor. SAP notification completed and inclusion of checks and maintenance of connections during weekly track operation checks.
INC178520	03/02/2014	3	Hydraulic hose failure on Hitachi 1900 excavator resulting in 400L hydrocarbon being spilt onto bare ground.	Plant shutdown procedures updated and communicated to operators. Environmental incident education program rolled out to site. Site induction updated to reference plant shutdown protocols and contractor personnel workforce required to re-sit site induction.
INC179054	08/02/2014	1	Fuel overflowing from fuel tank on fire truck due to slope; approx. 0.5 - 1 L spilt onto asphalt parking area.	Cleaned up using absorbent matting. Bucket placed fuel tank where leak was occurring. Reported to ERT Team and supervisor.
INC179492	10/02/2014	1	Trail of oil coming from Iluka workshop door and flowing onto road - oil on concrete and road only (no soil impact).	Cleaned up within hour and reported to supervisor.
INC179914	10/02/2014	1	Over fuelled yakka pump, diesel leaked onto workshop drive way. Clear filler hose has been installed previously to prevent from happening however it has not solved the problem. No impact to soil.	Spill contained on workshop drive way with no impact to soil. Cleaned up spill using spill kit contents. Reported. New laydown area identified for level storage of pump sets.

Incident #	Date	Level	Details	Actions
INC179796	14/02/2014	2	Excessive rain flooded Exact workshop flooding oil sumps causing oil/water run off outside of workshop and into truck wash bay, work shop yard and soakage trench next to process dam.	Soil bunds and spill booms installed immediately to contain run off. Water truck and fire pumps used to dewater the sumps with recovered oily water placed through oil-water separator. All contamination was cleaned up within 24 hours. Loaders and excavators were used to clean up contaminated soil. Bunds and washouts repaired and culverts installed. Surface water management plan reviewed.
INC180935	22/02/2014	2	EX428 blew a hydraulic hose on motor, approx. 100L spilt to ground.	Reported and cleaned up using spill kit. Cleaned up within 1 hour.
INC181349	23/02/2014	4	Oil release from wash bay oil-water separator into soakage trench adjacent to mine Waste Water Treatment Plant and subsequent identification of legacy hydrocarbon soil contamination discovered in soakage trench during clean-up of incident.	Contaminated soil cleaned up from trench using excavator and placed into dedicated storage area. Oil-water separator pipe to concrete apron on swale drain extended to process water dam. Planned maintenance schedule established for oil-water separator per OEM requirements.
INC182176	04/03/2014	1	EWP hydraulic hose failed on HMC concrete pad – no impact to soil.	Spill contained and cleaned up using spill kit, within 1 hour.
INC200190	04/03/2014	1	Kalari TRT spilt hydrocarbon on HMC pad and failed to clean up. The next truck to arrive found spill and placed kitty litter on it.	Cleaned up immediately. Contractor notified to check all vehicles.
INC183906	18/03/2014	1	Driver reported that diesel was leaking from nozzle at the fuel bowser at Kalari depot. Leak onto concrete area - no impact to soil.	Spill cleaned up; Workshop staff fixed the loose fitting...
INC184594	18/03/2014	1	Grease line failure on front end loader - no impact to soil.	Repairs to equipment completed. New parts ordered.

Incident #	Date	Level	Details	Actions
INC184646	26/03/2014	1	Sykes pump over filled with diesel. Diesel leaked out of filler cap and on to concrete ground – no impact to soil.	Cleaned up within an hour.
INC184652	27/03/2014	1	Dozer DZ909 O-ring for hydraulic fan pump failed. Dozer was parked on slice one until repaired. 2-3 L of oil leaked onto soil.	Cleaned up immediately. Soil placed into contaminated soil skip bin. Dozer O-ring replaced.
INC184649	27/03/2014	1	Whilst re-fuelling hire car diesel spilled as the nozzle did not turn off. An approx. 2-3 L of diesel was spilled and was contained within the bund.	Stopped pump, cleaned up area using spill kit contents, soil removed and disposed to contaminated soil bin.
INC184657	27/03/2014	1	Snap lock fitting on HV hose leaking inside primary containment bund.	Reported and spill cleaned up immediately.
INC184774	28/03/2014	1	Driver was refuelling Kalari loader when nozzle did not click off once the fuel tank reached full. Approx. 9 litres of fuel spilt onto concrete bunded area.	Spill kit material applied and disposed.
INC185782	03/04/2014	1	Oil leak from Kalari TRT between Trailer B and C	Operations stopped, spill contained on concrete, cleaned up and contaminated HMC sent back to JA for reprocessing through the mining unit plant. Repairs completed on truck.
INC185691	03/04/2014	1	Connection in high flow fuel hose at trans tank is seeping diesel into designated concrete bund.	Parts ordered for repair of equipment. Temporary repairs undertaken to connection to stop leak.
INC185754	05/04/2014	1	Less than 500ml of hydraulic oil spilt from DTW09 after leaning over in boggy material.	Tub placed under machine to stop further leaks. Contaminated soil removed and disposed of into contaminated soil bin.
INC185762	05/04/2014	1	Front right ram on hired bobcat has a leak. At present leak is minor but may get worse.	Reported and contacted Coates hire. Bobcat placed out of service. Bobcat repaired by vendor technician.
INC186264	07/04/2014	1	Fuel leak onto gravel at high flow fuel bowser, creating slippery surface. Requires digging up and replacing.	Reported. Cleaned up gravel and disposed to hydrocarbon soil bin.

Incident #	Date	Level	Details	Actions
INC186890	14/04/2014	1	Filled up vehicle with diesel, when removing nozzle from car the handle stuck on and approx. 2 L of diesel spilt on to the ground before it could be switched off.	Spill was contained in fuel bund. Spill was cleaned up immediately and deposed to hydrocarbon soil bin.
INC187185	18/04/2014	1	Hydraulic leak on Mining Unit Plant (MUP) - front LHS track drive line. Minor leak (< 1 L) of hydraulic fluid on fitting under 2nd level.	Contained spill, cleaned up within 1 hour.
INC187218	20/04/2014	1	Oil leak from loose nuts on pump 118 gear box. Spill contained inside / on pump - no impact to bare ground.	Tightened nuts and cleaned up spill using spill pads.
INC187206	20/04/2014	1	Fuel leaking from underneath Geology ute. Approx. 2 L spilt on asphalt car park area.	Secured ute and placed out of service. Cleaned up spill. Vehicle repaired.
INC187212	21/04/2014	1	Hydraulic hose on excavator burst open during MUP move. Approx. 1 L spilt onto bare ground.	Machine isolated and repairs undertaken to the hose. Spill cleaned up. Contaminated soil placed in contaminated soil skip bin.
INC187601	25/04/2014	1	Diesel found in bund at transfer fuel pump. No impact outside of dedicated bund area.	Diesel removed using vacuum truck and disposed into dedicated waste hydrocarbon IBC for off-site recycling.
INC188052	29/04/2014	1	Found small oil leak on the bare ground, behind crane. Upon closer inspection, found that oil filter was weeping. Approx. 0.5 L oil spilt and cleaned up.	Cleaned up straight away. Drip tray placed under crane and repairs completed.
INC188055	29/04/2014	1	Oil leaking from Genset 1 onto concrete ground in power station - approximately 1 L. No impact to soil.	Genset isolated and tagged out of service. Reported to contractor technician. Spill cleaned up.
INC188273	30/4/2014	1	IT loader blew a hydraulic hose. Very minor spill onto bare ground.	IT isolated and tagged out of service. Spill cleaned up. Repairs undertaken on loader.
INC188383	01/05/204	1	Hydraulic hose fitting came loose under cab and started leaking oil.	Stopped machine, contained oil, repairs completed. Cleaned up spill – contaminated soil placed in contaminated soil skip bin.

Incident #	Date	Level	Details	Actions
INC188434	02/05/2014	1	Grease spill (approx 4 L) under digger in stockpile 4.	Digger parked and tagged out of service. Spill cleaned up immediately. Contractor supervisor notified.
INC190598	15/05/2014	1	After loader operator finished loading his truck he noticed an oil leak (approx 0.5L) from one of the lift hoses. Spill occurred on concrete area – no impact to soil.	Spill cleaned up immediately using spill kit – spill kit materials disposed of in general waste. Hose replaced and loader inspected for additional leaks.
INC190519	17/05/2014	1	Hydraulic hose burst after lifting pipe in Process Water Dam (PWD) area, releasing approx. 12 L of oil onto bare ground.	Cleaned up using spill kit. Impacted soil cleaned up and disposed to contaminated soil skip bin. Spill kit materials placed into general waste. No impact to water in the PWD.
INC190530	18/05/2014	1	Small diesel leak (approx. 0.5 L) from fast fill point of DZ932 (dozer) which was parked near workshop.	Placed drip container under dozer to contain spill. Cleaned up impacted soil immediately and disposed to contaminated soil bin. Repairs undertaken on dozer.
INC191560	26/05/2014	1	IT loader burst hydraulic hose spilling less than 5 L onto soil.	Bund erected, scraped up soil and put into contaminated soil bin within 1 hour. Equipment repaired.
INC191566	26/05/2014	1	3 x 44 gallon drums stored on spill pallet on the ground in front of the store. After rainfall, approx 20-30 ml of oil ran onto bare ground.	Contaminated soil removed and placed in contaminated soil skip bin. Drums placed on spill pallet.
INC192561	5/06/2014	1	Oil leaking from Coates hire sump pump at bottom of Ramp C. Minor leakage (approx. 0.5L) onto bare soil.	Cleaned up within 1 hour of discovery.
INC192944	08/06/2014	1	When using the cable reel, approx 50 ml of hydraulic oil leaked onto bare ground.	Stopped using reel, reported and fixed the leak. Cleaned up impacted area.
INC193981	15/06/2014	1	Hydraulic line on digger failed during works at borefield.	Stopped machine. Cleaned up spill using spill kit - cleaned fluid off of boom arm, no spill evident on bare ground.
INC194496	17/06/2014	1	TRT leaked small amount of oil (droplets) onto JA loading pad hardstand.	TRT engine investigated and spill cleaned up at time of discovery.

Incident #	Date	Level	Details	Actions
INC195229	24/06/2014	1	Area of oil patches in the truck parking bay (on bitumen) at end of mine haul road (approx 100 km from JA mine site).	Reported to operations manager. Cleaned up within 1 shift.
INC195449	28/06/2014	2	Diesel leaking, uncontrolled, onto bare ground, during refueling by service cart. Controls available but not used. Total volume spilt approx. 0.5L.	Addressed with operator and contractor management. Cleaned up impacted area.
INC196058	29/06/2014	3	Rainwater ingress around fuel bowser, causing hydrocarbon contaminated water to pond and run-off outside of the bund. Bunds also damaged allowing for ease of run-off outside of the bund. Over time, soil and gravel inside the bund has also become contaminated with diesel. Initial impacted area outside of bund was 1m2, however it was later discovered during clean-up activities that there was contamination underneath the liner.	Bunds repaired. Impacted area cleaned up within 1 month. Approx 800 L of contaminated soil was cleaned up, including the subsequent contaminated soil found underneath the liner of the bund. Review procedures. Refuelling area added to planned weekly inspections (PWIs) schedule (additional to the existing quarterly environment audits completed by the environment team). Project commenced to upgrade transtank design and bunding to ensure full compliance with EPA guidelines.
INC197096	09/07/2014	2	At start-up of DT336 (dump truck) found that hose had blown - approx. 30L of oil spilt.	Cleaned up with spill kit, contaminated soil placed in contaminated soil bin. Reported to supervisor.
INC197191	09/07/2014	1	Minor diesel/oil leak found on ground in mining car park under where survey car was parked. No impact to bare soil. Estimated that approx 200ml was released.	Cleaned up spill with absorbent mats. Vehicle inspected by maintenance department
INC198039	10/07/2014	1	A leaking hydraulic hose was identified on Kalari TRT. No release to soil / ground - spill contained to truck.	Spill cleaned and hose repaired.

Incident #	Date	Level	Details	Actions
INC198034	12/07/2014	1	As Kalari TRT pulled up at fuel pump noticed that there was a trail of diesel from the bowser to the wash bay. Leaks contained on hardstand and bitumen – no impact to bare ground. Estimated spill volume was <1 L.	Reported. Cleaned up spill within 1 hour of discovery.
INC198745	17/07/2014	1	Opened bolt on helicopter fuel jar, 20 ml of fuel spilt onto ground	Cleaned up and bagged contaminated soil. Later disposed of on site, at dedicated soil skip bin.
INC199004	24/07/2014	1	Hydraulic hose failed on right hand side of IT loader while picking up bucket of dirt. Estimated spill volume was 0.5L to bare ground.	Stopped IT, tagged out of service. Cleaned up spill immediately. Contaminated soil placed into contaminated soil bin. Hose replaced.
INC198986	26/07/2014	2	EX413 blew hydraulic hose - approx. 50L of oil spilt onto ground.	Machine shut down and tagged out of service. Spill cleaned up and contaminated soil placed into correct receptacle. Hose repaired.
INC199602	28/07/2014	1	Kalari TRT leaked approximately 1L of diesel on to concrete hardstand at JA HMC loading area.	Spill cleaned up straight away. Fitting repaired. Contaminated HMC reprocessed through the mining unit plant.
INC200280	1/08/2014	1	When operating PTO to unroll the tarps on TRT a small hydraulic fluid leak was noticed. Spill to hardstand approx. 0.5 L.	Spill pads applied and spill cleaned up.
INC199865	02/08/2014	1	While refueling mini digger, spilled approx. 1L of diesel on the ground due to the fuel gun not shutting off when tank was full.	Cleaned up immediately. Reported.
INC199871	02/08/2014	1	PU024 sykes pump running with compressor oil leak.	Shut down pump, contained spill and cleaned up within 1 hour using spill kit. Reported to production coordinator.
INC200174	04/08/204	1	Diesel spill at a genset at the off-path TSF wall. Approx 5-7 L onto bare ground.	Cleaned up spill immediately. Contaminated soil removed and disposed to contaminated soil bin.

Incident #	Date	Level	Details	Actions
INC200343	05/08/2014	1	Fuel nozzle did not auto shut off when tank was full, resulting in overflow of approx 0.1L of fuel onto vehicle only – no impact to soil.	Cleaned fuel off of vehicle using pad.
INC201691	6/08/2014	1	Kalari TRT leaked approx. 50 litres of oil onto cement hardstand area - cleaned up within 1 hour. No impact to soil.	Spill response initiated and faulty hydraulic hose replaced.
INC200821	09/08/2014	1	Oil water separator capture IBC container overflowed. IBC container sited inside concreted hardstand area. Spill contained within wash bay - no impact to soil.	Changed out IBC. Reported.
INC201377	09/08/2014	1	4 L of diesel spilled when refueling Kalari loader. Spill contained within the refueling bund area.	Cleaned up spill and contaminated soil placed into contaminated soil skip bin.
INC203404	10/08/2014	1	Whilst unloading at HMC unloading pad at GRA Port Thevenard, a hydraulic fitting failed causing a hydraulic oil spill of 40 L (onto concrete).	Cleaned up within 1 hour, maintenance personnel inspected loader and made necessary repairs to loader.
INC203395	26/08/2014	1	The driver of TRT 0803 discovered an oil leak on the loading pad from an unknown truck.	Cleaned up immediately upon discovery. Reported to operation manager. Truck repaired.
INC203241	28/08/2014	1	Hydrocarbons leaking onto ground from sykes pump outside Iluka workshop, spill onto sealed hard stand	Maintenance team cleaned up and serviced the pump.
INC203235	28/08/2014	1	Transtank concrete bund contains excess soil contaminated with diesel which is being tracked out on tyres.	Bund cleaned out and hydrocarbon soil residues disposed to contaminated soil skip bin.
INC203340	29/08/2014	1	6mm hydraulic hose on rock breaker failed, causing fluid to leak onto bare soil.	Spill kit used to clean up spill, contaminated soil placed into contaminated soil skip bin. Spill pad used around the attachment while repairs carried out.
INC203664	31/08/2014	1	Small hydraulic leak on contractor trailer at the bore field outside MCC. Spill occurred on bare ground.	Cleaned up spill – placed contaminated material into container and transported to waste transfer station for disposal.

Incident #	Date	Level	Details	Actions
INC204447	5/09/2014	1	Diesel has expanded in tank of Pump 24 and spilled out of the breather. Approx 2 L spilled onto pump deck. No impact to bare soil.	Sucked out diesel to lower the level. Cleaned up spill immediately.
INC204459	5/09/2014	1	Oil decant IBC connected to oil water separator over-topped with recovered oil.	Turned off separator and IBC replaced. Spill contained within bund and directed into wash down bay sump. No impact to bare soil.
INC204465	5/09/2014	1	Spilt small amount of diesel (less than 1 L) when refueling light vehicle. Spill contained within concrete refueling bund.	Cleaned up spill immediately and disposed of appropriately.
INC204666	06/09/2014	1	Waste oil discharged into swale drain due to oil water separator malfunction. Separator had been off, when turned on, oil discharged (< 10 L) into swale drain.	Tagged separator out of service. Contained and cleaned up spill using spill kits. Contaminated soil excavated from area and disposed of in contaminated soil bin. ICAM completed. Actions assigned to make modifications to systems.
INC204186	6/09/2014	1	Waste oil discharged into unsealed swale drain adjacent wash-down bay from oil water separator unit	Spill response initiated and hydrocarbons recovered. Contaminated soils were excavated and disposed to contaminated soil bin.
INC204793	10/09/2014	2	Hydraulic hose failure to EX413 (excavator), approximately 100 L spilt onto ground	Loading stopped immediately and machine shut down & isolated. Reported. Spill cleaned up immediately.
INC204751	11/09/2014	1	Hydrocarbon residue on soil at site of broken down moxy water truck (estimated approx. 2L).	Cleaned up within 1 hour of discovery. Training to workshop staff in regards to checking of equipment after maintenance completed when out in the field.
INC205017	14/09/2014	1	Excavator leaked hydrocarbons onto bare ground whilst parked up.	Cleaned up immediately. Soil disposed to contaminated soil skip bin.
INC206077	21/09/2014	1	Hydraulic line split on Marooka drill rig resulting in a few drops of oil spilling onto bare ground.	Hose repaired; contaminated soil recovered for appropriate disposal to soil bin.

Incident #	Date	Level	Details	Actions
INC206081	22/09/2014	1	A hydraulic return hose began to leak on D31 (drill rig). Several drops soaked onto bare ground.	Hose replaced, spill mats used during the repair. Contaminated soil recovered and disposed to JA contaminated soil bin.
INC206477	24/09/2014	1	Small oil leak from the PTO (approx 0.3L) at the Port Thevenard bunker. Spill confined to concrete hardstand	PTO disengaged to stop the leak. Spill contained using spill kit contents. Cleaned up spill straight away. Repairs to equipment undertaken.
INC206258	24/09/2014	1	Injector on the MUP genset came off spraying diesel inside the engine bay. Spill contained and did not reach the ground.	Reported. Cleaned up spill and repaired and checked injectors.
INC206358	25/09/2014	1	Sykes pump 26 was leaking diesel from the injector line. The diesel leaked onto the skid and then spilt onto the bare ground	Reported and cleaned up spill straight away. Repairs undertaken and injectors checked.
INC206367	26/09/2014	1	Found filter for the day diesel tank leaking diesel into the bunded area.	Cleaned up spill and made maintenance on equipment completed.
INC206580	29/09/2014	1	Whilst pumping diesel into drum during clean-up of existing diesel leak at the power station bund, the transfer hose came out and spilt diesel onto the ground	Reported and removed contaminated soil from the area and placed into contaminated soil skip bin (within 1 hour).
INC207769	07/10/2014	1	Hydraulic fluid leaking from main ram on Kalari loader - possible o-ring failure. Leak onto concrete hardstand - no impact to soil.	Reported to Kalari. Contained and cleaned up within 3 minutes.
INC207929	08/10/2014	1	Hydraulic leak, less than 1 L onto bare ground.	Stopped work, reported and cleaned up within 1 hour. Contaminated soil removed and placed into contaminated soil bin.
INC208065	8/10/2014	1	Split in quick hitch hose on excavator EX45. Spill impacted bare soil.	Stopped excavator and cleaned-up spill. Contaminated soil removed and placed into contaminated soil bin.
INC208068	8/10/2014	1	Small fill hose at transtank fuel bowser drips diesel out of handle. All drips contained within the concrete and poly lining bunds.	Repairs undertaken on equipment. Spill cleaned up with absorbent pads.

Incident #	Date	Level	Details	Actions
INC208550	11/10/2014	1	After service truck had refueled loader noticed small patch of oil on ground (approx 0.1L)	Reported, isolated loader, spill contained and cleaned up immediately.
INC208433	13/10/2014	1	Kalari triple had a radiator hose split – approx. 0.5L released onto concrete hardstand. No soil impact.	Spill cleaned up and hose repaired.
INC208643	14/10/2014	1	Found oil spill outside day crew dome	Cleaned up immediately upon discovery. Contaminated soil removed and placed into contaminated soil bin.
INC208631	15/10/2014	1	Whilst using EWP noticed oil leak (approx. 0.1L) on road. No impact to soil.	Cleaned up immediately. Machine tagged out of service. Maintenance repaired equipment.
INC209501	24/10/2014	1	Hydraulic line failure on drill rig (31). <1 L spilt onto bare ground.	Stopped work, isolated, spill mat containment, soil bagged and repairs commenced. Contaminated soil placed into contaminated soil bin.
INC209959	29/10/2014	1	Service truck spilt approx 2 L of diesel in concrete bund when filling truck.	Bucket was in place to catch any drips. Spill cleaned up straight away.
INC210359	30/10/2014	1	Grease leaking from hose reel	Contained within the container – no impact to bare ground. Cleaned up with pad.
INC210882	5/11/2014	1	Oily patch on ground out the front of the Exact Workshop (<1L).	Cleaned up within 1 hour of discovery. Contaminated soil removed and placed into contaminated soil bin.
INC211545	12/11/2014	1	TRT 776 finished unloading at Thevenard HMC bunker - small oil spill (approx. 0.1L) discovered on cement apron.	Cleaned up immediately with absorbent pads from spill kit. Notified GRA.
INC214137	26/11/2014	1	EX413 (excavator) had a slew motor failure resulting in a hydraulic leak spilling less than 10L onto the bare ground, all other oil was contained within slew ring.	Isolated equipment. Contained spill and captured excess spillage with container. Cleaned up spill within 1 hour. Equipment repaired.
INC213474	29/11/2014	1	Oil spill on HMC loading pad hardstand. Approx. 0.1L found on arrival to HMC area.	Cleaned up immediately upon discovery.

Incident #	Date	Level	Details	Actions
INC213459	29/11/2014	1	Hydraulic leak from LHS ram of drill rig.	Reported. Tagged out of service and cleaned up spill straight away.
INC213871	1/12/2014	1	Patch of oil/diesel left on ground where pump was located at the bottom of Ramp E – approx. <5L.	Cleaned up within 1 hour of discovery.
INC213843	2/12/2014	1	PU119 oil has leaked from gear box since last check by maintenance team. Oil to ground, approx 250ml	Absorbent granules and pads used to clean up spill. Cleaned up within 1 hour of spill being identified.
INC214784	02/12/2014	1	During mechanical repairs, diesel leak of < 1L occurred.	Cleaned up immediately. Contaminated soil removed for appropriate disposal.
INC215573	15/12/2014	1	EX413 (excavator) slew feed hose blew, whist loading haul truck out of block 62, resulting in a spill of approx 10L to bare ground.	Oil was contained, digger was shut down immediately. Spill cleaned up.
INC215934	20/12/2014	1	Mack water truck had a small leak in hydraulic hose. When used down at drainage a small mist of oil was sprayed out (< 2 L).	Turned off PTO to stop leak. Contaminated soil cleaned up within 30 minutes. Repairs undertaken in workshop.
INC216347	26/12/2014	1	Excavator blew o ring and lost 8-10Lts of oil in brown loam excavation area.	Equipment shut down. Cleaned up immediately. Contaminated soil removed and placed into contaminated soil bin. Excavator o ring was replaced.
INC216290	28/12/2014	1	Engine leaking from bottom of Sykes pump	Reported. Cleaned up spill immediately once identified. Contaminated soil removed and placed into contaminated soil bin. Spill kit waste disposed of in general waste.
INC216499	31/12/2014	1	Hydraulic hose failure. Approx. 0.1 L spilt onto bare ground.	Stopped work, cleaned up spill, reported and repaired hose
Chemical Spills				
INC188068	29/04/2014	1	Noticed two puddles of substance on the ground outside of site toilets - presumed to be cleaning product residue that has been washed out.	Cleaned up and impacted soil removed. Procedures reviewed. Toolbox training to contractor to communicate correct disposal methods.

Incident #	Date	Level	Details	Actions
INC200327	04/08/2014	1	At JA HMC pad, Kalari TRT driver discovered a patch of coolant on hardstand from previous truck.	Cleaned up with spill kit immediately and reported to contractor supervisor. Previous driver contacted – he completed a road-side check – no issues found. Workshop staff checked truck upon return to depot and found that the coolant had been overfilled.
INC200909	9/08/2014	2	Evidence of a leak (dry white residue) of caustic at the RO plant. Impact to bare soil of approx <10L.	Investigated source of discharge. Washing hose was found to be outside of bund area - containers were washed outside of the bund area by contractor. Residue cleaned up straight away. Soil placed into contaminated soil bin. Training with relevant contractor. Permit to work system extended to cover activities in the RO plant area.
INC204555	8/09/2014		Ant insecticide bottle found in chemical store outside of spill pallet, it also had a minor leak. Spill contained in card board box. No impact to soil.	Cleaned up spill. Placed back onto spill pallet.
INC208237	08/10/2014	1	Damaged hose on vehicle, causing small amount of coolant to leak on ground (20ml).	Spill cleaned up. Repairs undertaken. Reminder to all staff re pre-start checks.
INC208547	13/10/2014	1	When loading TRT at JA, operator noticed there was coolant leaking from truck engine bay onto the loading pad. No impact to soil.	Stopped loading and reported to Kalari. Repairs undertaken at JA by Exact. Spill cleaned up straight away.
Inappropriate Hydrocarbon / Chemical Storage				
INC191566	26/05/2014	1	3 x 44 Gallon oil drums stored on a pallet on the ground in front of store. Approximately 20-30ml of oil ran onto the ground with wet weather	Leak cleaned-up and drums relocated to correct spill pallet storage. Soil removed and disposed to hydrocarbon skip bin.
INC192584	05/06/2014	1	Bund holding water at diesel storage tank facility. Sump is blocked.	Sump unblocked. Excess residue pumped out.

Incident #	Date	Level	Details	Actions
INC201756	16/08/2014	1	In-ground sump at diesel trans tank is not being maintained. Found full of hydrocarbons, therefore no capacity to capture run-off/spills.	Sump pumped out and placed into designated waste hydrocarbon IBC.
INC201759	16/08/2014	1	Trans tank bund full of water/diesel emulsion and not being maintained	Pumped out by Exact. Waste diesel stored in designated waste hydrocarbon storage area. Recycled off site.
INC216066	21/12/2014	1	Hydrocarbon container left outside of designated hydrocarbon sea container	Replaced into sea container. Reported to relevant contractor.
Saline Spills				
INC217151	8/01/2014	1	Leaking Seal at Manifold at IH 58, Approximately 1L of Saline Water spilt within existing salinized impact footprint	Turned off the main valve to stop the leak. Repairs completed.
INC176645	16/01/2014	1	Leaking air breather valve at borefield within fenced compound – no impact tot vegetation.	Reported to maintenance. Repairs undertaken.
INC176888	19/01/2014	3	Gasket failed at AV03 resulting in saline water being released outside of the mine lease. The water jet was approx 10m long in a northerly direction. Area impacted was approx. 0.033 hectares. Most of the water had pooled along the borefield road windrow (approx 50 metres long, running east – west).	Maintenance team attended incident straight away and turned off valve. DMITRE (DSD) notified. ICAM root-case failure completed. Stock inventory of gasket seals addressed. Procedures reviewed and workshopped with maintenance fitters regarding timing and frequency of gasket seal replacement.
INC177339	21/01/2014	1	Saline water leak from borefield transfer pump. Spill limited to the immediate area surrounding the transfer pump – no impact to vegetation.	Turned off bore transfer pump to check valve complex. Repairs undertaken.
INC178495	3/02/2014	1	Mining hose for return water from field water tank has a pin hole and hose is leaking saline water onto bare ground.	Production coordinator contacted. Repairs undertaken.
INC179088	8/02/2014	1	Dripping vent valve AV31; drip contained in valve area – no impact to vegetation	Reported to maintenance. Repairs undertaken.

Incident #	Date	Level	Details	Actions
INC179091	8/02/2014	1	Found AV39 dripping; isolated valve; put notification in - system to be repaired	Reported to maintenance. Repairs undertaken.
INC182442	4/03/2014	1	Water cart spraying saline water on top of over burden at south brown loan area – ramp and excavation pit only. No impact to clean overburden stockpile.	Water cart operator notified. Training provided to operator.
INC183814	19/03/2014	1	Slow saline water drip at V2042/V0241 flange at Borefield Bore - drip on concrete. No impact to soil.	Maintenance notified and repairs undertaken.
INC184108	23/03/2014	1	Saline groundwater overflowing from field water tank - water flowing along drain and into catchment sump. Impact was contained within salinized drain / pipeline corridor. No impact to vegetation.	Stopped tank overflowing and reported to shift coordinator. Monitored to ensure containment stayed within existing pipeline corridor / drain.
INC188256	29/04/2014	1	HMC stacker 3 water building up around bunding and water running down access road. No impact to vegetation.	Moved stacker around and bunding repaired.
INC189755	11/05/2014	1	Excessive sediment load in swale drain to return water dam following power outage. Minor overflow of saline process water outside drain - No vegetation impacted and all contained in impact footprint.	Cleaned up excess sediment with digger.
INC191186	22/05/2014	1	TSF Bore Pump (IH18) is leaking at the flow metre flange. Leak contained within the salinized impact footprint.	Bore isolated. Reported to maintenance. Repairs undertaken.
INC193093	8/06/2014	1	Found air vent valve leaking on bore 107. Minimal spillage in bunded area. No impact to vegetation.	Valve shut. Reported to supervisor. Valve replaced.
INC194490	17/06/2014	2	While dewatering bore line to soakage pits, pits 8 & 11 were over filled resulting in saline water release onto vegetation. Spill contained within mine lease boundary.	Shut down all valves. Toolbox topic on saline water management provided to project work team at prestart. Developed JHA and TWI for dewatering of boreline to pits.
INC198149	19/07/2014	1	Saline water slowly leaking (dripping) from borefield pump. All water within concrete pad area - no impact to bare soil.	Reported to maintenance. Repairs undertaken.

Incident #	Date	Level	Details	Actions
INC198983	22/07/2014	2	Started pump generator IH62 which had been tagged and isolated out of service. This caused the gasket to come off of pump causing saline water to spill onto bare ground. Spill was contained to immediate area and access road, which is an existing salinized area. Minimal impact to vegetation which had re-grown in a previously cleared area. The approximate area of impact was 60m2.	Genset shut down. Valve shut and bolts tightened to stop leak. Re-training of team who did not follow existing procedures.
INC199832	1/08/2014	1	Leaking boreline air valve (AV03) - minimal (<10L) saline water spill within salinized boreline corridor.	Reported to maintenance. Air valve replaced and tested.
INC200892	10/08/2014	1	Minor saline leak from pressure gauge at TSF dewatering bore – spill contained to manifold and within salinized pipeline corridor for dewatering bores. No impact to soil or vegetation.	Reported to maintenance. Shut down pump and closed knife gate valve. Repairs undertaken.
INC202516	19/08/2014	1	AV57 discharging through top air vent valve. Boreline was isolated at the time. Cause may have been due to drop in pressure due to boreline isolation. Saline water contained within salinized pipeline corridor – no impact to vegetation.	Isolated valve and reported. Register developed for bores which discharge when boreline is isolated to inform valve closure as part of boreline isolation planning.
INC203097	23/08/2014	1	Tap at bore transfer pump dripping saline water onto concrete with no impact to surrounding area.	Turned tap off and reported to Iluka maintenance coordinator.
INC203116	28/08/2014	1	Leaking flange on TSF Bore IH61. Very minor saline impact to soil (<2L). Saline water was confined to existing salinized disturbed footprint. No impact to vegetation.	Saline water leak addressed within the hour and leaking flange repaired.

Incident #	Date	Level	Details	Actions
INC204658	6/09/2014	1	When pulling back loose soil and rocks from trench adjacent to bore line with excavator, loose rock rolled into trench and contacted bore line. The impacted pipe line began to weep saline water. <1 L seeped onto soil.	Reported. Bore line isolated. Isolated IV3 and bleed line into scour valve sumps so repairs could be undertaken.
INC204843	12/09/2014	1	Saline process water from PC12 flooding into soakage trench next to return water dam.	Reported. Water drained to adjacent PC12 culvert drain. Drain to soakage trench bunded to stop overflow from PC12 culvert drain into soakage trench.
INC205405	15/09/2014	1	RO raw water tank leaking saline water onto concrete pad – no impact to soil or vegetation	Notified process owner. Repairs undertaken.
INC205815	17/09/2014	1	Rubber gasket on AV01 failed during pigging run. Saline water sprayed on road (existing salinized area). No impact to vegetation.	Stopped pigging operation, isolated valve to stop leak and notified site manager.
INC206246	22/09/2014	1	AV40 at bore field leaking saline water.	Saline water was confined to existing salinized disturbed footprint around the valve. No impact to vegetation. Reported. Valve repaired.
INC208241	10/10/2014	1	2 x air vents leaking (AV5 and AV11). Air vent valves were full of loose scale which stopped valve from re-sealing properly. Spillage of saline water approx. 1.5m around valve. No impact to vegetation.	Valves isolated and repaired on discovery.
INC209696	26/10/2014	1	Very slow drip on IH18, no pool of water, only a slight salt stain on soil. No impact to vegetation.	Reported. Leak fixed by maintenance.
INC210913	4/11/2014	1	Saline water incorrectly used on brown loam stockpile 07	Reported; Operators re-trained on saline water use guidelines.

Incident #	Date	Level	Details	Actions
INC212918	24/11/2014	1	Saline spill from TSF off path bores onto Haul Road and along pipe line corridor. Approx. 5 m3. Spill contained within existing salinized pipeline corridor - no impact to vegetation.	Turned off all bores and isolated valves. Placed out of service tags on valves.
INC215579	13/12/2014	2	Air valve on AV57 of boreline was stuck open resulting in uncontrolled release of approx. 1000L of saline process water in previously cleared (impacted) area – no impact to vegetation. Saline water was contained within the salinized pipeline corridor.	Contacted control room to shut off valve. Unsatisfactory re-seating of gasket valve during previous programmed maintenance inspection of valve identified as incident cause. Technicians re-trained in correct gasket maintenance.
Effluent Spills				
INC189339	7/05/2014	2	Village WWTP humus tank overflowed (100L) on to unsealed ground, causing end tank to lift out of ground. Cause was due to scum build up in primary tank 3 weir box – this was impeding water flow into next stage of system (rotating discs system). Sludge build-up also evident in humus draw-off tank causing flow restrictions and back-up of water in this tank.	Manual operation of humus tank pump to reduce water level in tank. Training of technicians in routine inspection and cleaning of weir box and humus draw-off tank to ensure flows are maintained. Organised repairs to end tank. End tank secured in ground with cement and pegs. Culvert drain installed to capture potential run-off. Planned maintenance schedule for 3 monthly maintenance inspections by plumbing contractor.
INC204757	4/09/2014	2	Mine WWTP effluent pump seized due to unknown blockage, causing 50 L of effluent to spill onto bare ground. High level alarm provided immediate notification to site control room and maintenance team to attend the plant.	Pump isolated and spare sump pump installed temporarily. Area was barricaded. Spill was contained and exposed to natural UV radiation to render the spill inert and no risk to human health. (Physical clean-up of spill was deemed to more a human health risk). Maintenance fixed the pump within 1 hour. Back-up pump also installed.

Incident #	Date	Level	Details	Actions
INC204801	11/09/2014	2	Partially treated effluent splashing from rotating disc system onto bare ground. Very minor spill, no pooling of water, only a wet patch (1m x 1m).	Disc system cleaned to reduce the excess build-up of scum on the plates. Inspection check sheet amended to include this in regular housekeeping tasks.
INC206813	29/09/2014	2	Rotating discs at village WWTP splashing, resulting in small amounts of partially treated effluent splashing from tank.	Disc system cleaned. Maintenance regime increased and documented on check-sheet. Training of technicians. Contractor organised to attend site for de-sludging of system.
INC209507	24/10/2014	2	During inspection at village WWTP found evidence of waste water overflow (wet ground – no pooling).	Contractor mobilised to de-sludge tanks and rotating disc system to resolve issue of excess humus/scum build-up in the system and back-flow / overflow. Inspection check-sheets updated to include inspection of flow pipe outlets.

Table 3 Public safety incidents reported via LCC, 2014

Incident #	Date	Level	Details	Actions
Vehicle Interactions				
14/01/2014	INC176686	1	Whilst travelling to JA in truck, a west bound semi-trailer overtook TRT on an approaching blind corner	Reported
22/01/2014	INC177406	1	Kalari TRT west bound had to apply harsh brakes and move to left hand shoulder to avoid on coming B-Triple that was overtaking on a blind bend	Reported
28/01/2014	INC178105	1	While unit 0835 was travelling east past he Nundroo Roadhouse a vehicle pulled out of the roadhouse, heading east, cutting off the road train and causing a near miss	Reported

Incident #	Date	Level	Details	Actions
26/03/2014	INC184539	1	3rd party semi-trailer trying to overtake a Kalari road train on two occasions, on the crest of hills both times. Oncoming traffic had to move to the road shoulder on both occasions.	Reported
26/03/2014	INC184536	1	On approach to Penong from the west a Kalari triple road train was overtaken on a LHS bend with no clear forward vision	Reported
8/04/2014	INC186389	1	B Double travelling east passed Kalari TRT on a blind bend in the road	Reported
2/05/2014	INC189447	1	Vehicle overtook road train immediately after passing through heavy rain, causing oncoming vehicle to break. The same vehicle overtook again 25 minutes later with zero visibility due to hill in road	Reported
7/05/2014	INC189458	1	East bound road train passing caravan at unsafe time, Kalari TRT has to brake to avoid collision with overtaking road train.	Reported
7/05/2014	INC189461	1	Travelling East towards Penong when a GKR B Double past a Kalari TRT on a blind section of highway. Also while passing the GKR driver kept moving over the centre line forcing the Kalari TRT driver to move over.	Reported
18/05/2014	INC190589	1	As the driver came over a rise, he met with a GKR road train overtaking a mobile home.	Reported
18/05/2014	INC190586	1	A white van pulled out in front of TRT 0837 from the Coorabie turn off	Reported
22/05/2014	INC191228	1	In Thevenard, Kalari driver looked both ways for traffic at a corner, no vehicles were coming so the driver of the TRT started to move off to turn, a light vehicle came around the bend and driver had to stop to let the light vehicle pass.	Reported

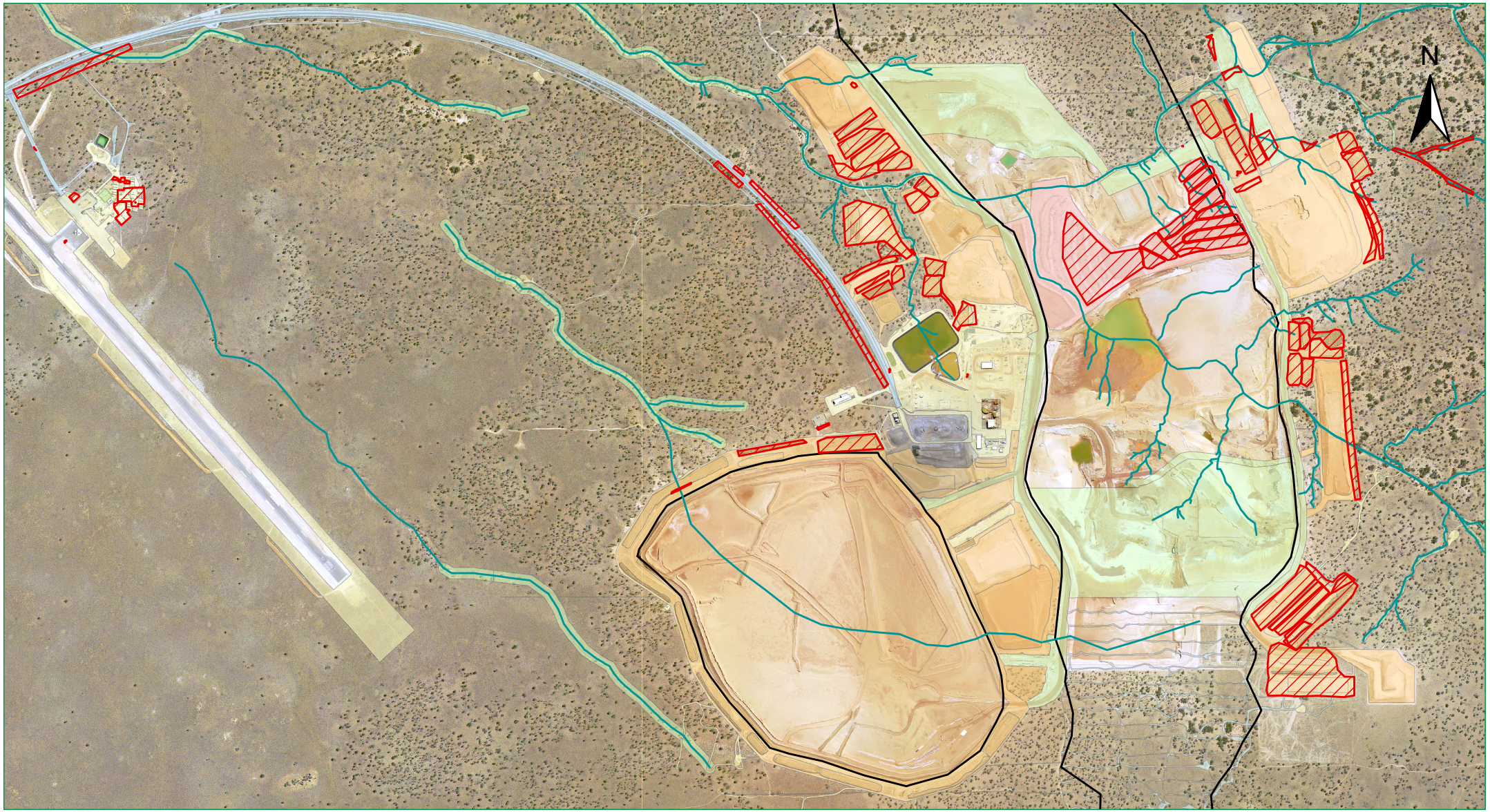
Incident #	Date	Level	Details	Actions
23/05/2014	INC191231	1	Fog creating visibility issues for Kalari truck driver, leaving only 20m visibility when accessing haul road from Eyre Highway. Upon turning corner was faced with oncoming traffic but managed to stop in time.	Reported
24/06/2014	INC194845	1	Kalari driver witnessed a member of the public driving dangerously. Vehicle attempted U turns, reversed on haul road, tailgated and over took in a dangerous manner.	Reported
14/07/2014	INC198137	1	Kalari TRT driver turned onto Eyre Highway travelling east, after approximately 4km a car carrier over took 200m from bend on blind corner	Reported
3/08/2014	INC200294	1	B Double truck overtook Kalari TRT on Eyre Highway on a blind corner with no call up or acknowledgement. Oncoming car appeared and Kalari driver was forced to brake and car came to a complete stop to allow truck past.	Reported
9/08/2014	INC201673	1	Truck overtook Kalari TRT on a blind corner	Reported
18/08/2014	INC202209	1	Whilst driving through Ceduna a vehicle pulled out in front of Kalari TRT	Reported
20/08/2014	INC203280	1	While travelling west toward Nundroo, a west bound IPEC B Double passed the Kalari TRT Driver on the crest of a hill with traffic coming towards the B Double travelling east.	Reported
22/08/2014	INC203365	1	Road train passed Kalari TRT with no radio communication when there was oncoming traffic	Reported
4/09/2014	INC206417	1	Kalari TRT driver witnessed car driving erratically on the Eyre highway with unrestrained child in the back of the car	Reported

Incident #	Date	Level	Details	Actions
12/09/2014	INC205873	1	Camper van pulled out in front of Kalari TRT from the right hand side of road whilst travelling east	Reported
17/09/2014	INC205864	1	Truck from another company pulled out in front of Kalari TRT without due care	Reported
23/09/2014	INC206459	1	Car with caravan trailer pulled out in front of Kalari TRT on Eyre Highway	Reported
29/10/2014	INC209978	1	Red star double road train over took east bound Kalari TRT approaching blind bend	Reported
29/10/2014	INC209973	1	Heading South in TRT, overtaken by a twin cab Hilux displaying P plates, over double lines and blind crest	Reported
30/10/2014	INC210413	1	Heading down a big straight, east bound between a big sweeping bend and a parking bay at the bottom of Buds Hill, a redstar road train pulled in too early while overtaking.	Reported
7/11/2014	INC211555	1	Kalari TRT stopped at rail crossing. When proceeding to cross and continue to port facility a light vehicle failed to give way where required.	Reported
Pedestrian Interactions / Safety				
4/02/2014	INC178725	1	Kalari driver was returning to depot at end of shift when he noticed a pedestrian sitting on the road (Schwartz Road)	Driver slowed down and moved to right hand side of road to pass safely. Reported.
7/04/2014	INC186585	1	TRT Driver almost didn't see a man in a wheelchair at night time in the lane of a street; he was wearing dark clothing and did not have a light. Driver only identified man in the flashing light of truck indicator.	Driver stopped to let man pass safely before entering depot. Reported.
7/05/2014	INC189442	1	Intoxicated woman walking on the road over the fog line in the west bound lane (1km west of Ceduna)	Driver passed the pedestrian safely and reported.
21/05/2014	INC191224	1	Kalari driver noticed group of intoxicated people just off the edge of the road coming in to Ceduna	Driver reported to supervisor who notified local police who attended the scene.

Incident #	Date	Level	Details	Actions
19/06/2014	INC194592	1	When travelling back to Ceduna from JA in Kalari light vehicle, was faced with two pedestrians on the road. Driver had to break hard to avoid contact.	Driver notified other drivers via supervisor. Reported.
30/06/2014	INC196201	1	Kalari TRT driver came across a group of intoxicated people fighting on the road at the front of BP in Ceduna.	Supervisor notified and emergency services notified who attended the scene. Other drivers notified.
3/07/2014	INC197152	1	Whilst slowing down while approaching the Ceduna fruit fly station driver noticed two pedestrians walking along the fog line approximately 5 meters in front road train.	Driver took evasive action to avoid pedestrians and following vehicle. Reported to supervisor and police notified.
3/07/2014	INC196197	1	Kalari TRT driver spotted a pedestrian sitting on the road when travelling to JA Mine site just past the fruit fly. Truck veered safely to RHS of road to pass.	Driver veered safely to avoid collision. Supervisor notified and police informed.
1/08/2014	INC200274	1	Pedestrian walking in the middle of road lane opposite to Kalari TRT. Pedestrian was wearing dark clothing making it difficult to see them.	Reported to supervisor.
9/08/2014	INC201676	1	Kalari truck had a near hit with pedestrian (hitch hiker) on edge of highway, 50km from Nundroo.	Supervisor and police notified.
13/08/2014	INC201703	1	Pedestrian on the highway, 1km west of Ceduna fruit fly inspection point	Alerted oncoming traffic and notified Ceduna police.
21/08/2014	INC203625	1	Pedestrians on Eyre Highway	Police notified; Supervisor attended scene to address safety risk with pedestrians in question.
21/08/2014	INC203355	1	One adult male staggered across the road in path of Triple Road Train	Driver slowed safely to allow pedestrian to cross road. Supervisor notified.
23/08/2014	INC203362	1	Farmer pushed out a flock of sheep between two TRT's causing Kalari driver to brake suddenly and come to almost a complete stop before the sheep were off the road.	Reported.

Incident #	Date	Level	Details	Actions
20/09/2014	INC206378	1	Returning from JA on Thevenard Road, TRT lights on low beam, pedestrian appeared, walking towards truck. When driver took evasive action the pedestrian stepped off road resulting in a near hit.	Supervisor notified; mobile assistance (MAP) bus called but advised not operating. Called police to attend scene.
23/09/2014	INC206471	1	Returning to Ceduna from JA in TRT, a male person was sitting on LHS of fog line. Person dressed in light colored clothing. A lot of highway traffic.	Supervisor notified and police informed.
18/10/2014	INC209060	1	Driver noticed a pedestrian waiting on LHS of the road. As the prime mover went past, they began moving towards the path of another road train travelling behind them.	Reported.
28/11/2014	INC213646	1	Kalari TRT 802 returning to unload at port facility and noticed a pedestrian walking on the side of Eyre Hwy, 4km from Ceduna.	Reported to supervisor.

APPENDIX B WEED MAPPING & MANAGEMENT PROGRAM 2014



Legend

- 2014 Weed Management
- Creeks_in_ML
- Pit Outline
- A Rehab Areas
- B Stockpiles
- C Frequent Off Site Vehicles
- D Disturbed Landscape Priorities
- E Undisturbed Landscape Priorities

MGA Coordinates, GDA94

Weed Management Areas 2014

ILUKA

ORIG: DRAWN: T Law SCALE: 1:18,577 (A4) DATE: 19/03/2015 DWG No:

FIGURE: 1

APPENDIX C WASTE AND HYDROCARBON RECORDS

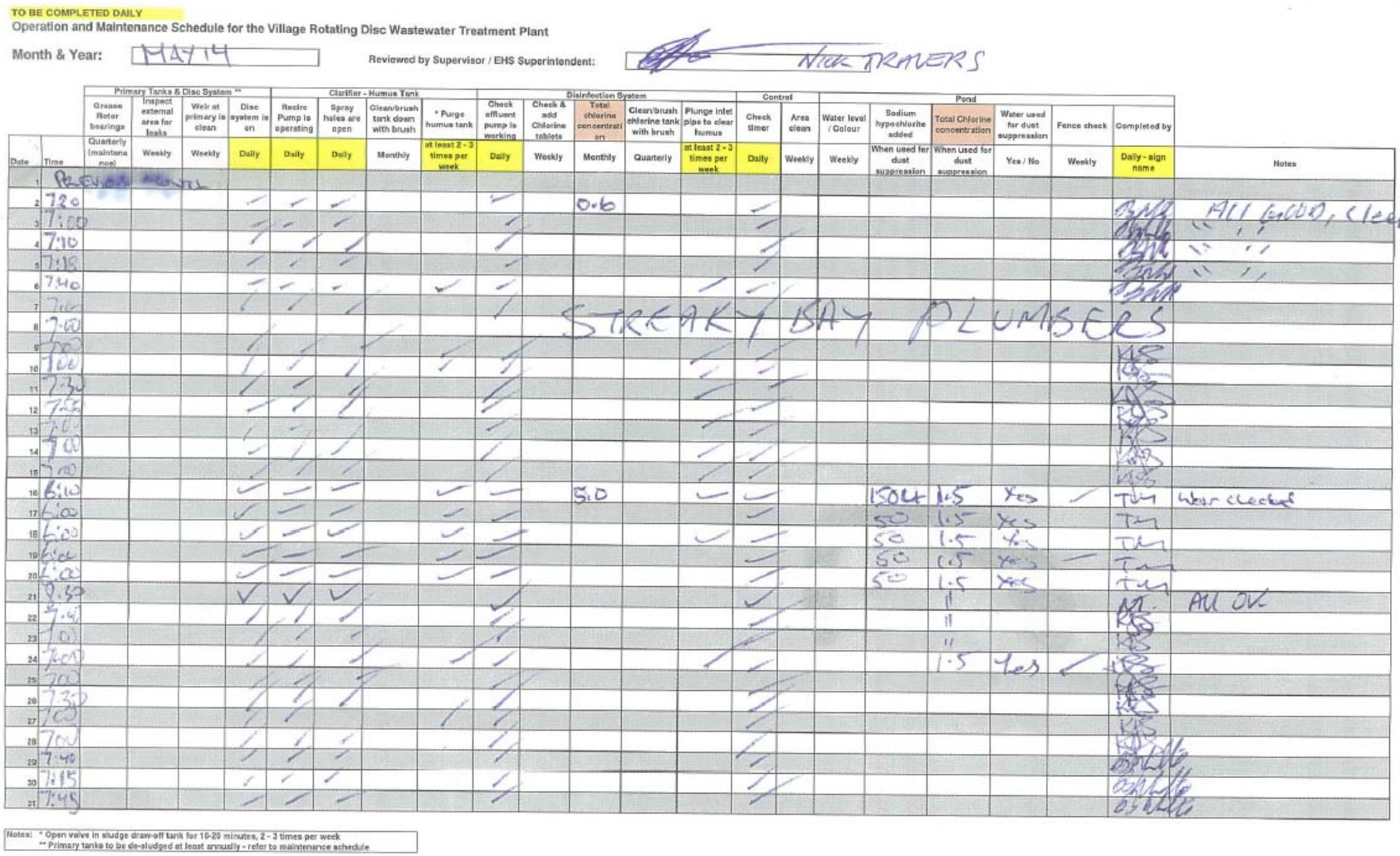
Iluka Jacinth-Ambrosia – Waste Movement Register

(Extract Only)

WASTE MOVEMENT RECORD 2014

					COLLECTED		RECYCLED				DISPOSED															
DATE	DATE	WASTE STREAM	WASTE DESC / COMMENT	SOURCE	Skip (Tonne	Skip (m3)	Each	Litres	Tonnes	m3	Litres	Tonnes	m3	TRANSPORT CONTRACTOR	VEHICLE REG N	EPA #	TRANSPORT CONTRACTO	VEHICLE REG N	EPA #	DESTINATION	DESTINATION EPA #	WTC / WTF FORM #	MPS NAME	WASTE CAT
2014	04/01/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	0.8	13						0.8	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	04/01/14	Timber	timber stillages	Iluka	0.58	15			0.58	15				Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Recycling	13480	---	Timber	Inert
2014	16/01/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	1	13						1	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	20/01/14	Recycling	paper/cardboard	Iluka	0.45	20			0.45	20				Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Recycling	13480	---	Mixed Recycling	Inert
2014	20/01/14	Solid	SOLID waste EXACT	Exact	3.5	13						3.5	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	23/01/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	1.1	13						1.1	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	30/01/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	1.6	13						1.6	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	06/02/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	0.95	13						0.95	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	06/02/14	Recycling	paper/cardboard	Iluka	0.4	20			0.4	20				Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Recycling	13480	---	Paper Cardboard	Inert
2014	13/02/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	1.1	13						1.1	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	20/02/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	0.96	13						0.96	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	20/02/14	Metal	metals mixed	Iluka	5.6	10			5.6	10				Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Recycling	13480	---	Scrap Metal	Inert
2014	24/02/14	Metal	metals mixed	Iluka	4	10			4	10				Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Recycling	13480	---	Scrap Metal	Inert
2014	24/02/14	Timber	Timber/pallets	Iluka	0.8	15			0.8	15				Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Recycling	13480	---	Timber	Inert
2014	25/02/14	Recycling	paper/cardboard	Iluka	0.64	20			0.64	20				Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Recycling	13480	---	Paper Cardboard	Inert
2014	25/02/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	1.6	13						1.6	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	06/03/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	0.95	13						0.95	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	13/03/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	1.1	13						1.1	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	14/03/14	Solid	solid workshop waste exact	Exact	2.7	13						2.7	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	14/03/14	Recycling	Paper/Cardboard/Plastics	Iluka	0.7	20			0.7	20				Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Recycling	13480	---	Mixed Recycling	Inert
2014	20/03/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	1.7	13						1.7	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	27/03/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	1.3	13						1.3	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	29/03/14	Recycling	Paper/Cardboard/Plastics	Iluka	0.8	20			0.8	20				Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Recycling	13480	---	Mixed Recycling	Inert
2014	03/04/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	0.9	13						0.9	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	03/04/14	electrical goods	televisions/remotes	Iluka	2.1	15			2.1	15				Ceduna Can & Bottle	SB18CT	13480	---	---	---	Enviroocycle	24482	---	E-Waste	Inert
2014	10/04/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	1.6	13						1.6	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	16/04/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	1.1	13						1.1	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	22/04/14	recycling	Paper/Cardboard/Plastics	Iluka	0.8	20			0.8	20				Ceduna Can & Bottle	WIU443	13480	---	---	---	Ceduna Recycling	13480	---	Mixed Recycling	Inert
2014	24/04/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	0.95	13						0.95	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	24/04/14	medical waste	medical/needles/bandages	Iluka	0.045	0.25						0.045	0.25	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Veolia Incinerator	2672	5319810	Medical Waste	Listed Haz
2014	01/05/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	1.1	13						1.1	13	Ceduna Can & Bottle	WIU443	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	08/05/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	1.3	13						1.3	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	09/05/14	Solid	SOLID WASTE/ Exact mining	Exact	2.8	13						2.8	13	Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert
2014	09/05/14	metal recycling	metal / mixed	Iluka	4.8	10			4.8	10				Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Recycling	13480	---	Scrap Metal	Inert
2014	09/05/14	recycling	Paper/Cardboard/Plastics	Iluka	0.8	20			0.8	20				Ceduna Can & Bottle	SB18CT	13480	---	---	---	Ceduna Recycling	13480	---	Mixed Recycling	Inert
2014	15/05/14	Solid/putrescible waste	FOOD /SOLID WASTE	Iluka	0.9	13						0.9	13	Ceduna Can & Bottle	WIU443	13480	---	---	---	Ceduna Landfill	3070	---	General Waste	Inert

Iluka Jacinth-Ambrosia - Wastewater Treatment Plant (WWTP) Daily Inspection Log Sheet



TO BE COMPLETED DAILY

Operation and Maintenance Schedule for the Village Rotating Disc Wastewater Treatment Plant

Month & Year: MAY 14

Reviewed by Supervisor / EHS Superintendent: NICK TRAVERS

		Primary Tanks & Disc System **				Clarifier - Humus Tank				Disinfection System					Control		Pond						
		Grease Rotor bearings	Inspect external area for leaks	Weir at primary is clean	Disc system is on	Recirc Pump is operating	Spray holes are open	Clean/brush tank down with brush	* Purge humus tank	Check effluent pump is working	Check & add Chlorine tablets	Total chlorine concentration	Clean/brush chlorine tank with brush	Plunge inlet pipe to clear humus	Check timer	Area clean	Water level / Colour	Sodium hypochlorite added	Total Chlorine concentration	Water used for dust suppression	Fence check	Completed by	
Date	Time	Quarterly (maintenance)	Weekly	Weekly	Daily	Daily	Daily	Monthly	at least 2 - 3 times per week	Daily	Weekly	Monthly	Quarterly	at least 2 - 3 times per week	Daily	Weekly	Weekly	When used for dust suppression	When used for dust suppression	Yes / No	Weekly	Daily - sign name	Notes
1	PREVIOUS MONTH																						
2	7:20				✓	✓	✓			✓		0.6			✓								
3	7:00				✓	✓	✓			✓					✓								ALL GOOD, CLEAR
4	7:10				✓	✓	✓			✓					✓								" "
5	7:15				✓	✓	✓			✓					✓								" "
6	7:40				✓	✓	✓		✓	✓				✓	✓								
7	7:40				✓	✓	✓			✓		STREAKY BAY PLUMBERS											
8	7:00				✓																		
9	7:00				✓	✓	✓			✓					✓								
10	7:00				✓	✓	✓		✓	✓				✓	✓								
11	7:30				✓	✓	✓			✓				✓	✓								
12	7:25				✓	✓	✓			✓				✓	✓								
13	7:00				✓	✓	✓			✓				✓	✓								
14	7:00				✓	✓	✓			✓				✓	✓								
15	7:00				✓	✓	✓			✓				✓	✓								
16	6:30				✓	✓	✓		✓	✓		5.0		✓	✓			150L	1.5	Yes	✓	TM	Water checked
17	6:00				✓	✓	✓		✓	✓					✓			50	1.5	Yes		TM	
18	6:00				✓	✓	✓		✓	✓				✓	✓			50	1.5	Yes		TM	
19	6:00				✓	✓	✓		✓	✓					✓			50	1.5	Yes	✓	TM	
20	6:00				✓	✓	✓		✓	✓					✓			50	1.5	Yes		TM	
21	9:30				✓	✓	✓			✓					✓				11			MT	ALL OK
22	7:40				✓	✓	✓			✓					✓				11			KS	
23	7:00				✓	✓	✓			✓					✓				11			KS	
24	7:00				✓	✓	✓		✓	✓				✓	✓				1.5	Yes	✓	KS	
25	7:00				✓	✓	✓			✓					✓							KS	
26	7:30				✓	✓	✓			✓					✓							KS	
27	7:00				✓	✓	✓		✓	✓					✓							KS	
28	7:00				✓	✓	✓			✓					✓							KS	
29	7:40				✓	✓	✓			✓					✓							DR	
30	7:15				✓	✓	✓			✓					✓							DR	
31	7:45				✓	✓	✓			✓					✓							DR	

Notes: * Open valve in sludge draw-off tank for 10-20 minutes, 2 - 3 times per week
** Primary tanks to be de-sludged at least annually - refer to maintenance schedule

TO BE COMPLETED DAILY

Operation and Maintenance Schedule for the Village Rotating Disc Wastewater Treatment Plant

Month & Year: 01/01/2014 **Reviewed by Supervisor / EHS Superintendent:** NICK TRAVERS 10/2/14.

		Primary Tanks & Disc System **				Clarifier - Humus Tank				Disinfection System					Control		Pond						
		Grease Rotor bearings	Inspect external area for leaks	Weir at primary is clean	Disc system is on	Recirc Pump is operating	Spray holes are open	Clean/brush tank down with brush	* Purge humus tank	Check effluent pump is working	Check & add Chlorine tablets	Total chlorine concentration	Clean/brush chlorine tank with brush	Plunge inlet pipe to clear humus	Check timer	Area clean	Water level / Colour	Sodium hypochlorite added	Total Chlorine concentration	Water used for dust suppression	Fence check	Completed by	
Date	Time	Quarterly (maintenance)	Weekly	Weekly	Daily	Daily	Daily	Monthly	at least 2 - 3 times per week	Daily	Weekly	Monthly	Quarterly	at least 2 - 3 times per week	Daily	Weekly	Weekly	When used for dust suppression	When used for dust suppression	Yes / No	Weekly	Daily - sign name	Notes
1	7				✓	✓	✓			✓		1.0			✓			300L	1.5			G.B	All good
2	7				✓	✓	✓			✓					✓			200	3			GB	All Good
3	11				✓	✓	✓			✓					✓							GB	
4	7				✓	✓	✓			✓					✓							GB	
5	7.10				✓	✓	✓			✓					✓							GB	
6	7				✓	✓	✓			✓					✓							GB	
7	7.30				✓	✓	✓			✓					✓							GB	
8	6:20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~~1.5~~			✓	✓	✓	150	1.5	Yes	✓	TM	~~No ct Tabs~~
9	6.00				✓	✓	✓		✓	✓		5.0			✓			50	1.5	Yes		TM	
10	6:30				✓	✓	✓		✓	✓					✓			50	2.0	Yes		TM	
11	6.00				✓	✓	✓	✓	✓	✓				✓	✓			50	1.0	Yes		TM	
12	6:30				✓	✓	✓	✓	✓	✓				✓	✓			50	3.0	Yes	✓	TM	
13	6:00				✓	✓	✓		✓	✓				✓	✓							TM	Broken pump error
14	6:00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1.5	✓	✓	✓	✓	✓			N	✓	TM	B-class pump out
15	7:00		✓		✓	✓	✓	✓	✓	✓					✓					N		NT	
16	7:00				✓	✓	✓		✓	✓				✓	✓					N		NT	All OK.
17	7:30		✓		✓	✓	✓			✓	✓				✓					N		NT	" "
18	7:00				✓	✓	✓			✓	✓				✓					N		JL	
19	7:00				✓	✓	✓			✓	✓				✓					N		JL	need chlorine
20	7:00				✓	✓	✓			✓	✓				✓					N		JL	
21																				N			
22	10:00				/	/	/			/					/					N		KS	Put tablets in
23	7:00				/	/	/			/					/					N		KS	
24	7:00				/	/	/			/					/					N		KS	
25	7:00				/	/	/			//					//					N		KS	All Good
26	7:15				/	/	/		/	//					//					N		KS	
27	7:00				/	/	/			/					/					NO		KS	
28	7:00				/	/	/			/					/					NO		KS	Pump not Working
29																				NO			
30	8:30		✓	✓	✓	✓	✓		✓	✓				✓	✓			150L		NO		CL	Pond w/ algae build up
31	9:00			✓	✓	✓	✓		✓	✓		0.00			✓								Heavy humic sand on floor tank.

Notes: * Open valve in sludge draw-off tank for 10-20 minutes, 2 - 3 times per week
** Primary tanks to be de-sludged at least annually - refer to maintenance schedule

Iluka Jacinth-Ambrosia – Hydrocarbon Stores Compliance Inspection

ILUKA

Cintellate No:

ILUKA RESOURCES LIMITED
MONTHLY INSPECTION CHECKLIST - JA LUBRICANT STORES Date:

CIRCLE ONE Exact Sea container ☐ Exact Outdoor area ☐ Iluka Sea Container ☐ Fuel Tower ☐ KPS ☐

ITEM	STANDARD AS1940	ITEM CONFORMS TO STANDARD			Exact 1 Lot.	Exact 2 Outdoor bund	Iluka	Fuel Tower Tank farm	KPS	NON CONFORMANCE IDENTIFIED
A	INTENDED USE	N/A	NO	YES						
1	<2500 litres of C1 Diesel fuel Biocide	N/A	0	1	N.A	NA	N/A	NA		12.
2	<5000 litres of C2 Engine, gearbox, hydraulic oils & grease	N/A	0	1	1	0	0	NA		12 Drum of 200L Hydraulic oils.
3	No chemicals	N/A	0	1	1	NA	N/A	NA	1	
B	SIGNAGE AS1940 pp32	N/A	NO	YES						
1	DANGER - No Smoking, No Naked Flames	N/A	0	1	1	0	1	1 0	0	Faded - fuel tower
2	Combustible liquid	N/A	0	1	1	0	1	0 1	0	
3	WARNING - Restricted Area, Authorised Personnel Only	N/A	0	1	1	0	1	0 0	0	
4	Emergency Contacts - Title & Phone numbers	N/A	0	1	0	0	1	0 0	0	
5	Iluka name & address	N/A	0	1	0	0	1	0 0	0	
6	Layout diagram	N/A	0	NA	0	0	N/A	0 0	0	? need layout Diagram
C	FIRE REQUIREMENTS AS1940 pp122-124	N/A	NO	YES						
1	Powder extinguishers x 2 only 1 Exact.	N/A	0	1	0	0	0	1 1	0	KPS - last checked out 13.
2	Foam extinguisher x 2 No foam. Exact.	N/A	0	1	0	0	0	0 0	0	need foam extinguisher?
D	SAFETY REQUIREMENTS AS1940 pp51	N/A	NO	YES						
1	Eye wash facilities within 10 mtrs	N/A	0	1	1	0	1	1 0	0	tested.
2	Handwashing facility within 10 mtrs	N/A	0	1	0	0	1	1 0	0	" "
3	A safety shower within 10 mtrs	N/A	0	1	0	0	1	1 0	0	" "
E	HOUSEKEEPING & SPILLAGE	N/A	NO	YES						
1	Hydrocarbon store clean and tidy inside and around	N/A	0	1	1	1	/	1 0	1	✱
2	No leaks	N/A	0	1	1	1	1	1 0	1	
3	No evidence of spills	N/A	0	1	1	1	1	1 0	1	
4	Drum and hoses within store area	N/A	0	1	1	1	0	1 1	1	4 Drums and 8 Bucket's out side container.
5	MSDS	N/A	0	1	.	NA.	?	0	0	MSDS is not in container
6	Spill kit	N/A	0	1	0	0	1	1 1	0	

Cintellate No:

ILUKA RESOURCES LIMITED
MONTHLY INSPECTION CHECKLIST - JA LUBRICANT STORES

Date:

CIRCLE ONE Exact Sea container ☐ Exact Outdoor area ☐ Iluka Sea Container ☐ Fuel Tower ☐ KPS ☐

ITEM	STANDARD AS1940	ITEM CONFORMS TO STANDARD			Exact 1	Exact 2	Iluka	Fuel Tower	KPS	NON CONFORMANCE IDENTIFIED
7	Clear access	N/A	0	1	1	1	0	1	1	Buckets, Blockingfire extinguisher

INSPECTION CONDUCTED BY:

Name:	Sign:	Date:

	Exact 1	Exact 2	Iluka	Towers	KPS
TOTAL SCORE:	0	0	0	0	0
MAXIMUM POSSIBLE SCORE:	20	20	20	20	20
PERCENT CONFORMANCE SCORE:	0.0%	0.0%	0.0%	0.0%	0.0%

INSTRUCTIONS

1) Circle the applicable score for each item on the Planned Inspection Checklist (i.e. N/A, 0 or 1).
2) Write Non Conformance identified in the space provided
3) Install name, date and signature in the space provided below each item
4) Hand inspection to Area Supervisor for corrective actions to be issued.
5) Hand completed inspection to safety department for processing.
6) Send copies of completed inspection to relevant department heads and place copies on notice boards.

Iluka Jacinth-Ambrosia - HAZCHEM Register (ChemAlert)

(Extract Only – full register available on request)

SITE	STOCK_NUMBER	PRODUCT_NAME
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA	1367	AMC BACKFILL B3
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA	1999	CAUSTIC SODA - LIQUID (46%-50%)
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA	1333	CAUSTIC SODA - LIQUID (5%-45%)
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA	1411	EUCLA HEAVY MINERAL CONCENTRATE
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA	1355	FORMALIN 37-40 %
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA	875	KEROSENE
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA	875	KEROSENE
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA	875	KEROSENE
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA	322	KEROSENE UNMARKED (PRODUCT OBSOLETE)
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA	176	LIQUID NITROGEN
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA	1536	LIQUID SUPERTROL (PRODUCT OBSOLETE)
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA	192	SODA ASH (DENSE)
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA	1538	XCD POLYMER (FLUIDSTAR) (PRODUCT OBSOLETE)
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA/ ADMIN/AMENITIES	1458	DOMESTOS
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA/ ADMIN/AMENITIES	1457	FINISH 5 IN 1 POWERBALL TABS (PRODUCT OBSOLETE)
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA/ ADMIN/AMENITIES	1355	FORMALIN 37-40 %
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA/ ADMIN/AMENITIES	649	FRESHMINT
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA/ ADMIN/AMENITIES	670	GLAZE MAINTAIN
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA/ ADMIN/AMENITIES	627	GLAZE NEUTRAL CLEANER
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA/ ADMIN/AMENITIES	1993	LETHABARB EUTHANASIA INJECTION
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA/ ADMIN/AMENITIES	1437	SUNLIGHT DISHWASHING LIQUID
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA/ FLOC PLANT	1535	CCD 01 / FLOPAM AN905SH
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA/ FLOC PLANT	1534	DRYFLOC SU 25 E
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA/ FLOC PLANT	1374	RHEOMAX 1050
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA/ MAINTENANCE WORKSHOP	143	5.56 AEROSOL
ILUKA/ SA OPERATIONS/ JACINTH AMBROSIA/ MAINTENANCE WORKSHOP	114	ACETYLENE