AUSTRALIAN STRATEGIC MATERIALS LTD

(A wholly owned subsidiary of Alkane Resources Ltd)

ABN 51 091 489 511

Dubbo Project
Annual Review
1 July 2016 – 30 June 2017

Dubbo Project site looking east from above Obley Road. Photo taken 19 October 2016.

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Definitions

Term	Definition
ASM	Australian Strategic Materials Ltd
AZL	Australian Zirconia Ltd
BOA	Biodiversity Offset Area
$CaCO_3$	Calcium carbonate
CPVP	Conservation Property Vegetation Plan
CCC	Community Consultative Committee
DP	Dubbo Project
DPE	Department of Planning & Environment
DRC	Dubbo Regional Council
DRG	Department of Resources and Geoscience
DSC	Dam Safety Committee
EEC	Endangered ecological community
EC	Electrical Conductivity
EPA	Environment Protection Authority
EP&A	*Environment Planning and Assessment Act 1979*
EPBC	*Environment Protection & Biodiversity Conservation Act 1999*
ERML	Environmental Radiation Monitoring Location
EPL	Environment Protection Licence
Ha	Hectares
HVAS	High volume air sampler
LDP	Licensed discharge point
LFA	Landscape function analysis
LLS	Local Land Services
LOR	Limit of Reporting
LRSF	Liquid Residue Storage Facility
Mining Act	*Mining Act 1992*
MOP	Mining Operations Plan
ML	Mining Lease
NGERS	National Greenhouse and Energy Reporting Scheme
NMP	Noise Management Plan
NOW	NSW Office of Water
OEH	Office of Environment and Heritage
PM10	Particulate matter 10 microns and smaller
PTWL	Pink-tailed Worm-lizard (*Aprasia parapulchella*)
PVP	Property Vegetation Plan
RAP	Registered Aboriginal Party
REE	Rare Earth Elements
RMS	Roads and Maritime Services
ROM	Run of Mine
SEEC	Strategic Environmental and Engineering Consulting
TARP	Trigger action response plan
TEOM	Tapered Element Oscillating Microbalance
TIM	Total Insoluble Matter
SEC	Salt Encapsulation Cell
SRSF	Solid Residue Storage Facility
TPC	Toongi Pastoral Company
TSP	Total suspended particulates
WAL	Water access licence
WHS	Workplace Health & Safety
WRE	Waste Rock Emplacement

Title Block

Table 1: Annual Review title block

Name of operation	Dubbo Project
Name of operator	Australian Strategic Materials Ltd
Development consent / project approval #	SSD-5251
Name of holder of development consent / project approval	Australian Strategic Materials Ltd
Mining lease #	ML 1724
Name of holder of mining lease	Australian Strategic Materials Ltd
Water licence #	WALs; 19994, 9191, 3396, 13599, 36409, 3412, 302259, 36790
Name of holder of water licence	Australian Strategic Materials Ltd
MOP/RMP start date	1 Dec 2015
MOP/RMP end date	30 Nov 2017
Annual Review start date	1 July 2016
Annual Review end date	30 June 2017
I, Michael Sutherland, certify that this audit report is a true and accurate record of the compliance status of the Dubbo Project for the period 1 July 2016 to 30 June 2017 and that I am authorised to make this statement on behalf of Australian Strategic Materials Ltd. Note. a) The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000. b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or $22,000, or both).	
Name of authorised reporting officer	Michael Sutherland
Title of authorised reporting officer	General Manager NSW
Signature of authorised reporting officer	
Date 13 September 2017	

1 Statement of Compliance

Table 2 provides a statement of compliance status for Australian Strategic Materials Ltd (ASM) with its project approval (SSD) and mining lease (ML), as at the end of the reporting period.

Table 2: Statement of Compliance

Were all conditions of the following approvals complied with?	
SSD-5251	YES
ML 1724	YES

Table 3 provides a summary of approval conditions not complied with as at the end of the reporting period.

Table 3: Non-compliances

Relevant approval	Condition #	Condition description (summary)	Compliance status	Comment	Relevent Section
SSD-5152	NA	NA	NA	NA	NA

Compliance status key for Table 3		
Risk level	**Colour Code**	**Description**
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-compliant	Non-compliance with: • potential for serious environmental consequences, but is unlikely to occur; or • potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: • potential for moderate environmental consequences, but is unlikely to occur; or • potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

2 Introduction

2.1 Dubbo Project

This Annual Review reports on operational and environmental management activities undertaken by Australian Strategic Materials Ltd (ASM) at the Dubbo Project (DP) during the financial year (FY) 2016-2017, and provides details on activities proposed for FY 2017/2018. The report has been produced in accordance with the *Post-approval requirements for State significant mining developments. Annual Review Guideline* (DP&E, October 2015) to meet the annual reporting requirements conditioned in the DP Mining Lease (ML 1724) and Project Approval (SSD-5251). See **Figure 1**.

ASM is a wholly owned subsidiary of Alkane Resources Ltd. The DP, approved as SSD-5251 by the NSW Planning Assessment Commission (PAC) on 28 May 2015, comprises a small scale open cut mine supplying ore containing rare metals and rare earth elements to a processing plant near the locality of Toongi, approximately 25km south of Dubbo (the DP Site) (see **Figure 2**). The DP is yet to be constructed.

Annual extraction of ore from the open cut is planned to be approximately one million tonnes per year which generates approximately 35 000t of products. Waste residues produced by the processing operations will be managed in residue storage facilities, designed to contain and encapsulate these residues.

The DP also includes the construction of a water pipeline between the processing plant and the Macquarie River, a pipeline to carry natural gas between Dubbo and the DP Site, and the upgrades of the following linear infrastructure;

- Toongi Road;
- Obley Road; and
- the Toongi-Dubbo section of the currently disused Dubbo-Molong Rail Line.

Collectively, these are referred to as the DP linear infrastructure and are identified on **Figure 1**.

2.2 Mine Contacts

The primary contacts for the DP during the review period are detailed in **Table 4.** This table will be updated when construction gets underway in the next reporting period.

Table 4. Dubbo Zirconia Project Key Contacts

Key Contact	Position	Contact Details
Nic Earner	Managing Director	PO Box4384, Victoria Park, WA Phone (08) 9227 5677
Michael Sutherland	General Manager NSW	PO Box 910 Dubbo NSW 2830 Phone: (02) 6882 2866
Community Information Line	General Manager NSW	(02) 6882 2866

Figure 1: Dubbo Project – Local Setting.

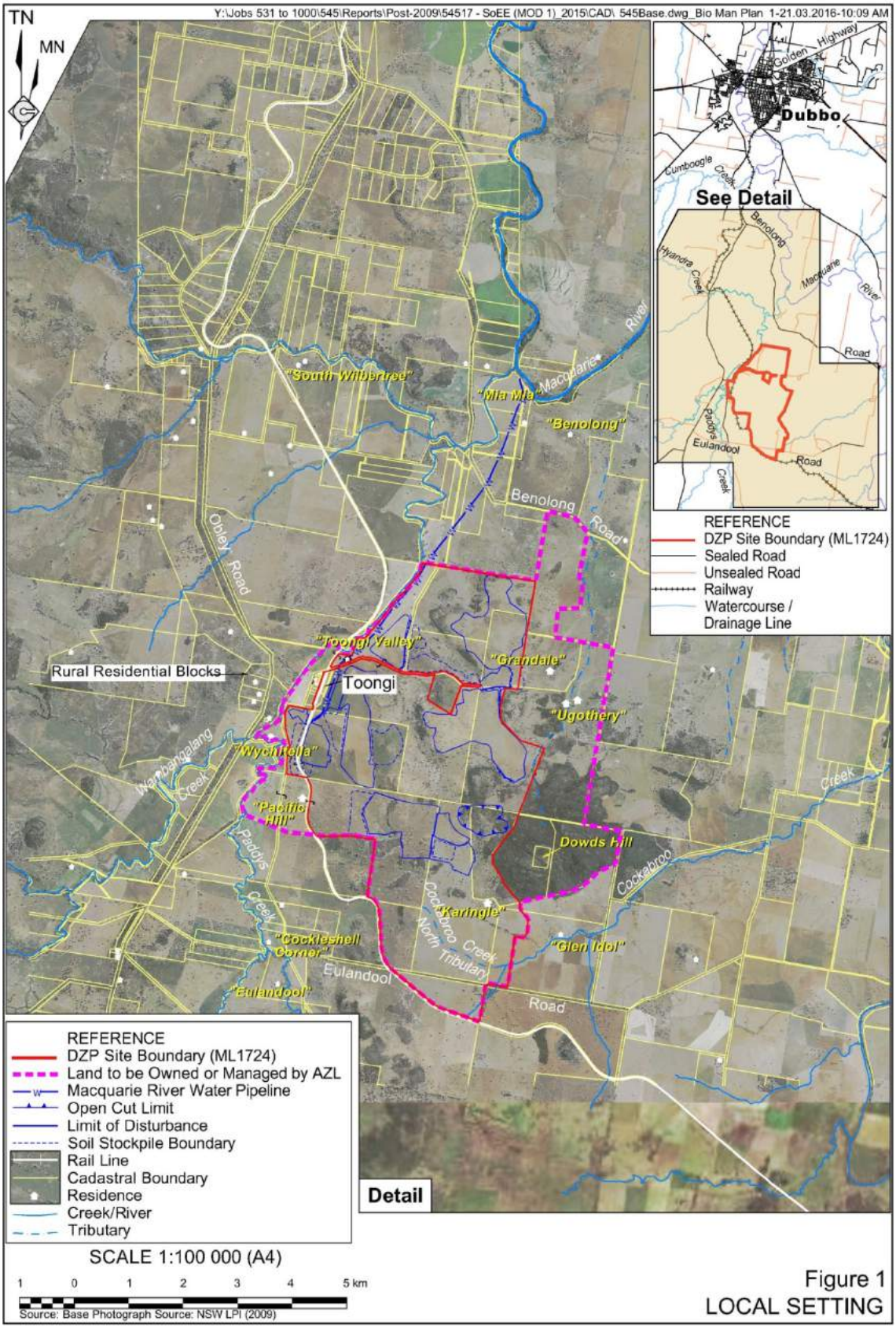


Figure 2: Dubbo Project – site layout

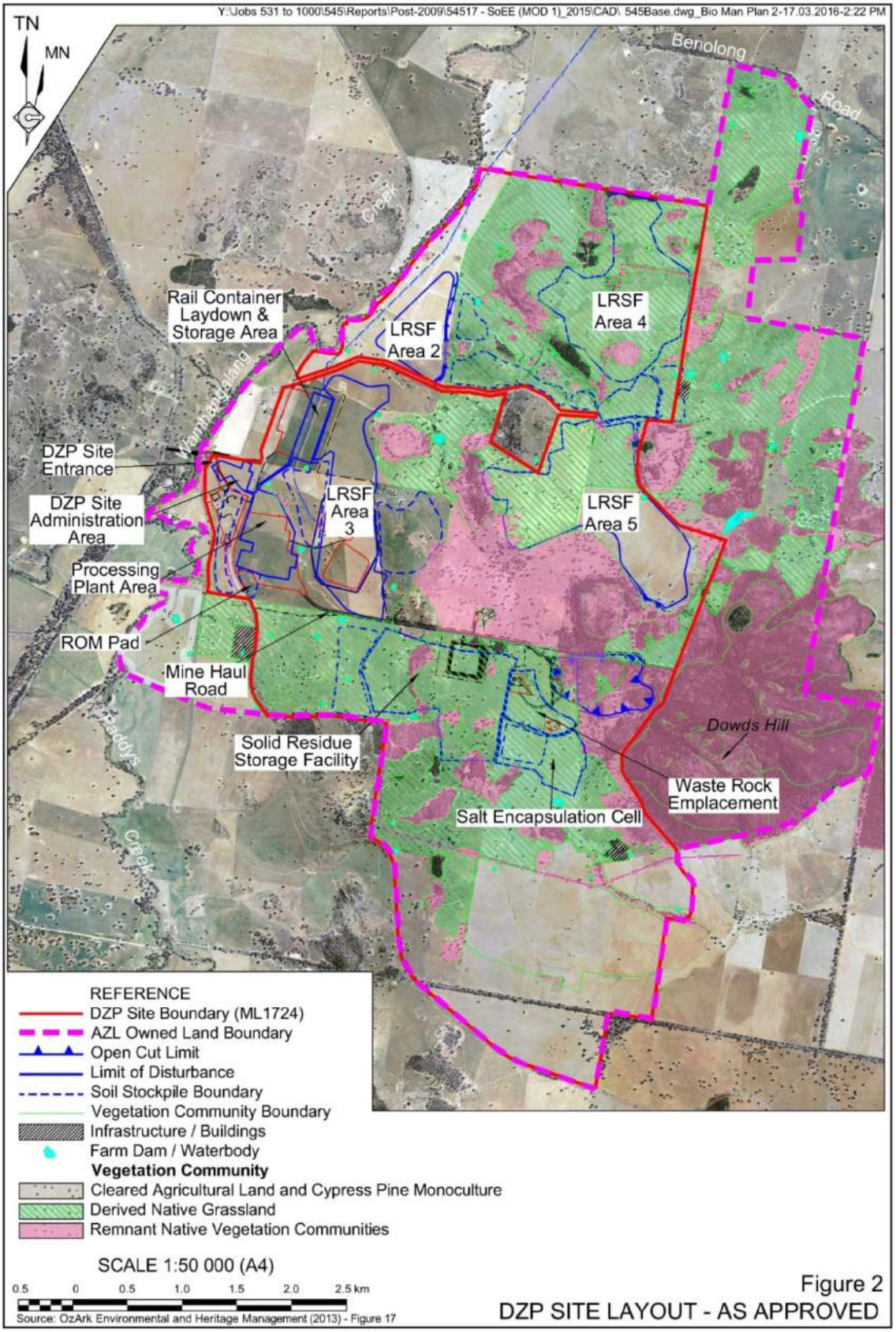
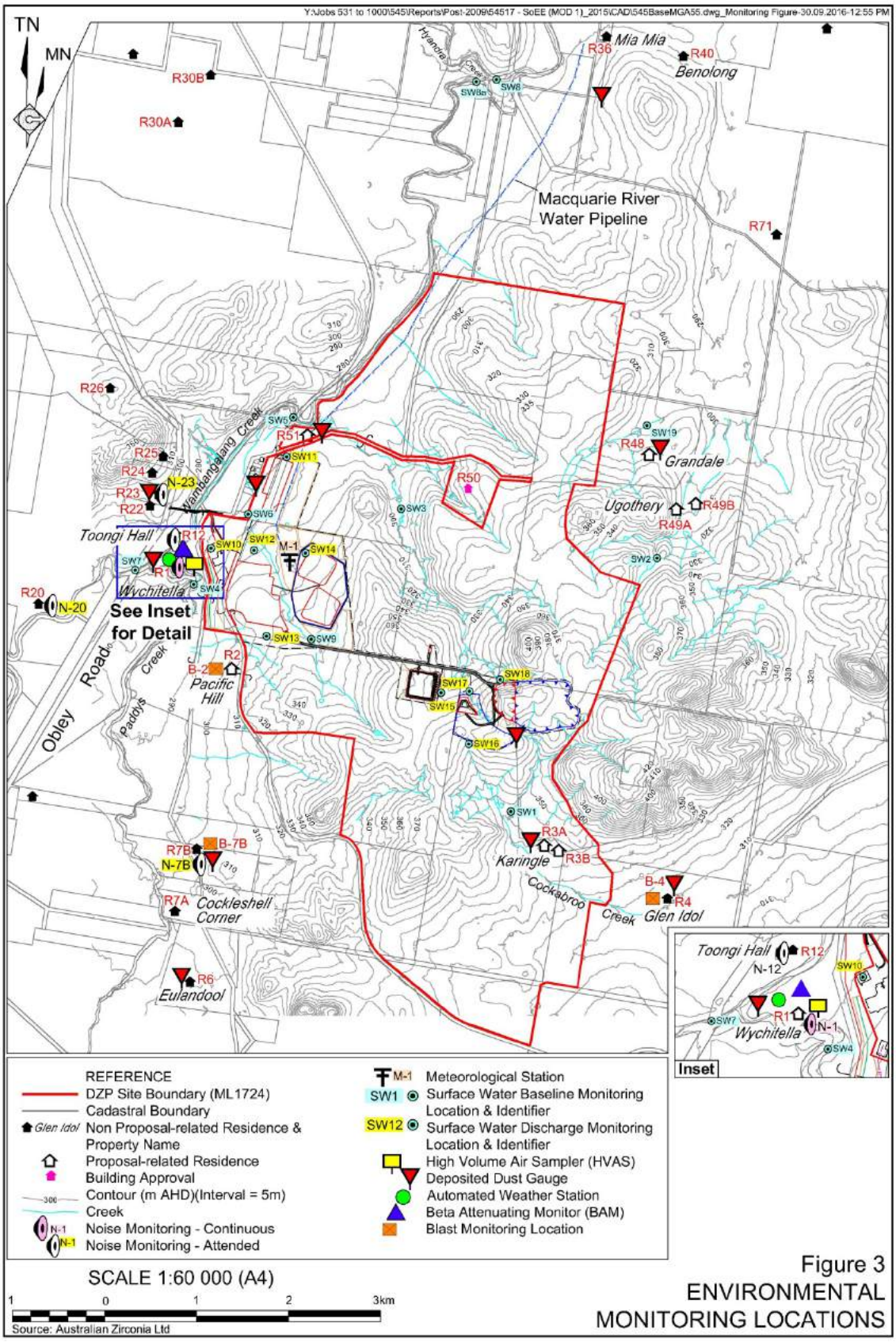


Figure 3: Dubbo Project – environmental monitoring locations.



Approvals - DP operates under the environmental consents, leases and licenses specified in Table 5.

Table 5. Consents, leases and licenses

Title & date granted	Legislation	Regulatory Authority	Approval Duration/ Expiry
State Significant Development approval 5251 (28 May 2015)	Environmental Planning & Assessment (EP&A) Act 1979	NSW Planning and Environment (DPE)	31 December 2037
EPBC 2012/6625 24 Aug 2015	EPBC Act 1999	Commonwealth Government-Dept of Environment and Energy	31 December 2045
Mining Lease 1724 21 Dec 2015	Mining Act (1992)	NSW Department Resources & Geoscience (DRG)	18 December 2035
Environment Protection License (EPL) 20702 14 Mar 2016	Protection of the Environment Operations (POEO) Act 1997	NSW Environment Protection Authority (EPA)	Ongoing until surrendered (14 March Anniversary)
Access & Compensation Deed (access to rail corridor) 20 Oct 2015	Section 62 Mining Act (1992)	Transport for NSW	18 December 2035
Grazing Licence (Toongi rail corridor) 1 Jul 2013	Annual Licence	Transport for NSW	30 Jun 2018
Karingle Quarry (Lot 19 DP753252) 7 Jul 2016	Environmental Planning & Assessment (EP&A) Act 1979 (Sec 81 (1) (a)	Dubbo Regional Council	7 Jul 2021
Karingle Quarry General Terms of Approval 14 Jun 2016	Environmental Planning & Assessment (EP&A) Act 1979 (Sec 91 (1) (a)	NSW Environment Protection Authority (EPA)	7 Jul 2021
Planning Agreement 15 Oct 2014	Environmental Planning & Assessment (EP&A) Act 1979	Dubbo Regional Council	31 December 2037
Water Access Licences WALs; 19994, 9191, 3396, 13599, 36409, 3412, 302259, 36790	Water Management Act 2000	NSW Office of Water (NOW)	N/A
Conservation Property Vegetation Plan 31 May 2017	Native Vegetation Act 2003	Central West Local Land Services	In perpetuity

3 Operations Summary

3.1 Construction

Construction of the Dubbo Project has not commenced as of 30 June 2017. There have been no on ground works associated with the DP despite all approvals being in place. The Project's financing is in the process of being secured.

3.2 Operations

All of the land enclosing the DP was aquired by Australian Strategic Materials Ltd by June 2016 and a professional Farm Manager was appointed in May 2016.

The Farm Manager has been charged with the responsibility of operating a commercially viable sheep and cattle operation (Toongi Pastoral Company Pty Ltd) on 2,500Ha of land enclosing the Mining Lease and project footprint.

Fencing and managing the 1,021Ha Biodiversity Offset Aeas will also fall under the responsibility of the Farm Manager.

Environmental monitoring points are shown in **Figure 3**.

Baseline water quality, air quality and meteorological data is collected by trained Alkane staff.

Ecological monitoring continues to be undetaken by qualified professionals.

A Community Consultative Committee with an independent Chirperson was established in late 2015 and has met quarterly.

3.3 Next reporting period

During the next reporting period (1 July 2017 to 30 June 2018), assuming that the project is financed and approved by the Board, construction is expected to commence, including:

- Obley and Toongi Road upgrade (including barrier at TWPZ);
- Water supply pumps and pipelines;
- Karingle basalt quarry operations (on site supply of construction materials)
- Erosion and sediment control structures;
- Relocation of 11KV powerlines in the vicinity of the processing plant;
- Construction earthworks; and
- Processing plant construction.

4 Actions required from previous Annual Review

This is the second Annual Environmental Management Review for the Dubbo Project.

Table 6. Actions from review previous Annual Review

Actions Required from previous AEMR Review	Requested by	Action taken by Operator	Section where discussed
List of actions contained in letter from DPE dated 8 Nov 2016	DPE	Michael Sutherland	Appendix E

5 Environmental performance

5.1 Air Quality

The DP Air Quality Management Plan (AQMP) was prepared to describe dust control measures at DP and meet the requirements of Schedule 3, Condition 18 of SSD-5251.

Management Plans can be found on the Dubbo Project web page at

http://www.alkane.com.au/current_projects/dp-environment/management-plans

Air Quality criteria for the project are outlined in **Table 7.**

Table 7. Long term criteria for deposited dust

Pollutant	***Averaging period***	***Maximum increase in deposited dust level***	***Maximum total deposited dust level***
c Deposited dust	Annual	b 2 g/m^2/month	a 4 g/m^2/month
Notes to Table 7: ☐*a Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to other sources);* ☐*b Incremental impact (i.e. incremental increase in concentrations due to the development on its own);* ☐*c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003:*			

Before construcion commences a High Volume Sampler (HVS) for mesuring Total Suspended Particulates (TSP) and PM_{10} (particulate matter <10µm) will be installed at a location (WY1) between Wychitella homestead and the Toongi Hall.

Deposited dust is currently measured at 10 locations within and neighbouring the project site. Baseline deposited dust data collection recommenced on 29 November 2012.

Deposited dust gauges are changed over monthly (since January 2017) and three sample sites have monthly samples amalgamated to create enough sample to do additional testwork for radionuclides.

The Cockleshell Corner dust gauge was relocated to Eulandool on 3 August 2015 to enable baseline data to be presented to the property owner.

Three and half years of deposited dust monitoring has revealed the the project site yields low levels of nuisance dust and is typical of mixed agricultural land with a 550mm annual rainfall.

To date there is no recent data on suspended particulates.

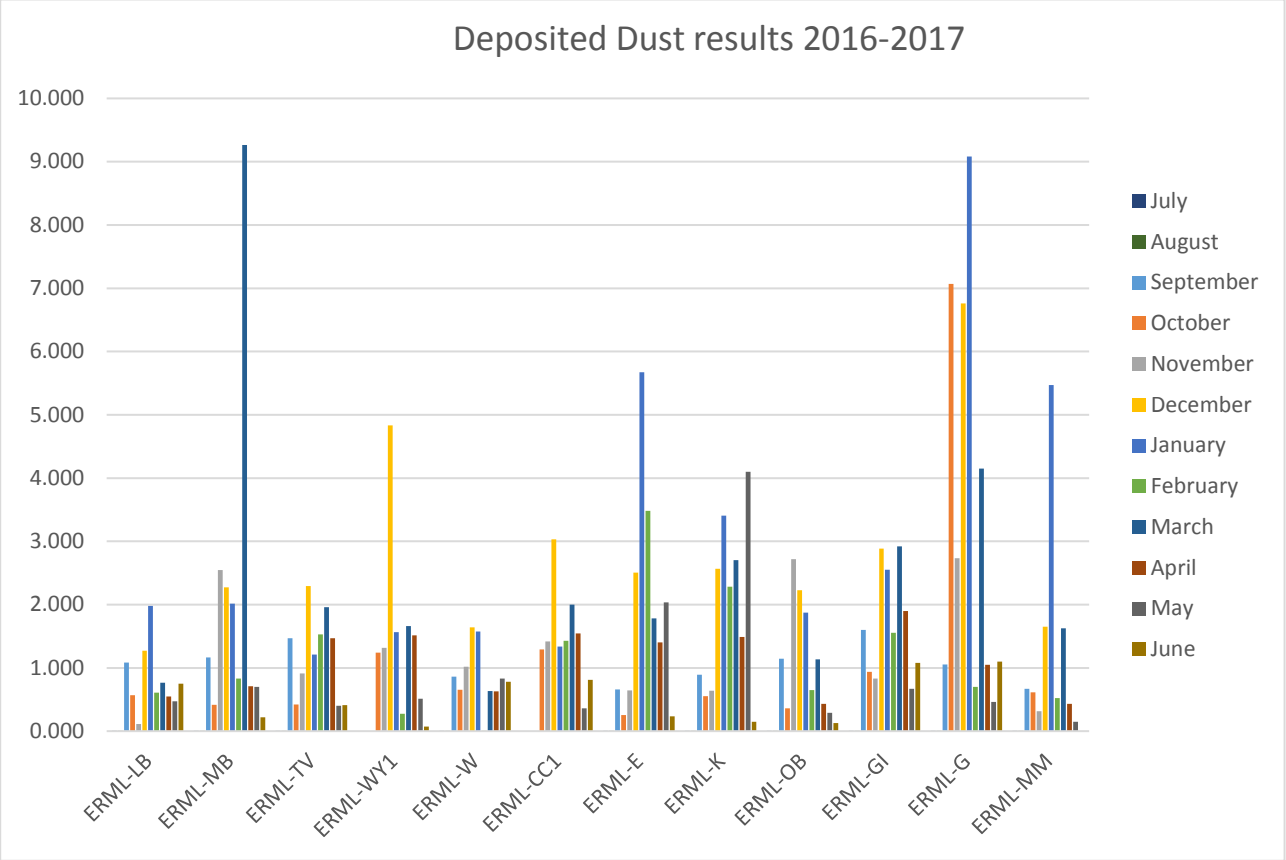
Table 8.Deposited Dust Results

Site ID	Site Name	Annual Dust Deposition Rates (g/m^2.month)		
		2014-2015	2015-2016	2016-2017
		30/5/14 - 23/6/15	23/6/15 - 2/6/16	2/6/2016- 2/6/2017
ERML-LB	Lifestyle Blocks	0.264	0.761	0.572
ERML-MB	Malcolm Bye's	0.346	1.820	1.613
ERML-TV	Toongi Valley	0.276	1.118	0.912
ERML-WY1	Wychitella HS			1.641
ERML-W	Wychitella	0.553	0.800	0.614
ERML-CC1	CC cottage			1.564
ERML-CC	Cockeshell Corner	2.349		
ERML-EU	Eulandool		2.030	1.493
ERML-K	Karingle	0.327	0.658	1.514
ERML-OB	Ore Body	0.314	0.574	0.843
ERML-GI	Glen Idol	0.786	1.052	1.252
ERML-G	Grandale**	0.726	4.669	2.667
ERML-MM	Mia Mia	1.103	3.524	0.911

*Approval Criteria from SSD-5251 Schedule 3, Condition 18, based on 2013 Project EIS Assessment Criteria

** Grandale dust gauge, despite having a bird deterrent attachment has been contaminated on more than one monitoring period by defecating birds.

Figure 4: Deposited dust results for 2016-2017



5.1.1 Management Measures

No dust management measures were employed during this reporting period as project construction has not commenced. These are baseline monitoring results influenced by seasonal and routine agricultural practices.

It should be noted that the Toongi rainfall winter-spring 2016 was one of the highest since records have been kept.

Seasonal conditions have deteriorated Apr-June being one of the driest Autumn-Winter periods on record.

Toongi Pastoral Company is relatively conservatively stocked and has maintained good pasture cover in all but cropping paddocks.

5.1.2 Proposed Improvements

Deposited dust monitoring data is now being gathered monthly as construction approaches, to allow more accurate month by month variations in dust levels to be determined.

5.2 Biodiversity

Biodiversity at DP is managed under the Biodiversity Management Plan (BMP), completed in accordance with Schedule 3, Condition 31-35 of SSD-5251.

A component of the BMP is the Biodiversity Offset Strategy, which delineates the 1,021Ha of biodiversity offset areas and management actions selected to protect and enhance remnant vegetation communities. The Biodiversity Offset Area (BOA) is protected in perpetuity with the registration on land title of a Conservation Property Vegetation Plan (CPVP) under the *Native Vegetation Act 2003*.

The CPVP was signed by ASM Directors on 22 May 2017 and Central West Local Land Services on 31 May 2017. Approximateley 30km of new fencing will be erected by 30 May 2019 to secure the BOAs.

A Conservation Bond will be lodged with DPE prior to commencement of any development. The Department will be advised in writing at least three months pror to construction commencing.

5.2.1 Management Measures

Biodiversity manageemnt actions for the DP are focussed towards protection and enhancement of habitat for the State and Commonwealth listed Pink-tailed Worm-lizard (PTWL) (*Aprasia parapulchella*).

ASM has prepared a PTWL Management Plan (Version 2.3) and a PTWL Biodiversity Offset Management Plan both of which are appendices in the Biodiversity Management Plan (V2.0) which was approved by DPE on 8 February 2017. (see Alkane website).

DP biodiversity monitoring is completed annually and is based on Landscape Function Analyses (LFA) and ecosystem diversity / habitat value measurements adapted from the Biometric methodology.

Four vegetation community benchmarks and one control site were established around and neighbouring the project site in May 2016.

See **Appendix A** for letter report on December 2016 vegetation plot monitoring results (OzArk May 2017). In summary, Jun-Dec 2016 saw above average rainfall across the project site which manifested in very good groundcover in the benchmark vegetation plots.

The Pink-tailed Worm-lizard Biodiversity Offset Managment Plan has been prepared with specific actions targeting habitat enhancement for this listed species.

PTWL surveys were conducted on 28 October 2016 and 29 April 2017.**See appendix A** for survey results. No PTWLs were found during the two survey period but several other reptile species were.

The survey method followed the accepted *Clearing Procedure: Pink-tailed Worm-lizard* issued by OzArk in November 2013. Not all tile sites were assessed due to temperature and time constraints however the sites assessed were completed during climatic conditions most likely to yield a result.

ASM settled on the last of the properties in June 2016 which created the opportunity for a change in focus of land management to biodiversity enhancement. This is a significant change in focus after 150 years of management for agricultural production.

Remnant vegetation monitoring sites are recovering at varying rates, depending on grazing and cultivation history.

5.2.2 Proposed Improvements

During the next two reporting periods,

- ASM will commence fencing all of the biodiversity offset areas.
- Livestock will be excluded from BOAs to allow for natural regeneration.
- White Cypress Pine will be thinned to improve grass cover and reduce rainfall runoff.
- Introduced vetebrate pest (pigs, foxes, cats and rabbits) control will continue.
- Signage in strategic areas will warn of restricted access to BOAs.

5.3 Heritage

A Heritage Management Plan (HMP), which outlines measures to manage Aboriginal and Non-Aboriginal heritage sites at DP was approved by DPE on 8 February 2017.

The Farm Manager has use of a database to ensure that heritage sites outside of the project footprint and BOAs are not further disturbed by routine agricultural activities.

With all existing or relocated sites adequately maintained, no active cultural heritage management occurred during the reporting period.

5.3.1 Management Measures

As recorded heritage sites are located away from site operational areas, and no new sites or items were identified during the reporting year, management of the existing sites mainly consisted of the Farm Manager and Stationhand familiarising themselves with the sites across the land controlled by Toongi Pastoral Company.

5.3.2 Proposed Improvements

RAPs will be invited to review heritage sites across the project at an agreed frequency.

5.4 Meteorological Monitoring

The met station at Wychitella has been operating since 2001. It collects data to a solar powered logger and has to be visited to download data for offsite porcessing.

Wind speed and direction, temperature and rainfall are collected. Rainfall data for the reporting period is shown graphically in **Appendix B**.

5.4.1 Proposed Improvements

In March 2017 ASM converted the weather station at Wychitella to a cloud based data storage system with real time access to data. There is a break in weather data for this reporting period though rainfall data is continuous from the Met Station or Grandale Homestead rain gauge.

During the next reporting period the weather station which was established in Wychitella CT paddock may be relocated to the saddle paddock and an additional main wearther station will be established in the house paddock. The two weather stations will be more than fifty metres vertically separated and will allow real time monitoring of temperature inversion conditions which can impact on noise and air quality.

6 Water Management

The DZP Water Management Plan (Version 2.1 dated 16 Oct 2016) was approved by DPE on 12 October 2016.

During the reporting period *Water Performance Measures* were included in the DP project approval., Condition 29 of Schedule 3 of SSD- requires ASM to comply with these measures. **Table 9** presents these *Water Performance Measures* and where each measure is addressed in this Water Management section.

As no constrcution has commenced on site the measures below have not yet been installed.

The latter half of 2016 which was unseasonally wet provided several opportunity to sample surface water sites that are dry 95% of the time. The samples collected have provided useful baseline water quality data.

Table 9. Water management performance measures

Feature	***Performance Measure***
Water Management – General	Minimise the use of clean water on site. Minimise the need for make-up water from external supplies.
Construction and operation of infrastructure	Design, install and maintain all infrastructure within 40 m of watercourses to: • minimise the impact on watercourse water quality, hydrology and function; • minimise the impact on the habitat of aquatic species, populations or communities, consistent with the *Guidelines for fish habitat conservation and management – Chapter 4* (DPI 2013), or its latest version*;* • ensure pipelines across perennial watercourses are installed by directional drilling (under-boring) or attached to rail or road bridge crossings; and • be in accordance with NOW's *Guidelines for Controlled Activities on Waterfront Land* (2012), or the latest version(s).
Macquarie River Pumping Station	Design, construct and operate the water intake structure to prevent to the greatest extent practicable the entrapment and/or extraction of aquatic fauna species including juvenile fish and larvae.
Mine Water Management System - General	Design, install and/or maintain mine water storage infrastructure to prevent the discharge of mine water off-site (this does not apply to sediment control structures that can be designed to discharge in accordance with an EPL). On-site storages are suitably designed, installed and/or maintained to minimise permeability. Maintain adequate freeboard at all times to minimise the risk of discharge to surface waters.
Waste Residue Storage Facilities and Salt Encapsulation Cells	Nil discharge from site. Design, construct and maintain: • in accordance with the recommendations of the NSW Dam Safety Committee; • to be stable over the long term and under all expected loading conditions;

Table 9. Water management performance measures

Feature	*Performance Measure*
	• in accordance with the standards set out in the *Environmental Guidelines – Management of Tailings Storage Facilities* (VIC DPI, 2006); and • to be lined with HDPE liners or equivalent that complies with a minimum permeability standard of < 1 x 10-9 m/s in accordance with the *NSW Environmental Guidelines for Solid Waste Landfills* (EPA, 1996), unless otherwise agreed with the EPA; and • to ensure the Solid Residue Storage Facility and Salt Encapsulation Cells are double-lined and include an adequate leak detection system. Ensure that at all times a freeboard of at least 600 mm (or 1000 mm for liquid residue storage facility) or a freeboard capable of accommodating a 1 in 100 year ARI, 72 hour rainfall event (or 1 in 10,000 year for the liquid residue storage facility) without overtopping, whichever is greater.
Waste Rock Emplacement	Design, install and maintain the emplacement to encapsulate and prevent: • migration of potentially acid forming material, and saline and sodic material; and/or • manage long term saline groundwater seepage.
Clean water diversion & storage infrastructure	*Design, install and maintain the clean water diversion system to capture and convey the 100 year ARI flood around the perimeter of the site. Maximise as far as reasonable and feasible the diversion of clean water around disturbed areas on site.
Flood mitigation measures	Design, install and maintain flood mitigation measures ensuring that the Processing Plant, Administration areas, Waste Residue Storage Facilities, Salt Encapsulation Cells and Waste Rock Emplacement are appropriately protected from flooding up to the 1 in 100 ARI. Residual impacts downstream must be managed in an appropriate manner.
Sediment control structures	Design, install and maintain erosion and sediment controls generally in accordance with *Managing Urban Stormwater: Soils and Construction – Volume 1* and *Volume 2E Mines and Quarries.*
Chemical and hydrocarbon storage	Chemical and hydrocarbon products to be stored in covered, impervious bunded areas in accordance with the relevant Australian Standards.
Aquatic and riparian ecosystem	Maintain or improve baseline channel stability. Develop site-specific in-stream water quality objectives in accordance with ANZECC 2000 and *Using the ANZECC Guidelines and Water Quality Objectives in NSW* procedures (DECC 2006), or its latest version

Note *: a diversion system around the project site is not possible nor feasible but clean and dirty water systems will be kept separate through engineering design.

6.1 Water Supply

The principal source of water for DP is the Macquarie River seven kilometres north of the processing plant. A pump station within an easement on Mia Mia will supply water via a buried poly pipeline to the plant.

A combination of High and General security Macquarie River water licences will provide the DP with processing water. This river water can be supplemented with temporary water (through seasonal purchase) and also with bore water from a licenced bore established on "Sweet Water" 600m northeast of the pump station.

The production bore was established on Sweet Water in october 2016 and was pump tested for seven days in February 2017. An application for a Works Approval has been made with NSW Office of Water and the allocation will be determined subject to minimising the impact on a potable well water supply on "Retford Park".

Maximum Harvestable Rights Dams Capacity (MHRDC) is the volume of water landholders are entitled to capture and use without need for licencing. The maximum capacity of rainfall/runoff captured on ASM-owned land is 223ML/yr.

Sediment or pollution control structures are exempt from the MHRDC consideration, unless the water captured is to be re-used on the site/property for non-environmental purposes.

An onsite water treatment plant will be used to produce potable water, eliminating the requirement to import potable water.

Table 10. Water Supply

Water Licence	Water sharing plan, source and management zone (as applicable)	Entitlement (ML)	Active pumping
WALs:19994, 9191, 3396, 36409, 3412	High Security Macquarie/Cudgegong	856	0
WAL30259	General Security Macquarie/Cudgegong	750	0
N/A	NSW Murray Darling Basin Fractured Rock *Aquifer*	Stock & domestic	Stock & domestic
N/A	Onsite dams, under harvestable rights	223	Stock & domestic
WAL 36790	Upper Macquarie Alluvial Groundwater Source	0	N/A

6.2 Water Balance

The site water balance was being reviewed during the reporting period in line with a proposed modification of the project.

The water balance indicates that DP will be dependent on a combination of river and bore water.

The project is designed for zero dicharge of 'dirty water' which will be kept separate from existing 'clean' water discharges from the ephemeral drainage lines that drain the Toongi property.

6.3 Clean Water Management (Surface)

For reporting purposes, clean water management is divided into:

- onsite management;
- Wambangalang and Cockabroo Creeks; and
- offsite discharge.

6.3.1 Site Water

Clean water consists of through-flow from drainage of the undistrubed Dowd's Hill and water from onsite non-mine disturbed catchments. This water is diverted away from contamination sources (mine disturbance and infrastructure) and directed offsite. Management includes the construction of drains and bunds to collect and divert surface water flow past, or away from, mining disturbed catchments.

6.3.2 Surface Water Monitoring results

Baesline surface water monitoring occurred on four occasions during the reporting period. Sample results are included from July 2017 because by July 2017 the landscape was considerably drier and the Wambanagalang and Paddys Creeks were at low flows when salt concentrations are expected to be higher than during high flows.

Results from the previous period are included for comparison with surface water sampling events on 4 & 9 Aug 2016, 5 &6 Sep 2016, 4 Oct 2016, 23 Nov 2016 and 14 Jul 2017.

Monitoring Results are contained in **Appendix C**.

It is expected that all of the baseline data collected to date will enable water quality trigger values for the project to be established in consultation with the EPA.

6.3.3 Discharge

No licenced discharges occurred during the reporting period.

6.4 Mine Water Management

This section does not apply as no construction has commenced.

6.5 Erosion and Sediment Control

This section does not apply as no construction has commenced.

6.6 Groundwater

Sampling and pump testing of the stock and domestic bores around and neighbouring the project site occurred in June 2016. These bores have been establish for many years to supply stock and domestic water to several properties.

All DP groundwater bores (mostly in the fractured rock aquifers of the Lachlan Fold Belt) provide less than 2L/sec of stock quality drinking water.

Water quality testing of the seven stock and domestic bores available to Toongi Pastoral Company occurred in November 2017. Analyses were provided by DPI Enviornmental Laboratory.

In summary the groundwater quality was 'within Australian Drinking Water Guidelines" (Domestic farm use) but ranged from satisfactor for all stock uses to 'may cause digestive upset for stock" .

Groundwater pH ranged from 6.9-8.3, Electrical conductivity ranged from 260-5,300 microsiemens/cm and hardness from 64 -1,600mg/L $CaCO_3$.

Table 11. Stock and dometic bore depth and yield

Sample Reference	Bore Name	Location	Total Depth	L/sec	LPM	SWL
GW-001	Ugothery	Shed	67.24	0.37	21.9	11.05
GW-002	Grandale	West Bore	28.31	0.30	18.1	13.24
GW-003	Toongi Valley 2	Shearing Shed	36.96	0.91	54.6	8.95
GW-004	Wychitella	House	47.33	1.53	91.8	5.4
GW-005	Pacific Hill 1	Shed	48.55	1.40	84.1	18.52
GW-006	Karingle 2	Lane West of House	38.98	1.41	84.6	13.3
GW-007	Toongi Valley 3	Spring	12.86	1.64	98.3	2.61
GW-008	Karingle 1	House	39.66	1.32	79	16.29
GW-009	Toongi Village	Well	15.4	1.43	85.6	7.32

One bore on a neighbouring property was sampled during this round of monitoring to provide baseline data for the owner.

Seven geotech bores/piezometres were dipped for water levels on 4 August 2016.

Table 12. Geotech bores in the DP footprint August 2016

Bore	Depth	Wet	Depth to SWL (m) Oct 16	Depth to SWL (m) Sep 17	Reference Point (m above ground level)
C	13.06	No	Dry	Dry	N/A
S	15.72	Yes	14.4	10.73	0.75
W	15.27	Wet	15.24	15.24	0.7
E	14.95	Wet	14.51	Dry	0.9
Q	15.66	Wet	12.33	11.61	0.85
I	16.3	No	Dry	Dry	N/A
Y	11.6	Wet	9.32	8.93	0.9

These piezometers will be dipped again on 17 October 2016 to establish is the unususally wet winter/spring has caused the local water table to rise. Piezometers were dipped on 7 September 2017 after a very dry autumn-winter.

Table 13. Geotech bores in the DP footprint October 2016

Bore	Depth	Wet	Depth to SWL	Reference Point (above ground level)
C	13.06	No	Dry	N/A
S	15.72	Yes	9.96	0.75
W	15.27	Wet	15.24	0.7
E	14.95	No	Dry	0.9
Q	15.66	Wet	10.56	0.85
I	16.30	No	Dry	N/A
Y	11.06	Wet	7.29	0.9

Bore S saw a 4.44m rise in the water table during the very wet winter of 2016.

6.7 Proposed Water Management Improvements

No improvements are proposed to groundwater management at DP in the next reporting period.

7 Rehabilitation

The Dubbo Project has not yet commenced construction.

7.1 Rehabilitation during reporting period

No rehabilitated activities were completed during the reporting period.

7.2 Post Rehabilitation Landuse

These post-rehabilitation land use objectives and targets are contained in the the 2015-2017 MOP.

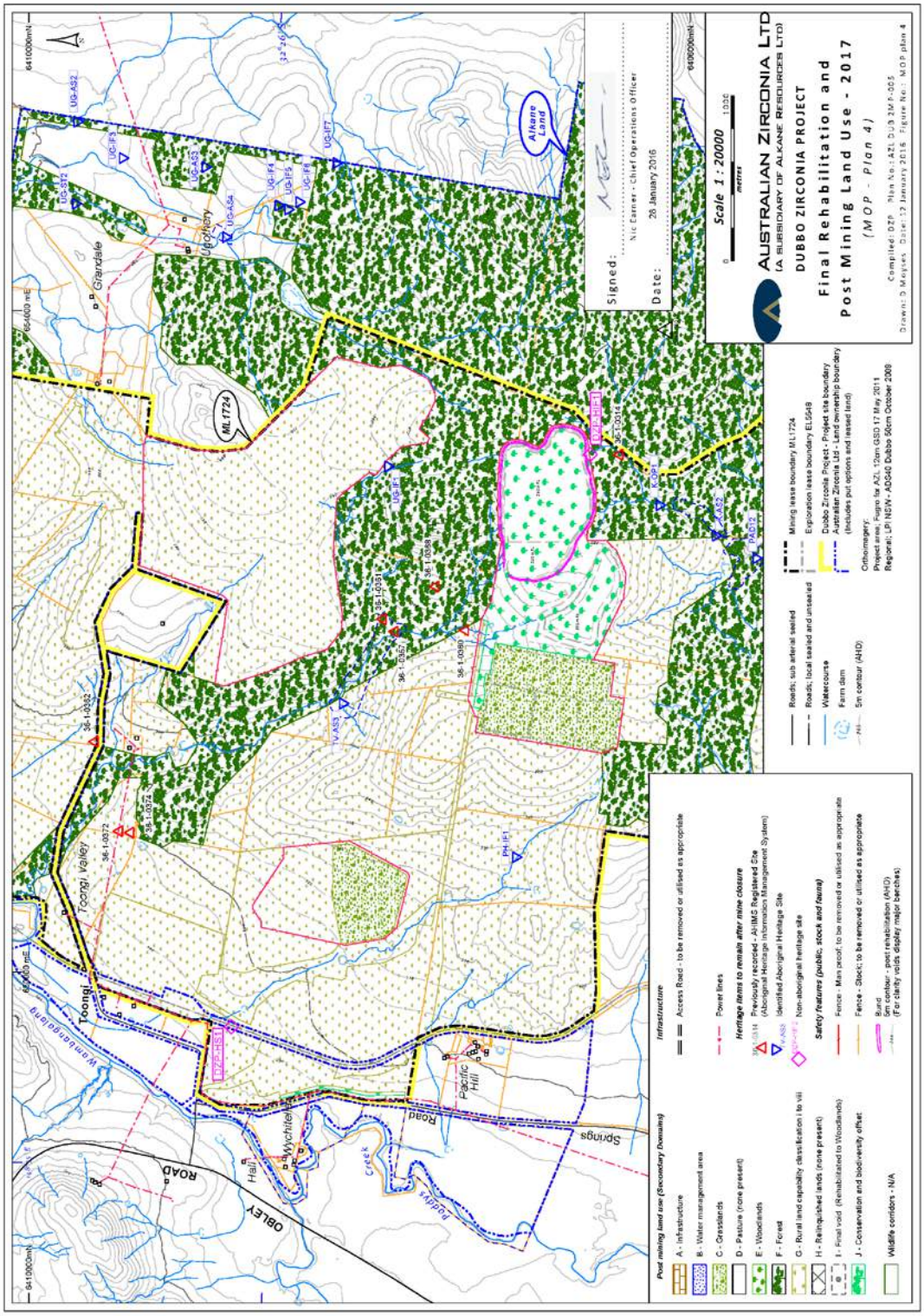
Table 13: Rehabilitation and BOS Objectives and Targets

Category	Objective		Target(s)
	Rehabilitation	**BOA**	
Ecosystem Development (Final Land Use)	Protect, enhance and extend areas of remnant native vegetation.		• Secure the BOA under PVP or equivalent mechanism.
	Maintain habitats on the final landform which encourage colonisation by native flora and fauna with specific niche requirements.		• Species diversity and density of rehabilitated landforms equivalent to analogue sites established within the BOA.
	Extend, improve, protect and link areas of remnant native vegetation.		• Secure the BOA under PVP or equivalent mechanism. • Prepare and implement a Biodiversity Management Plan (BMP).
	Retain areas on the DP Site amenable to future agricultural or industrial activities.	-	• Agricultural productivity of land equivalent to pre-mining landforms.
Post-Mining Land Use	Maximise positive and minimise adverse socio-economic outcomes following mine closure.	-	• Consult with the community and government agencies in relation to the post-mining land use. • Rehabilitate the Mine in accordance with **Plan 4**, unless otherwise agreed.

Table 13: Rehabilitation and BOS Objectives and Targets

Category	Objective		Target(s)
	Rehabilitation	**BOA**	
	Provide rehabilitated woodland communities which adjoin the established Biodiversity Offset Area to maximise the wildlife corridors created within the local setting.	Undertake habitat augmentation to improve and promote corridors for fauna movement linking adjacent remnant woodland vegetation with the rehabilitation of the Mine.	• Establish woodland vegetation over the landform equivalent to local analogues of that community. • Visual identification of wildlife corridors within the largely agricultural setting. • Conserve under a Conservation PVP 1021ha of remnant native vegetation in accordance with a Biodiversity Offset Strategy.
	Integrate areas of biodiversity enhancement and conservation with agriculture.		• Undertake agricultural activities on the Mine Site, including within the BOA in accordance with a PVP and BMP.
Other	Allow for the relinquishment of the Mining Lease and the return of the security lodged over the Mining Lease within a reasonable time after the end of the mine life.		• 50% within 5 years of final rehabilitation. • 100% within 10 years of final rehabilitation.

Figure 6: MOP Plan 4 showing proposed final land uses at DP



7.3 Trials, Monitoring and Research

No trials nor monitoring of rehab was undertaken during this period. During the last reporting period, four benchmark vegetation communities benchmarks were identified and described by OzArk as a goal against which to measure rehabilitation success.

These sites were revisited on 2 December 2016 and the report is contained in Appendix A.

Rainfall from June to December 2016 was near record levels and the vegetation ground cover was potentially well abover average. Two of these sites are on Crown land which is not grazed by livestock.

It has been observed that destocking of large areas of the ASM estate in a wet season has allowed natural regeneration of white box, fuzzy box and white-cypress pine to occur. This natural regeneration is off to a flying start before the biodiversity offset fencing is in place.

7.4 Key rehabilitation risks

A key rehabilitation risk in the next reporting period will be weather related. Stripping and handling topsoil resources should ideally be performed when soils are not too wet nor too dry.

7.5 Actions for next reporting period

Topsoil stripping and stockpiling will take place during the next reporting period. Trials will examine productive pasture establishment techniques on the soil stockpiles. It is intended to establish productive perennial pastures on the soil stockpiles and include those stockpiles as a resource to be opportunely grazed by livestock.

The soil stockpiles will be managed for their long term soil health to ensure they are a suitable medium for the final landform rehabilitation in 20+ years time.

8 Community

8.1 Consultation

The key strategy to ensure an effective passage of information between ASM and the surrounding community is the Community Consultative Committee (CCC). The CCC is an independently chaired ten member committee representing ASM, the local community and the Aboriginal community. During the reporting period, the CCC met on the:

- 2 August 2016;
- 22 November 2016
- Feb 2017 (cancelled due to lack of new information); and
- 2 May 2017.

At CCC meetings, held quarterly, members are updated by ASM personnel on the progress of current and proposed mining operations and projects. Community representatives are given the opportunity to raise concerns regarding the project and to offer advice regarding ASM's consultation with the community. CCC meeting minutes are available via the Alkane Resources website (www.alkane.com.au).

In addition to the CCC, ASM utilised a number of methods of communication/consultation with the community during the reporting period, including:

- Making relevant information regarding mine approvals, operations and environmental monitoring available to the public on the Alkane Resources website;
- Distributing a community newsletter, to provide the Dubbo-Toongi community with information on the DP development;
- Attending vocational and tertiary information days at schools;
- Presentations to interest groups (Rotary, WPRC, schools);
- Providing a 24 hour community information; and
- Sending issue-specific letters to members of the public in response to queries regarding the project.

These methods of community consultation will continue during the next reporting period.

8.2 Support

Over the life of the development, ASM has committed in a Voluntary Planning Agreement to contribute annually:

- $300 000 to the maintenance of Obley/Toongi Road
- $42,000 Roads Contributions (to and from work)
- $42,000 Roads Contributions (other direct vehicle trips for employees) and
- $230 000 for Boundary Road (Keswick Parkway South to Sheraton Road).

CPI adjustment to apply after year one. VPA contirbutions to commence on 1 January or 1 July following commencement of Obley/Toongi Road upgrade.

8.3 Complaints and enquiries

ASM manage complaints in accordance with the protocols and procedures contained in the EMS. During the reporting period no complaints were received.

ASM staff will respond to all complainants and conduct investigations into specific concerns. Investigation outcomes consisting of corrective action, where required, and follow-up communication with the complainant will be actioned.

A register of complaints and enquiries received from the commuinity is maintained by ASM. A modified version of this register (excluding personal details of complainants) is published on the Alkane Resources website.

No complaints have been received to date.

9 Independent Environmental Audit

As per Schedule 5 conditions 9 and 10 of the consent condions:

1. Within one year of commencing development under this consent, and every 3 years thereafter, unless the Secretary directs otherwise, the Applicant shall commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:
   (a) be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;
   (b) include consultation with the relevant agencies;
   (c) assess the environmental performance of the development and assess whether it is complying with the requirements in this consent and any relevant EPL or Mining Lease (including any assessment, plan or program required under these approvals);
   (d) review the adequacy of strategies, plans or programs required under the abovementioned approvals; and
   (e) recommend appropriate measures or actions to improve the environmental performance of the development, and/or any assessment, plan or program required under the abovementioned approvals.

   Note: This audit team must be led by a suitably qualified auditor and include experts in water resource management, ecology, transport and road design and hazardous materials management and any other field specified by the Secretary.

2. Within 6 weeks of the completion of this audit, unless the Secretary agrees otherwise, the Applicant shall submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report, including a timetable for the implementation of any measures proposed to address the recommendations in the audit report. If the Applicant intends to defer the implementation of a recommendation, reasons must be documented.

As construction has not yet commenced, this condition has not yet been triggered.

10 Incidents and non-compliances during reporting period

This section provides further detail on the incidents and non-compliances reported in Section 1 as well as any other official regulatory interaction that occurred during the reporting period.

10.1 Official Regulatory Interaction

No reportable incidents or warning letters, penalty notices or prosecution proceedings by any regulatory agency were received during the reporting period.

Correspondence from DPE is contained in **Appendix E**.

11 Activities to be completed in next reporting period

Environmental activities and initiatives to be implemented in the next reporting period will focus on reduction of offsite impacts such as noise and dust, fencing, management and monitoring of biodiversity offset areas, finalising the final landform plans, and commencing rehabilitation of soil stockpiles and erosion and sediment control structures. Details on these activities are shown in Table 4.

Table 4: Activities proposed for 2017-2018

Proposed Activities	**Location**	**Proposed Completion Date**
Fauna monitoring	DP site and offset areas	Ongoing
Control of noxious weeds	DP site and offset areas	Ongoing
Fencing and signage in accordance with the Biodiversity Offset Management Plan and PVP	Offset areas	30 May 2019
Carry out survey of drainage line B in the BOA for stream bed rehabilitation	Biodiversity and rehabilitation areas	Dec 2017
Pink-tailed Worm Lizard Survey	PTWL Offset areas	Spring 2017 & Autumn 2018
Conduct weed management and rubbish removal	Biodiversity offset areas	2017-2018
Finalise Management Plans and upload to Alkane website	N/A	Dec 2017