McMAHON SERVICES

FlindersPower

ASH DAM REHABILITATION PLAN

Revision	Date	Document type	Description	Origin	Approval
A	1 December 2016	Ash Dam Rehabilitation Plan	Issued for Review	SH	RF/BD
B	2 December 2016		Issued for FP Review	SH	BW/KM
0	9 December 2016		Draft	SH	EPA
1	21 February 2017		Final	SH	BD
2	29 May 2017		Revision 2	FPA	
3	23 June 2017		Rev 3 incoprorating EPA feedback of 7 June 2017	FPA	

Disclaimer Statement

All contents of this document are commercial in confidence. No portion of this document is to be used for any purposes other than evaluation for the specified client including copying, editing and distribution, without the specific written consent of McMahon Services Australia.

Contents

Tables

Figures

Appendices

Document Map

ASH DAM REHABILITATION

APPENDIX A
Revegetation Management Plan

Appendices

APPENDIX A
Augusta Power Station, Borrow Pit & Ash Dam – Native Vegetation Assessment

APPENDIX B
EPA Licence No.13006

APPENDIX C
ECA

APPENDIX D
Photographs

APPENDIX E
Environmental & Community Policy

APPENDIX F
Emergency Response Plan

APPENDIX G
Third Party Reviews

APPENDIX B
Soil Analytical Reports

Documents

Chemical Assessment of Ash

Premium Soil Analysis 071116

Premium Soil Analysis 130217

Technical Memorandum

APPENDIX C
Environmental and Geotechnical

Documents

Environmental and Geotechnical Assessment

APPENDIX D
Stormwater Management

Documents

Ash Dam Site Grading – 16-1423-SK006-B

14151 - Stormwater Report – Rev B

APPENDIX E
Construction Methodology Plan

Appendices

APPENDIX 1
Internal Soil Tracking

APPENDIX 2
Work Zones and Site Facilities

APPENDIX F
Work, Health & Safety Management

Appendices

APPENDIX 1
McMahon Services Work Health and Safety

APPENDIX 2
Flinders Power Health & Safety Policy

APPENDIX 3
Workplace Behaviour Policy

APPENDIX 4
Induction Register

APPENDIX 5
Project Risk Assessment Register (PRAR)

APPENDIX 6
Emergency Evacuation Plan

APPENDIX 7
Traffic Management Plan

APPENDIX G
Environmental Management Plan

Appendices

APPENDIX 1
Flinders Power Environment & Community Policy

APPENDIX 2
Flinders Power Health & Safety Policy

APPENDIX 3
Flinders Power Security & Emergency Management Policy

APPENDIX 4
Fugitive Dust TARP

APPENDIX H
Quality Management Plan

Appendices

APPENDIX 1
Quality Policy

APPENDIX 2
Vital Bon-Matt MSDS

APPENDIX I
Aboriginal Heritage Plan

Documents

IHS Report Port Augusta Power Station Borrow Pit Inspection and Advice

APPENDIX J
Borrow Pit Survey

Documents

Borrow Pit Revised Area

APPENDIX K
Post-Completion Monitoring & Maintenance

Glossary

Term	Definition
ALLIANCE	Unified Management team formed by two entities, MSA & Alinta
ALT	Alliance Leadership Team
AMT	Alliance Management Team
APS	Augusta Power Stations
DEWNR	Department of Environment, Water and Natural Resources
ECA	Environmental Compliance Agreement (2000)
EMP	Environmental Management Plan
EPA	Environment Protection Authority
FP	Flinders Power
FPA	Flinders Power Alliance
FPP	Flinders Power Partnership
MSA	McMahon Services Australia
NVC	Native Vegetation Council
PPE	Personal Protective Equipment
PRAR	Project Risk Assessment Register
QMP	Quality Management Plan
WHSMP	Work, Health & Safety Management Plan
WMS	Work Method Statement. This document sets out the work activities step by step. (This document can utilise other documents such as diagrams, photos and lift studies)

Review, Third-Party Feedback

This Ash Dam Rehabilitation Plan is an overarching document to the suite of management plans for the Ash Dam Rehabilitation Project. This Plan has been reviewed by EPA, DEWNR, Succession Ecology, Merrick Savage (Eyre Native Seeds) and Flinders Power. All parties have provided feedback, which has since been incorporated in this version of the Ash Dam Rehabilitation Plan, Rev 3, 23 June 2017.

1. Introduction

This Ash Dam Rehabilitation Management Plan describes the method by which the Ash Dam located adjacent the Augusta Power Stations site will be rehabilitated.

The Ash Dam Storage Area has a total area of 273 ha comprised of the following:

- Ash Dam – 212 ha
- Former Ash Dam – 36 ha
- Polishing Pond – 25 ha

Collectively the above ash storage facilities are referred to as the Ash Dam. Refer to Figure 1 for location of Ash Dam and Borrow Pit.

The Ash Dam was utilised historically during power generation as a storage area for the management of the slurry formed from mixing of coal combustion residuals with sea water.

The 'drying out' of the Ash Dam, which has commenced following the cessation of the pumping of sea water to the Ash Dam area on 9 May 2016 will provide the potential for significant dust generation from the dry ash material. Potential dust generation from the Ash Dam is a major concern to the Flinders Power Alliance (FPA) as well as various stakeholders including the EPA, due to the close proximity of the site to the townships of Port Augusta and Stirling North.

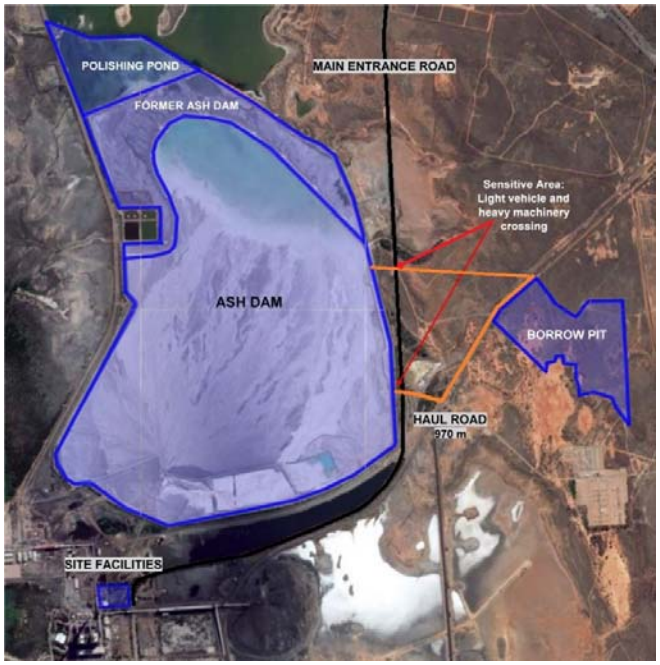

Figure 1 - Location of Ash Dam and Borrow Pit

Flinders Power Alliance is a partnership between McMahon Services and Flinders Power responsible for the implementation and management of the Ash Dam Rehabilitation project.

The proposed actions summarised in this plan have been formulated to provide a solution which addresses the guiding principles developed by Flinders Power (FP) in conjunction with various Stakeholders (including the EPA) as summarised below.

1.1 Guiding Principles

The guiding principles for the project are:

- Efficient construction: the concept is safe and efficient to construct
- Reliable design: the solution is safe for the community and the environment in the long-term
- Dust is suppressed: the concept reduces the potential of dust leaving the site
- Water is managed: the concept allows for safe discharge of water
- Realistic costs: the concept considers costs to Flinders Power through design, minimal maintenance and allows for re-use of the site
- The landform is self-sustaining: zero or minimal ongoing maintenance

- Public nuisance: risks associated with odour and insect breeding in ponded water are managed

1.2 Roles and Responsibilities

Role	Name	Responsibility
Program Manager (FP)		• Chair of the ALT • Accountable for the Project Alliance Principles • Accountable for the Project Alliance Agreement objectives • Accountable for the Project Alliance Communication protocols • Provide Leadership to ensure alignment of the Alliance parties • Endorsement of plans, including the Dust Management Plan and Fugitive Dust TARP • Ensure compliance with Environmental Protection Act, Licence and supporting plans
Facility Manager (FP)		• Accountable for the Project Alliance Principles • Accountable for the Project Alliance Agreement objectives • Accountable for the Project Alliance Communication protocols • Provide Leadership to ensure alignment of the Alliance parties • Lead Stakeholder management and Community Engagement • Leadership of a positive WHSEQ culture

	• Leadership of a positive project culture • Endorsement of plans, including the Dust Management Plan and Fugitive Dust TARP • Ensure compliance with Environmental Protection Act, Licence and supporting plans • Daily surface condition inspections of Ash Dam during demobilisation periods
Project Director (MSA)	• Accountable for the Ash Dam Rehabilitation Program objectives • Accountable for the Quality objectives • Leadership of a positive WHSEQ culture • Leadership of a positive project culture • Accountable for the Ash Dam Rehabilitation Key Performance Indicators • Undertake the scheduled review of key personnel performance • Responsible for the Project Alliance Engineering / Design outcomes
Project Manager (FP)	• Member of the AMT • Responsible for the Project Alliance program and ensuring all activities are completed in line with the program • Responsible for the Commercial outcome of the Project Alliance Agreement • Ensure that safety and environmental risks are managed • Ensure project delivery in accordance with approved plans

	• Actively promote a WHSEQ culture • Communicate with the ALT on WHSEQ, cost, schedule and quality matters • Key site interface
Project Manager (MSA)	• Responsible for the Ash Dam Rehabilitation and ensuring compliance with rehabilitation plans • Responsible for the Ash Dam Rehabilitation program and ensuring all activities are completed in line with the program • MSA contact for all Variations and Additional Work Packages • Responsible for compliance to the Ash Dam Rehabilitation Policies, Procedures and Plans • Ensure that safety and environmental risks are managed • Ensure project delivery in accordance with approved plans • Actively promote a WHSEQ culture • Appoint and manage project personnel to achieve project delivery objectives • Mentor, train project personnel to ensure a highly competent team to achieve project delivery objectives • Communicate with the Flinders Power on WHSEQ, cost, schedule and quality matters • Coordinate and manage the on-site environmental consultants • Review and disseminate all third-party design and analysis

	• Responsible for the Project Alliance Engineering / Design outcomes
Land Management (FP)	• Provide daily weather information • Daily dust and odour monitoring • Ensure real-time dust monitoring is operational, including text alert system • Ensure compliance with the Dust Management Plan and Fugitive Dust TARP • Provide technical advice and support to the Project • Daily surface condition inspections and monitoring of Ash Dam during demobilisation periods • Report findings to the ALT
Site Manager (MSA)	• Manage the day to day manning roster and ensure all manning requirements are conveyed to the Project Manager • Appoint and manage project personnel to achieve project delivery objectives • Key site interface • Accountable for the Ash Dam Rehabilitation objectives • Leadership of a positive WHSEQ culture • Leadership of a positive project culture • Responsible for compliance to the Ash Dam Rehabilitation Policies, Procedures and Plans • Execute the Ash Dam Rehabilitation Plans
Project Engineer (MSA)	• Responsible for data collation, review and management • Provide reporting data

	• Responsible for the Rehabilitation Quality outcomes • Responsible for collating and reporting the Rehabilitation KPI's • Responsible for the Rehabilitation Reporting/tracking • Allocate sufficient resources required to successfully implement the Rehabilitation plans. • Progress claims
WHSEQ Manager (Adelaide based)	• Provide WHSEQ leadership to the Project and Site Manager • Promote a Zero Harm Project and Culture across site • Execute the Rehabilitation Safety Management Plan • Communicate with appropriate stakeholders on OH&S regulations and EPA licence requirements • Recognise and reward safe behaviours • Manage the PRAR
WHSEQ Advisor (Site based)	• Provide WHSEQ leadership to the Project and Site Manager • Promote a Zero Harm Project and Culture across site • Execute the Rehabilitation Safety Management Plan • Manage the Project Alliance Safety KPI's • Communicate with appropriate stakeholders on OH&S regulations and EPA licence requirements • Recognise and reward safe behaviours • Attend the AMT meetings and provide safety updates

	• Manage the PRAR
Senior Surveyor (MSA)	• Detailed surveying • GPS setup/maintenance

1.3 Regulatory framework

Native Vegetation Act 1991

Clearance of vegetation outside of the metropolitan area in South Australia is regulated by the *Native Vegetation Act 1991* (NVA 1991). Under this Act vegetation may only be cleared where the Act specifically permits such clearance under regulations or where the Native Vegetation Council (NVC) approves an application.

As defined in Schedule 1 of the Native Vegetation Act 1991, the NVC considers applications to clear native vegetation under thirteen principles. Native vegetation should not be cleared if it is significantly at odds with these principles:

1) it comprises a high level of diversity of plant species; or
2) it has significance as a habitat for wildlife; or
3) it includes plants of a rare, vulnerable or endangered species; or
4) the vegetation comprises the whole, or a part, of a plant community that is rare, vulnerable or endangered; or
5) it is significant as a remnant of vegetation in an area which has been extensively cleared; or
6) it is growing in, or in association with, a wetland environment; or
7) it contributes significantly to the amenity of the area in which it is growing or is situated; or
8) the clearance of the vegetation is likely to contribute to soil erosion or salinity in an area in which appreciable erosion or salinisation has not yet occurred or, where such erosion or salinisation has not yet occurred, the clearance of the vegetation is likely to cause appreciable soil erosion or salinity; or
9) the clearance of vegetation is likely to cause deterioration in the quality of surface or underground water; or
10) the clearance of vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding; or

11)

i. after clearance the land will be used for a particular purpose; and

ii. the regional NRM board for the NRM region where the land is situated has, as part of its NRM plan under the *Natural Resources Management Act 2004*, assessed-

(A) the capability and preferred uses of the land; and

(B) the condition of the land; and

iii. according to that assessment the use of the land for that purpose cannot be sustained; or

12) the clearance of vegetation would cause significant harm to the River Murray within the meaning of the *River Murray Act 2003*; or

13) the clearance of vegetation will cause significant harm to the Adelaide Dolphin Sanctuary.

Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* provides a legal framework for the protection of nationally and internationally important flora and fauna, ecological communities and heritage sites. These are termed Matters of National Environmental Significance (NES). If a matter relating to the clearance of native vegetation at the Ash Dam site located at Port Augusta, South Australia is considered to be of NES, then the project would need the approval of the Minister for the Environment.

The nine matters of national environmental significance protected under the Act are:

1) World Heritage properties
2) National Heritage places
3) Wetlands of international importance (listed under the Ramsar Convention)
4) Listed threatened species and ecological communities
5) Migratory species protected under international agreements
6) Commonwealth marine areas

7) Great Barrier Reef Marine Park

8) Nuclear actions (including uranium mines)

9) Water resources in relation to coal seam gas development and larger coal mining development

National Parks and Wildlife Act 1972 SA

The *National Parks and Wildlife Act 1972 SA* (NPW Act 1972) provides for the protection of native flora and fauna in South Australia. The schedules of the Act describe the conservation significance of native plants and animals as rare, vulnerable, threatened or endangered. When considering the extent of impacts of clearance on native vegetation and fauna habitat, the NVC will refer to the NPW Act 1972.

Environment Protection Act 1993

The *Environment Protection Act 1993* provides the regulatory framework to protect South Australia's environment, including land, air and water. This legislation was the result of the streamlined integration of six Acts of Parliament and the abolition of the associated statutory authorities.

The EPA and other bodies administer the Act through a suite of legislative and non-legislative policies and regulatory tools to address environmental issues.

The EPA is also active in implementing and running various programs to raise awareness and educate the public and industry of their environmental responsibilities as a community.

EPA Licence No. 13006

As required under the *Environment Protection Act 1993*, any person or company undertaking any activity potentially harmful to the environment may need an EPA licence.

Due to the nature of activities conducted on the APS site, a licence was issued. This EPA Licence No.13006 imposes conditions to regulate the prescribed activities undertaken on the APS site that may cause harm to the environment. This licence forms an enforceable agreement between the EPA and the parties defined within the licence. All conditions defined within the licence must be strictly adhered to, failure to do so may result in monetary fines or cancellation of licence.

The key, project related Condition of the Licence is as follows:

S-9 Dust Prevention

The licensee must:

- *Take all reasonable and practicable measures to prevent dust leaving the Premises;*
- *Develop a Dust Management Plan to the satisfaction of the EPA; and*
- *Implement the Dust Management Plan approved in writing by the EPA (or any revised plan approved in writing by the EPA).*

Further, licence condition U-124 requires Flinders Power to monitor ambient dust within the community, and provide the results of that monitoring to the EPA.

NOTE: At the time of preparing this plan, *Environmental Authorisation 13006 is being reviewed by SA EPA and FP and is being amended to reflect the revised environmental monitoring requirements during the demolition and rehabilitation period. This section will be updated when the revised conditions have been finalised. This will include any revisions to the FP Dust Management Plan and the supporting document Fugitive Dust TARP for the Ash Storage Area.*

The 'Environmental Compliance Agreement' (2000) sets out the baseline rehabilitation plan for the Ash Storage Area, as per the 'Flinders Power APS Ash Storage Area End of Life Plan Draft Cost Estimate' (14th February 2000). The rehabilitation strategy set out within this document is intended to enhance and refine the baseline plan to ensure that the guiding principles are achieved.

Issued 1st January 2015, this EPA Licence No. 13006 expires 31st December 2019.

Refer to Appendix B of the Revegetation Management Plan.

Work Health and Safety Act 2012 (SA)

The key principles of the laws detailed in the *Work Health and Safety Act 2012* (SA), are consistent with long established workplace safety standards in that they:

- establish health and safety duties, including the primary duty to protect any person from exposure to hazards and risks that arise from work
- provide for worker representation, consultation and participation including through Health and Safety Representatives and Health and Safety Committees

- enable compliance and enforcement through SafeWork SA, the regulator, and
- provide for the creation of Regulations and Codes of Practice.

The *Work Health and Safety Regulations 2012* (SA) identify the control measures that must be applied to specific work activities and hazards, for example machine guarding and noise exposure.

The supporting Codes of Practice provide practical information on how to meet the requirements of the regulations. The Codes are not mandatory but provide information to help workplaces achieve safe systems of work.

Regulatory Framework Summary

These legislative requirements impose a statutory obligation on all employers, employees, subcontractors, designers and manufacturers. It is everyone' s responsibility to ensure that the legislative requirements are strictly adhered to as the minimum standard on this project.

In addition to the legislative requirements, the conditions outlined in the Environment Compliance Agreement (ECA, Appendix C of the Revegetation Management Plan) issued to FPP are required to be adhered to.

McMahon Services will ensure employees and contractors can access copies of the above legislation, Licences and Agreements at all times. Current copies of the above legislation, and any amendments that may arise during the project, shall be maintained by McMahon Services Health, Safety, Environment and Quality (HSEQ) National Manager and will be made readily available through HSEQ and relevant web links to all employees on an as required basis to ensure compliance with the relevant legislation.

The HSEQ National Manager has the overall responsibility to ensure these legislative documents are current.

1.4 Approvals

1.4.1 Native Vegetation Clearance Approval

Native vegetation in South Australia, with the exception of metropolitan Adelaide, is protected by the Native Vegetation Act 1991. This Act is provided to control the clearance of native vegetation, and to preserve and enhance native vegetation within areas of South Australia.

A Native Vegetation Clearance Approval was required prior to the clearance of any native vegetation within the borrow pit area. Subsequently a vegetation assessment conducted by Succession Ecology was undertaken in November 2016. This assessment summarised in the *Augusta Power Station Borrow Pit & Ash Dam, Native Vegetation Assessment* (Appendix A of the Revegetation Management Plan) is inclusive of, but not limited to:

- Site history
- Survey of the vegetation associations
- Matters of conservation significance
- SEB calculations
- Brief revegetation methodology

The Ash Dam Rehabilitation Plan in conjunction with the *Augusta Power Station, Borrow Pit & Ash Dam, Native Vegetation Assessment* dated November 2016 was sent to DEWNR in November 2016. An Advice of Understanding granting approval of native vegetation clearance was received on 24th November 2016.

A subsequent request for additional borrow pit land clearance was made to the Native Vegetation Council. Approval was granted for the clearance of (up to) a subsequent 19.5ha of land, as set out within Decision Notification 2017/2007/600 (12 April 2017).

1.4.2 Aboriginal Heritage

"Protection of Aboriginal sites, objects and remains

23 – Damage etc to sites, objects or remains

A person must not, without the authority of the Minister –

(a) damage, disturb or interfere with any Aboriginal site; or

(b) damage any Aboriginal object; or

(c) where any Aboriginal object or remains are found –

(i) disturb or interfere with the object or remains; or

(ii) remove the object or remains." (Aboriginal Heritage Act 1998)

On completion of an Aboriginal Cultural Heritage desktop risk assessment and site inspection, IHS (Integrated Heritage Services Pty Ltd) determined it was not necessary to lodge an application for approval to conduct works on-site as the project area is on freehold land where Native Title is extinguished.

Although the site is not protected under Native Title, as the Davenport Substation Artefact Scatter intersects the work zone, as a precaution qualified Senior Archaeologist, , will be engaged when working around these areas.

2. Background Information

The Augusta Power Stations (APS) have a long and valued history providing reliable generation to the South Australian and National Electricity Market. The 90MW Playford A Power Station was commissioned on reclaimed land at the northern tip of Spencer Gulf in 1954. The site was subsequently expanded to accommodate the 240MW Playford B Power Station, which was commissioned in 1963. Generation was secured through the utilisation of the Leigh Creek Coalfields, and the construction of the 544MW Northern Power Station in 1985.

In 1999 the assets were privatised, with the formation of the Flinders Power Partnership (FPP) as the asset owner and the Flinders Operating Services as the agent for the FPP in conducting operations and maintenance. Jointly, the operations are known as the 'Flinders Operations'. South Australian Government control was retained under the Electrical Disposal and Restructuring Act (1999) and the Flinders Power Generation Business Sale Agreement (2000), with the subsequent formation of subordinate leases, including:

- Northern Land Lease
- Playford Land Lease
- Northern Generating Plant Lease
- Playford B Generating Plant Lease
- Leigh Creek Township Lease
- Leigh Creek Railways Sub-Lease

The Ash Dam and proposed borrow pit are located outside of the leased land, on Flinders Power owned freehold land.

Since 2000, Flinders has undergone a series of successive ownership changes, the most recent on 30 June 2016 when the ownership was transferred from Alinta Energy to Flinders Power Partnership.

The Flinders sites have been major employers in the Far North region of South Australia. ACIL Allen in a 2015 report estimated an annual contribution by the business to the regional economy in the vicinity of $180M, and direct employment of over 450 staff. Consistent with the Augusta Power Closure Program, the Ash Dam Rehabilitation as part of the Augusta Power stations will have a direct social and economic impact on the region, and the project plans are

mindful of maintaining a strong valued legacy, while assisting workers and the broader community to prepare for a future without the Flinders Operations.

The Ash Dam is located on the allotment defined by Certificate of Title 6180 Folio 724, Allotment 8 of Deposited Plan 55700.

The Ash Dam is a large interconnected structure comprising an area of approximately 273 ha. Bottom ash from Playford B and Northern Power Stations have been mixed with seawater, and deposited in the southern end of the Ash Dam since the 1980' s. As the ash slurry flows to the north, the ash particles fall from suspension and the resulting supernatant is returned to the Spencer Gulf via the Polishing Pond weir outlet to Hospital Creek. The quality of the water is subject to biennial salinity, trace element and nutrient monitoring as per the conditions of the Environmental Compliance Agreement (2000).

Over the years, the ash has been investigated as a source of building material, concrete additive and rare earth extraction, however, to date these concepts have not proven to be economically viable.

The Flinders Power APS Ash Storage Area End of Life Plan Draft Estimate is defined under the ECA. Golder Associates and Coffey Environments Australia have completed various assessments to characterise the Ash Dam.

A key hazard associated with the management of the Ash Dam is the control of the dust. Whilst the Northern and Playford Power Stations were operational, dust control was achieved via the continuous pumping of an ash / seawater slurry into the dam. The slurry would find a natural path across the dam and maintain saturation of the surface of the Ash Dam in turn limiting fugitive dust emissions. During this process, high spots formed a salt crust which also facilitated dust control.

During the historical operation of the Power Station and associated Ash Dam facility, risk events would be experienced when heavy rainfall, followed by strong drying winds, would dissolve the crust leading to the potential generation of dust.

These events historically were typically of short duration and were mitigated once the slurry again re-sealed the Ash Dam surface.

3. Environmental Setting

3.1 Biological Environment

The project area is located within part of the Gawler bioregion, and Myall Plains subregion. The Gawler bioregion stretches to Port Augusta from north-west Spencer Gulf, inclusive of the Middleback and Gawler Ranges, extending north towards Tallaringa Conservation Park.

Characterised by granite rocky outcrops, vast plains and salt lakes, the Gawler bioregion covers an area of 123,605 km^2. The bioregion is situated on a climatic gradient, transitioning from the temperate conditions of the south and the semi-arid to arid regions of the north, making it an ideal climate for a transition zone for many South Australian species of flora and fauna.

The Port Augusta area is a semi-arid area, with an average maximum annual temperature of 24.7^{o}c, and an annual rainfall of 257 mm (Bureau of Meteorology). The Flinders Power property is approximately 7 metres above sea level with full coastal exposure, resulting in moderate to high wind speeds experienced over the property and highly saline ground conditions.

3.2 Previous Biological Surveys

A vegetation survey conducted in the area to the east of the Ash Dam and south of the proposed borrow pit by the Electricity Trust of South Australia and the South Australian Department of Mines and Energy was conducted in April 1976. It was found that the vegetation present on the property was closely related to the soil type and soil salinity. The borrow pit area was dominated by *Acacia* spp., with a lesser presence of *Myoporum* sp. However, due to the disruption to the borrow pit site, this area favoured the growth of introduced species *Schinus molle* and *Nicotiana glauca*.

The shrubland communities on the property were defined as Atriplex dominant or Maireana dominant. Both of these communities were in the immediate areas surrounding the Ash Dam and borrow pit.

A native vegetation assessment was undertaken in 2016 over the entire 58.7 ha proposed borrow pit area located to the East of the Ash Dam to assess the most suitable area for the proposed 20 ha borrow pit to minimise impact on native vegetation.

The findings of the Native Vegetation Assessment are included in the 2016 Native Vegetation Assessment attached as Appendix A to the Revegetation Management Plan.

4. Management Objectives and Key Constraints

4.1 Objective

The objective of the Ash Dam Rehabilitation Plan is to provide the management measures required for the successful rehabilitation of the Ash Dam and proposed borrow pit.

The Ash Dam Rehabilitation Plan has been completed in conjunction with the *Augusta Power Station, Borrow Pit & Ash Dam, Native Vegetation Assessment* dated November 2016 to facilitate Native Vegetation clearance approval for the proposed borrow pit area at the APS site. Approval to clear native vegetation was granted in November 2016 with subsequent approval to expand the borrow pit in April 2017.

The rehabilitation methodology is based on the established Guiding Principles (summarised in Section 1.1).

4.2 Key Constraints

4.2.1 Soil and Ash

A number of soil and ash chemical analyses have been undertaken of the Ash Dam throughout 2016, with the last analysis inclusive of the borrow pit area completed in February 2017. The analysis of material samples retrieved from the Ash Dam and borrow pit provide an indication of potential measures that may be required for a viable revegetation program to be successful.

The latest soil samples were collected on the 5th of February 2017 in 20 kg sample bags from 4 different locations within the open section of the borrow pit, approximately 1.5 m below ground level. SMS Geotechnical conducted several geotechnical tests on 10 February 2017 which included Particle Size Distribution and Consistency Limits in accordance with AS1289. SMS Geotechnical described the four samples as red brown sandy clay with low plasticity and a range of approximately 30 to 50% fine to course sand.

APAL undertook soil nutrient analysis on the four soil samples. These were compared to optimum nutrient ranges for dryland pasture and are presented in Appendix B.

The following documents are provided within Appendix B:

- Premium Soil Analysis 071116, provided by Apal
- Premium Soil Analysis 130217, provided by Apal
- Chemical Assessment of Ash, provided by Coffey
- Technical Memorandum, provided by Golder Associates
- Borrow Pit Samples Chain of Custody
- Borrow Pit Soil Sample Locations
- Universal Transverse Mercator Coordinates of Borrow Pit Samples
- Particle Size Distribution & Consistency Limits Test Report, provided by SMS Geotechnical

Golder Associates completed an Environmental and Geotechnical Assessment for the Ash Dam in 2015. The assessment included general advice relating to the potential geotechnical and environmental conditions of the Ash Dam. Additionally, a constraints and opportunities assessment was completed in the context of closure and/or divestment. The Golder Associates Ash Dam Environmental and Geotechnical Assessment is attached to this document as Appendix C.

4.2.2 Landform Stability

Dynamic Cone Penetrometer (DCP) tests were completed at six locations at the Ash Dam in November 2015. The DCP testing method involves dropping a 9 kg hammer from a distance of 510 mm, to strike an anvil assembly driving a 16 mm cone-tipped rod into the ground. The results indicated that the ash is weak, with a soft to very soft consistency. The results from the environmental and geotechnical assessment are provided in Appendix C.

5. Scope of Works

The proposed concept to successfully complete the rehabilitation of the Ash Dam in accordance with the established guiding principles, can be summarised into five distinct scopes of work as follows:

(1) The sealing of the Ash Dam with dust suppressant

(2) The progressive sealing of the Polishing Pond with material from the adjacent borrow pit to control odour as it commences dry-out

(3) The planning for full rehabilitation of the Ash Dam, Former Ash Dam and Polishing Pond

(4) The implementation of the Ash Dam rehabilitation and Borrow Pit works

(5) Post completion monitoring and maintenance

5.1 Dust Suppressant

A successful trial for the application of the Vital Chemical, Vital Bon-Matt Stonewall (IGD) was completed over 15 ha of the Ash Dam site on 24 August 2016 via a fire-bombing plane (Air Tractor 802).

A full-scale program, based on the successful trial, was developed to enable to complete coverage of the Ash Dam with dust suppressant. The dust suppressant used was the Vital Chemical Vital Bon-Matt Stonewall (IGD) and application was required at an approximate 10% dilution. Green dye was added to the reagent to allow for the visual confirmation of the application. The majority of the reagent was applied via aerial application, whilst the perimeter areas and areas affected by channelling are to be carried out from haul roads via spraying from a water cart.

Application occurred in accordance with Ash Dam Sealing Proposal 071116, as supplied and approved by the EPA.

5.1.1 Dust Suppressant Products

Vital Chemical, Vital Bon-Matt Stonewall

Vital Bon-Matt Stonewall manufactured by Vital Chemical, is a heavy duty, multipurpose dust and erosion control chemical. The suppressant is recommended for a range of applications including but not limited to:

- Revegetation and ground control
- Long-term stockpiles
- Soil stabilisation
- Exposed soil, sand or aggregate
- Berms and swales

Forming a strong, flexible and long acting surface coating, penetrating and binding the below application surface. The chemical provides an environmentally sound, immobile formula, free of heavy metals, minerals or solvents.

Vital Bon-Matt Stonewall will be applied at a dilution of 10% to the Ash Dam Storage Area.

This suppressant has been used on a wide range of projects and has not shown to hinder or adversely affect plant growth.

Refer to Appendix 2 of the Quality Management Plan for Vital Bon-Matt MSDS

Vital Chemical, Vital Bon-Matt HR

Vital Bon-Matt HR manufactured by Vital Chemical, is a heavy-duty dust suppression technology specifically designed for high traffic unsealed road surfaces, hardstand and laydown areas.

Forming a strong, flexible and long acting surface coating, penetrating and binding the below application surface. The chemical provides an environmentally sound, immobile formula, free of heavy metals, minerals or solvents.

Vital Bon-Matt HR will be applied at a dilution rate of between 2 to 5% to the unsealed roads on the project site and access tracks within the borrow pit.

This suppressant has been used on a wide range of projects and has not shown to hinder or adversely affect plant growth.

Refer to Appendix 2 of the Quality Management Plan for Vital Bon-Matt MSDS

General Dust Suppression

Freshwater sourced from either mains or SA Water WWTP will be applied on an as-needs basis throughout the duration of works on-site. Generally, the water will be applied by a land based method such as via a watercart.

Refer to the Fugitive Dust TARP appended to the Environmental Management Plan.

5.1.2 Dust Suppressant Availability

On-site there are currently 23 IBCs of Vital Bon-Matt Stonewall, and 20 IBCs of Vital Bon-Matt HR. A balance of approximately 10 IBCs of each will be on-site at all times as a contingency. Located in Brisbane, the supplier Vital Chemical, have these items in stock and ready to deliver within three days.

Further detail on dust suppression, contingencies and measures can be found within the Fugitive Dust TARP appended to the Environmental Management Plan.

5.2 Planning

Native Vegetation Clearance Process

It was determined that a 20 ha area is required to supply a total 409,500 m^3 of soil to cover the 273 ha Ash Dam to a depth of 150 mm. The financial and environmental benefits were taken in to consideration when selecting this area, and whether material for the Ash Dam could be sourced from another location. This location provided greatest environmental and financial benefit.

Succession Ecology, a NVC accredited consultant, was engaged on behalf of Flinders Power Alliance (FPA) to assess the composition and condition of vegetation communities present at the proposed borrow pit site, as per DEWNR guidelines. The assessment of a Significant Environmental Benefit (SEB) ratio for each site was completed, and included within the data report, as required by the Native Vegetation Council for assessment.

A Decision Notification has since been received from the Native Vegetation Council, granting approval to clear native vegetation from the borrow pit area.

Subsequently it was determined that the original 20ha borrow pit area would not provide sufficient soil for the project, due to shallower than expected depths to groundwater and areas

quarantined adjacent to high voltage pylons and areas of high preservation value. A subsequent request for additional borrow pit land clearance was made to the Native Vegetation Council. Approval was granted for the clearance of (up to) a subsequent 19.5ha of land, as set out within Decision Notification 2017/2007/600 (12 April 2017).

EPA Plans

Additionally, a number of management plans are required to be completed and approved by FPA and stakeholders (EPA), including the following:

- Construction Methodology Plan
- Revegetation Management Plan
- Environmental Management Plan
- Traffic Management Plan
- Stormwater Management

Capping Layer Depth

It must be clearly understood that the ash itself can support plant growth. It is neither 'toxic' or unsuitable for plant growth. It does, however, have low carbon and nitrogen concentrations which limit full plant function, and has been inundated with seawater for many decades. Isolated areas of the ash dam where seawater has not been present have a number of plant species growing, with individual saltbush plants being very well established. In addition, plant growth trials undertaken by Flinders Power in 2016 in areas of the Ash Dam which had only recently ceased seawater inundation, showed that plants survived and grew.

The use of a 150 mm soil layer over the top of the ash is being undertaken to increase the success of plant establishment. As sodium leaches through ash from seasonal rainfall, soil carbon increases from natural cycling processes, nitrogen increases from fertiliser addition and natural cycling processes and the soil being a source of trace elements, it is expected the plants will set roots into the ash like any growing medium.

Regardless, an independent third-party reviewer has been engaged as suggested by DEWNR to make comment of certain parameters of the Ash Dam Rehabilitation Plan, including the 150 mm soil depth. of Eyre Native Seeds has been selected for the third-party review based on DEWNR's recommendation, and commenced his work with a site visit on the

1st February 2017. has assessed the proposed soil depth as well as other factors to consider in relation to the soil depth including total volume of soil required, volume of soil available and costs. states that the 150 mm thickness of soil is adequate.

Succession Ecology also provided a response in relation to the feedback provided by DEWNR. Both of these reports has been included as Appendix G in the Revegetation Management Plan.

Soil and Ash Characteristics

A minimum 150 mm thick layer of the soil will be emplaced across the Ash Dam, overlaying the ash. The analytical results of the ash and soil show that each is relatively low in nitrogen and organic carbon, the ash having close to none, as well as both being relatively high in sodium and chloride. Both mediums are able to support plant growth, as demonstrated by established vegetation in the borrow pit area where the soil will be sourced, and plants establishing on areas of the Ash Dam.

The ash has relatively high levels of phosphate, potassium and other trace elements, typical of ash, which will provide plants with the required sources once roots have been established. Organic carbon is present in the borrow pit soil, and existing vegetation will be mixed in through the soil to be applied to the Ash Dam. In addition, through the usual nutrient cycling of the vegetation on the ash Dam, organic carbon levels will progressively increase over time.

To assist plant growth, a fertiliser will be delivered across the Ash Dam as detailed in the Revegetation Management Plan.

Site Contamination Assessment

The Ash Dam forms part of the scope of the EPA-approved Voluntary Site Contamination Assessment Proposal (26th September 2016) for the Augusta Power Stations. Coffey Environments are the appointed Site Contamination Consultant and Kirsa Environmental are the appointed Site Contamination Auditor. At the time of preparing this document, Coffey had completed the Detailed Site Investigations and submitted it to the EPA (28th February 2017). The Ash Dam area forms part of the Detailed Site Investigations and is also subject to Auditor review. The draft Ash Dam Rehabilitation Plans have been provided to both Coffey Environments and Kirsa Environmental for review.

5.3 Sealing of Polishing Pond

To mitigate the odour emitting from the Polishing Pond created from the drying out of organic material associated with the former aquatic environment, soil will be spread across the Polishing Pond area once the area is sufficiently dry to enable safe access. The growing medium will be sourced from the 20 ha borrow pit, east of the Ash Dam. Soil will be directly loaded by excavator into articulated dump trucks, transported to the Polishing Pond and unloaded. It is proposed that a low-ground pressure GPS fitted earthmoving machine, such as the PistenBully, will be used to spread the soil to an average depth of 150 mm across the whole of the Polishing Pond area. These works are in accordance with the Polishing Pond Interim Sealing Plan 241116 and Risk Assessment.

As per the Stormwater Management (Appendix D), the existing contours provide suitable provision for detention, with no expectation of excessive velocity in the event of a 1 in 100-year storm.

5.4 Rehabilitation and Borrow Pit Works

The implementation of the Ash Dam Rehabilitation and borrow pit works comprises of:

- Obtaining approval for native vegetation clearance.
- Applying dust suppressant to the Ash Dam Area, via application of Vital Bon-Matt Stonewall, to create an interim seal
- Applying dust suppressant, Vital Bon-Matt HR to roads on an as required basis.
- Provision of odour management measures to Polishing Pond.
- Collection of seed for revegetation of Ash Dam and borrow pit.
- Preparation of borrow pit including clearance of vegetation following native vegetation clearance approval.
- Excavation of an estimated volume of 460,000 m^3 of soil from the borrow pit area to utilise for a growing medium at the Ash Dam

- Construction of embankments across the Ash Dam to facilitate emplacement of growing medium across the Ash Dam. Pushing out of the growing medium material from the embankments using low ground pressure machinery to an average depth of 150 mm.
- Preparation of soil for sowing of seed, harrow entirety of Ash Dam with low ground pressure machinery.
- Seed Ash Dam, by either:
    - **Hand Broadcasting**

      The seed, mixed with a carrying substrate (vermiculite) will be thrown by hand onto the site. A team of people will be engaged to hand sow the seedlot across the 273 ha Ash Dam Storage Area and borrow pit site. The work group will consist of four teams people, with one person providing troubleshooting and logistical support.

      OR

    - **Mechanical Broadcasting**

      The seed, mixed with a carrying substrate (vermiculite), will be broadcast through a mechanical seeder (air seeder, belt spreader, pendulum spreader, drill/combine seeder or super spreader).
- Supply and apply fertiliser to Ash Dam area to promote plant growth.
    - The fertiliser, rate of application and method of application is yet to be confirmed.
- Revegetate borrow pit using same methodology as Ash Dam.
- Apply dust suppressants to Ash Dam and borrow pit areas on an as required basis until establishment of vegetation.
- Construct windbreaks if contingency measures to mitigate fugitive dust are not proving suitable.

It is intended that as each section of soil is spread over the Ash Dam, water (with or without a dust suppression reagent) will be applied to the surface. This application will stabilise the soil to prevent fugitive dust emissions.

Seeding will then progressively occur pending amendable weather conditions, to allow progressive revegetation.

Utilising the method of Succession, it is expected that coloniser species will have established root systems within the first 0-2 months of seeding. Root systems provide soil stabilisation by the binding of soil particles, and foliage provides ground surface protection from the impacts of rain and erosion.

The Construction Methodology Plan (included in Appendix E) provides further detail regarding the execution of all tasks to be undertaken for this project.

It is to be noted that the infrastructure on-site, such as the decant towers, will remain to allow for future utilisation if the site were to be repurposed. This will have no effect on the water runoff or detention.

5.5 Post-Completion Monitoring and Maintenance

In conjunction with Eyre Native Seed, Flinders Power Alliance have developed an Ash Storage Area Post-Completion Monitoring and Maintenance Plan that sets out the arrangements for ongoing management of the area by current and future land owners. This Plan has since been reviewed by Succession Ecology.

Monitoring of the rehabilitated Ash Dam site shall occur in accordance with Appendix K, Post-Completion Monitoring and Maintenance Plan.

On completion of each site inspection, an inspection report will be submitted to McMahon Services and Flinders Power in a timely manner. This report will be inclusive of an assessment of vegetation die-off, assessment of scouring/erosion, site security and any other matter which may adversely impact the site. Maintenance will be scheduled based on the outcome of each inspection.

The Revegetation Management Plan is attached as Appendix A.

5.6 Source Materials

The proposed growing medium will be recovered from the 30 ha borrow pit, located to the east of the Ash Dam.

The borrow pit will be progressively stripped and cleared of native vegetation. A cut analysis plan is provided in Appendix J, Borrow Pit Survey.

The material will be mixed and extracted from the borrow pit with 30T excavators alongside D9 dozers. Access to the borrow pit and safe trafficability will be provided by the dozers. The soil will be directly loaded into articulated dump trucks using the excavators, transported to the Ash Dam site and unloaded for subsequent spreading.

The borrow pit will be graded upon completion to provide a gradual slope to the south east and will be matched in at the boundaries. A 33% batter for the slopes has been allowed.

5.7 Subcontractor Selection and Management

5.7.1 Subcontractor selection

Prior to commencing work for McMahon Services Australia, the Subcontractor Company shall be assessed to ascertain whether the company has the capability of delivering work:

- while achieving and upholding benchmark WHSEQ requirements, and supporting WHSEQ plans for the project,
- while adhering to all project plans whilst on-site,
- with plant fit for purpose and inspected and serviced to manufacturers requirements,
- that does not adversely impact on the environment,
- that is to the agreed workmanship,
- that is free of defects, and
- is completed within the agreed time frame.

Subcontractor contract companies must hold the necessary registrations, Licences and insurances to operate as a business and to perform certain tasks.

5.7.2 Subcontractor Management

In addition to above requirements, subcontractors must participate in all project WHS activities including;

- Any inductions required to enable works on site
- Daily pre-start meetings
- Site inspections
- Toolbox meetings
- Safe Act Observations
- Contribute to the project KPIs
- Participate in Safety Focused moments
- Report any hazards / incidents to the Alliance in a timely manner

(Refer to SP 220 Subcontractor Management)

It is a requirement that all subcontractors engaged for this Project shall be made aware of all relevant project plans and EPA Licence No. 13006 conditions when inducted to site, and subsequently adhered to while on-site for the project duration. This includes key controls listed under the Dust Management Plan and Fugitive Dust TARP.

5.8 Plant & Equipment

The Ash Dam Rehabilitation requires extensive civil works to be undertaken. Where possible, low-ground pressure earthmoving equipment have been selected due to the soft surface of the Ash Dam.

Exclusion zones will be established around the works to delineate personnel from the plant and equipment. The delineated areas are to be maintained with access only to required personnel. Signage will be erected to warn of dangers in the area. Spotters with radio contact to operators will be utilised where delineation cannot occur, flashing light and audible reverse beepers on all mobile plant on-site. The spotter to stay in visual or radio contact with the operator providing positive communications at all times. Flashing lights and reversing alarms will be fitted to all plant. Ticketed / competent operator to operate plant only.

A list of plant to be used for the Ash Dam Rehabilitation works is as follows:

- 2 x 30T Excavator
- 8 x Articulated Dump Truck
- 1 x D9 Bulldozer
- 4 x Low Ground Pressure D6 Bulldozer
- 1 x D6 Bulldozer
- 1 x Grader
- 2 x Water Cart
- 1 x PistenBully
- 1 x Quick Fill
- 1 x Isuzu Service Truck

Plant and equipment used on the project are subject to a comprehensive safety compliance check and daily equipment pre-start check (including a complete service history).

Additional plant and equipment required for the upcoming seeding events are currently being organised. A temperature controlled and de-humidified shipping container will be delivered to site in early June 2017 for the storage of seed.

5.9 Handover

All works contained within the scope will be completed to a standard that is accepted by the Alliance Leadership Team (ALT). The final status of the project will include the handover of the site, in a clean and appropriate manner allowing the site to be used as a natural, self-sustaining landform. All items and waste associated with the project will be removed from site.

The final handover documentation will include any documentation required by the government authorities that may be passed on to respective parties including future stakeholders. The safety data will include records of the man hours and any incidents in detail. All key performance indicators will also be included as a record of progress and success of the works.

6. Ash Dam Rehabilitation Sequence

Works will progress in a sequence that best complements the requirements of the wider site project and project objectives. The sequence is as follows:

- Stage 1: Planning, approvals, development of management plans and native vegetation clearance.
- Stage 2: Collection of specifically selected native seeds for the site with the objective of rehabilitation in a low rainfall and high saline environment (complete seedlot ready for application April/May 2017).
- Stage 3: Procurement of dust suppressant reagent and delivery to APS.
- Stage 4: Application of dust suppressant interim seal by fire-bombing plane to the Ash Dam.
- Stage 5: Application of odour suppressant and backfill Polishing Pond with borrow pit material.
- Stage 6: Survey proposed borrow pit site, identifying exclusion zones (Aboriginal Heritage and existing SEB zones).
- Stage 7: Establish site facilities.
- Stage 8: Strip borrow pit site of vegetation.
- Stage 9: Excavation, loading and emplacement of soil layer across the Ash Dam, including construction of fingers across the Ash Dam to facilitate emplacement.
- Stage 10: Broadcasting of specifically selected and harvested native seeds across the entire Ash Dam.
- Stage 11: Application of fertiliser following an establishment period of approximately four weeks and subject to plant establishment.
- Stage 12: Dust suppression activities to be undertaken throughout the Civil works.
- Stage 13: Monitor and maintain Ash Dam and borrow pit areas.

6.1 Rehabilitation Schedule

The schedule for the rehabilitation of the Ash Dam is summarised in Table 1.

Table 1 – Ash Dam Rehabilitation schedule

	Responsibility	Q4 2016	Q1 2017	Q2 2017	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	2019
Unit 1: Interim Sealing											
Submit proposal to EPA	FP (MSA support)	**X**									
Prepare & conduct community communication	FP (MSA support)	**X**									
Conduct sealing application	MSA (FP support)	**X**									
Unit 2: Polishing Pond Sealing											
Polishing pond progressive infill works	MSA (FP support)	**to be determined pending ongoing safety/accessibility assessment**									
Unit 3: Planning											
Commence seed collection	MSA	**X**									
Develop detailed plans & submit to EPA	MSA & FP	**X**	**X**								
Approval to commence works	EPA & DEWNR		**X**								
Unit 4: Ash Dam Rehabilitation											
Conduct earthworks	MSA (FP support)		**X**	**X**	**X**	**X**	**X**				

	Responsibility	Q4 2016	Q1 2017	Q2 2017	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	2019
Stormwater controls	MSA (FP support)		X	X	X	X	X				
Conduct seeding	MSA (FP support)			X	X			X			
Fertiliser as required	MSA (FP support)				X	X			X		
Unit 5: Post-Completion Monitoring & Maintenance (refer Appendix K for the full schedule)											
Ongoing monitoring & maintenance	FP						X	X	X	x	x
Dust Monitoring											
Select and order ambient monitoring equipment	FP	X									
Receive, install and commission ambient monitoring equipment	FP	X	X								
Use of monitoring data to inform TARP	FP & MSA		X	X	X	X	X	X	X	x	x

7. Supporting Plans and Documents

The Ash Dam Rehabilitation Plan is one document within the full suite of documents developed for the full rehabilitation of the Ash Dam. Numerous other documents are cross-referenced throughout, and include the following:

- Construction Methodology Plan
- Work, Health & Safety Management Plan
- Environmental Management Plan
- Revegetation Management Plan
- Quality Management Plan
- Stormwater Management
- Aboriginal Heritage Plan

7.1 Construction Methodology Plan

The Construction Methodology Plan details the construction process and methodology for the rehabilitation of the Ash Dam.

This Construction Methodology Plan constitutes part of a suite of documents developed by the Alliance.

The plan will act as a communication mechanism to inform all stakeholders of operational and management protocols implemented across the site.

The Construction Methodology Plan is appended to this document as Appendix E.

7.2 Work, Health & Safety Management Plan

This Work, Health & Safety Management Plan (WHSMP) has been prepared to manage the potential WHS risks associated with activities on this project. The plan outlines the policies, procedures and requirements for the control of the Work, Health and Safety risks associated with the scope of works for the Ash Dam Rehabilitation project.

The management of safety, environmental and quality risks are identified through the hazard identification and risk control process (HIRAC), assessing the risk associated with those hazards, implementing effective controls and reviewing those controls to ensure effectiveness is maintained.

Supporting documents include:

- Environmental Management Plan (EMP)
- Quality Management Plan (QMP)
- McMahon Services Group System Procedures (SP)
- Safe Work Instructions (SWI)

The Work, Health & Safety Management Plan is included as Appendix F.

FlindersPower McMAHON SERVICES

KPI Calculator — Revision Date : 12th January 2017

Work Package: 11

	Measure	
Element	**KPI Weighting**	**Score Outcome**
Safety and Environment (Lead indicators)	30%	30%
Safety and Environment (Lag Indicators)	25%	25%
Workforce	5%	5%
Schedule	10%	10%
Team Work	10%	10%
Integrity	5%	5%
Risk Management	5%	5%
Community	10%	10%
TOTAL	100%	100%

Element	Key Performance Indicator	Target	Score Breakdown Weighting	Actual Score out of 100%	Weighted Score Outcome
Safety & Environment		Max Weighting	30%	Actual Score	30%
Lead metrics	Opportunity for improvement reports (hazard, near miss and process improvement reports)	1 per 250hours worked	2.5	1	2.5
	Safe act observations	1 per 500hours worked	2.5	1	2.5
	Visiting manager inspections	1/month	2.5	1	2.5
	Management Commitment	At least:			
		- Lead 1 pre-start/month	1.875	1	1.875
		- 1 x SWMS review/month	1.875	1	1.875
		- 1 x JSEA review/month	1.875	1	1.875
		- 1 x SAO/month	1.875	1	1.875
	Daily pre-start and weekly toolbox (including workplace inspection)	1 x pre-start/day	1.25	1	1.25
		1 toolbox/week	1.25	1	1.25
	SWMS & JSEA review	All SWMS and JSEA's reviewed and updated monthly	2.5	1	2.5
	High-risk work independent verification	ALT sign-off for all high-risk works - verified prior to commencement	5	1	5
	Internal audit	Quarterly audit indicating no major non-conformances of:			
		- HSE Fundamentals	1.25	1	1.25
		- High risk areas	1.25	1	1.25
	External audit	6 monthly audit indicating no major non-conformances with:		1	0
		- H&S Framework, including statutory compliance	1.25	1	1.25
		- National OHS Self-Insurers Audit Tool	1.25	1	1.25
Safety & Environment		Max Weighting	25%	Actual Score	25%
Lag metrics	Fatalities	Zero for project	17.5	1	17.5
	No Enforceable Probation Notices (Safework SA & EPA)	Zero for project	2.5	1	2.5
	LTIFR	8.5	2.5	1	2.5
	TRIFR	10.5	2.5	1	2.5
Workforce		Max Weighting	5%	Actual Score	5%
	Industrial disputes	Zero disputes that significantly impacts the project, outside the control of the ALT	2	1	2
	Workforce performance review	Incorporation of Objectives, Values & Principles individual within biannual performance reviews	1	1	1
	Workforce survey (engagement and safety focus)	Quarterly. ALT report to workforce on findings and actions.	1	1	1
	Personal growth opportunities	3 documented opportunities/month in AMT minutes	1	1	1
Schedule		Max Weighting	10%	Actual Score	10%
	Completion of Unit 1, 2, 3 & 4 works in accordance with Practical Completion criteria and issue Certificate of Practical Completion	By 30/06/2018 (subject to approved variations)	10	1	10
Teamwork		Max Weighting -	blish Date: 24/07/2017 10%	Actual Score	10%
	Alliance Management Team & Alliance Leadership Team	50/50 split of parties 1 meeting/month minimum	5	1	5
	Social	1 social event for whole workforce/quarter	2.5	1	2.5
	Team approach to Community Engagement & Regulatory interface	Value-add opportunities formally documented within AMT meeting minutes	2.5	1	2.5
Integrity		Max Weighting	5%	Actual Score	5%
	Compliance to Alliance Principles	Zero recorded disciplinary proceedings in breach the Alliance Principles. Either a ALT/AMT member removed from the committee	5	1	5
Risk Management		Max Weighting	5%	Actual Score	5%
	Project risks are identified, assessed, controlled and communicated.	PRAR reviewed and updated quarterly, and project plans modified and communicated.	5	1	5
Community		Max Weighting	10%	Actual Score	10%
	Local workforce (Includes current Alinta personnel and Alinta Sub-Contractors))	20% local labor (within 100km radius)	2.5	1	2.5
	Local supply (Includes current Alinta suppliers)	20% of external spend (within 100km radius)	2.5	1	2.5
	Compliance with the Dust Management Plan TARP	90% compliance	5	1	5

Figure 2 - Example of Project Key Performance Indicators

7.3 Environmental Management Plan

The Environmental Management Plan outlines the systems to be used for Environmental Management for the APS Ash Dam Rehabilitation Project.

This Environmental Management Plan (EMP) provides the environmental management framework for the project activities and outlines the proposed management measures taking into account the site-specific conditions. The plan addresses key identified potential environmental impacts associated with the project and takes into account legislative requirements, standards and procedures.

Supporting documents include:

- Work, Health & Safety Management Plan (WHSMP)
- Project Risk Assessment Register (PRAR)
- Environmental and Community Policy
- Alinta Energy Environment and Community Policy
- EPA Licence No. 13006
- Environmental Compliance Agreement (2000)
- Emergency Response Guide
- FP APS Closure and Post-closure Plan
- FP Dust Management Plan
- Fugitive Dust TARP

The Environmental Management Plan is included in Appendix G attached to this document.

7.4 Revegetation Management Plan

The Revegetation Management Plan provides the framework for the revegetation activities and outlines the proposed management measures taking into account the site-specific conditions. This plan has been completed to address key potential environmental impacts with consideration to the conservation, protection, enhancement and management of native vegetation on-site, and has been completed pursuant to relevant legislative requirements, standards and procedures.

The Revegetation Management Plan is attached to this document as Appendix A.

7.5 Quality Management Plan

The purpose of the Quality Management Plan (QMP) is to describe the manner that Quality risks are identified and managed during the Ash Dam Rehabilitation Project. The QMP documents the necessary information required to effectively manage product quality from project planning to delivery. It defines a project' s quality policies, procedures, criteria for and areas of application, and roles, responsibilities and authorities.

The Quality Management Plan (QMP) will work in conjunction with the Work, Health & Safety Management Plan (WHSMP) and the Environmental Management Plan (EMP) to provide a project road map to assist in the successful completion of the Project on time and in budget.

Each distinct phase of work required for the successful rehabilitation of the Ash Dam have quality requirements as outlined in the QMP (Appendix H) and/or as summarised below.

7.5.1 Dust suppressant application

Quality management requirements for the application of dust suppressant is required to verify the correct application to ensure adequate suppression of fugitive dust emissions emanating from the Ash Dam.

Quality management requirements include:

- Technical advice received from Vital Chemical prior to application
- Review of aerial photographs, prior to, during and post application of the product.
- Accurate records of application and dilution rates of the dust suppressant.
- Inspection during and at the completion of the application by Vital Chemical supplier representative.
- Verification of the effectiveness of the application from the Vital Chemical supplier representative.
- A product performance guarantee has been included in Work Package 11, Ash Storage Area Agreement.

7.5.2 Civil works

The civil works will be undertaken in accordance with the requirements outlined in the Greenhill Engineers *Stormwater Drainage Design Calculations, Port Augusta Ash Dam Rehabilitation* dated 1 December 2016.

The growing medium obtained from the adjacent borrow pit will be emplaced across the Ash Dam at a minimum thickness of 150 mm. The minimum thickness of 150 mm will be verified through the completion of a survey following completion of the works.

The Stormwater Management is attached to this document as Appendix D.

7.5.3 Revegetation

The revegetation of the Ash Dam will be undertaken in accordance with the quality requirements outlined in the Revegetation Management Plan (Appendix A). Quality requirements for the revegetation of the Ash Dam and borrow pit are outlined in the Revegetation Management Plan. As a compliance measure, the Revegetation Management Plan is required to be approved by the Native Vegetation Council as a condition of consent to undertake native vegetation clearance and associated civil works within the borrow pit area. The Native Vegetation Clearance has since been approved, thus allowing works to proceed.

Select, collect and test seed

Plant Stock

The scope of the work is defined by six phases:

Phase 1: Locate suitable sites for collection of seed from native grass, chenopod and herb species.

Phase 2: Collect seedlot of mixed native species.

Phase 3: Dry and clean the seed collected.

Phase 4: Mulch the grass species.

Phase 5: Bag the seed for storage and delivery.

Phase 6: Provide a statement of the quantity (counts for each species) of viable seed being sown onto the site. This will be achieved through seed testing by a seed biologist (Swainsona Environmental Services). Each batch (species) of seed will be tested to determine seed count, purity, viability and basic germination. This method does not provide a guarantee of germination success or longevity of germinants as this is influenced by factors outside of our control (weather). However, it does provide a guarantee that the Alliance will have a measured quantity of viable seed to sow into the site.

Selection of Seed

Based on the designed approach of establishing and managing a vegetation community that is resilient, cost efficient and requires minimal management, the site will be dominated by coloniser plant species, providing the basis for Primary Succession to occur. The first step in the proposed Primary Succession process is to introduce a coloniser species as a 'catalyst' to establish a natural ecosystem for the barren Ash Dam and borrow pit, reducing weed management requirements, improving soil health and increasing invertebrate and vertebrate activity.

Seeds were selected, with preference to Indigenous species, based on:

A number of factors were considered when selecting the seed list for this project:

- The species exists locally

- The species can establish in low rainfall conditions (<250 mm rainfall)
- The species can tolerate saline and alkaline soils
- The species can tolerate poor quality soils
- Coloniser species that have the potential for multiple seed sets within the first 12 months (weather permitting)
- The species fulfils a successional role in the re-establishment of ecosystem function
- The seed is cost effective to harvest
- Access to sites with suitable stands of plants to provide the quantity of seed to be harvested without removing too much seed from any given site

Accordingly, a selection of South Australian native species inclusive of a mixture of grasses (*Poaceae*), *Chenopod*, and herb species have been selected.

Succession Ecology were engaged to for seed selection and collection, further engaging Swainsona Environmental Services for seed testing.

Seed Collection

Species native to the site were first preference, however, due to low counts of particular species, not all seeds were able to be collected from or nearby the APS site. Where seeds were unavailable from the APS site, they were collected from areas within South Australia, with an annual rainfall below 250 mm, deemed suitable for the proposed revegetation of the site.

Seed Testing

A suitably qualified seed biologist will undertake seed tests (as summarised in Phase 6) to determine seed count, purity, viability and basic germination of the collected seedlot. Each species will be tested individually, using the following methods:

- **Viability test**
    - A viability test (cut test) is conducted by dissecting seeds or dispersal units (such as fruit, bracts and florets) under a stereo microscope and used to assess seed fill

and the health of the embryo/endosperm. In conjunction with the seed count and purity test, the viability test is used to determine the number of viable seeds per kilogram and weight of 1000 viable seeds.

- **Basic germination test**
    - A basic germination test (no treatment) is used to determine if seeds are non-dormant and can germinate readily. It is conducted by planting seeds or dispersal units on a medium of 1% water agar and placing these in a germination cabinet (simulating the diurnal temperature and light settings of the bio-geographical region to be planted) for 4-6 weeks. At the end of the germination test any non-germinated seed or dispersal units are dissected to determine if they were capable of germination (contained healthy endosperm).
- **Seed count and Purity test**
    - A seed count and purity test is conducted by weighing seeds or dispersal units (such as fruit, bracts and florets) and impurities (e.g. plant matter) using a high precision balance (1/1000th gram). It is used to determine the number of seeds per kilogram (including impurities), weight (g) of 1000 seeds and purity (weight of pure seed versus impurities present).

On completion of testing, the seed will be mixed with vermiculite and bagged in bulker bags or wool bails. Once delivered to site, the seed will be stored in a dry, enclosed area to prevent seed damage and reduce the likelihood of pest infestation.

The seedlot will be inspected on a regular basis to ensure that the seed has not been detrimentally effected. If upon inspection the seed has been disturbed in anyway which may affect germinability, measures will be taken to further mitigate risks.

Direct Seeding

The planting design will aim to replicate the vegetation communities that occur naturally in this low lying coastal area, with surrounding communities dominated by *Atriplex* spp., *Maireana* spp. and *Acacia* spp.

The seedlot used will be a mixture of all species as listed in the Revegetation Management Plan (Appendix A). The seedlot will be seeded by one of the two following methods:

- **Hand Broadcasting**

  The seed, mixed with a carrying substrate (vermiculite) will be thrown by hand onto the site. A team of people will be engaged to hand sow the seedlot across the 273 ha Ash Dam Storage Area and 30 ha borrow pit site. The work group will consist of four teams of five people, and one person providing troubleshooting and logistical support.

  OR

- **Mechanical Broadcasting**

  The seed, mixed with a carrying substrate (vermiculite), will be broadcast through a mechanical seeder (air seeder, belt spreader, pendulum spreader, drill/combine seeder or super spreader),.

Both of these methods emulate the natural arrangement of the native vegetation community. This method of sowing as a 'mixed' seedlot allows for competition to occur, leaving only the strongest plants to survive.

Refer to the Revegetation Management Plan for further detail on the revegetation method.

7.6 Stormwater Management

An investigation was undertaken by Greenhill Engineers, to determine the effects of the stormwater from the proposed revegetation works during the major storm events, being the 100 year ARI (average recurrence interval).

The expected peak site runoff flow from the completed vegetated site during the 1, 10 and 100-Year storm events are detailed in Table 2. Flows during a 1 in 100-Year storm event have been confirmed to be contained within the site with no excessive velocity expected that would cause damage or inundation.

Table 2 - Peak site runoff flow

Storm event (ARI: Year)	Peak runoff flows (Hospital Creek) (m^3/s)
1	0.0

10	0.0
100	0.053

The current profile and infrastructure of the Ash Dam once revegetated has been deemed to provide sufficient measures to prevent further sediment and erosion issues. The contours of the Ash Dam have been designed to cater for peak runoff flows of 0.053 m^3/s, allowing for runoff from the Ash Dam to discharge into Hospital Creek, without detaining significant amounts of water.

No provision for detention is proposed or deemed necessary.

The Stormwater Management is included as Appendix D.

The modelling undertaken by Greenhill Engineers has been reviewed by of Tonkin Engineering. is a highly experienced and well recognised professional in this field. All comments and feedback provided by were incorporated into the model by Greenhill Engineers.

7.7 Aboriginal Heritage

The Aboriginal cultural heritage desktop risk assessment provides a comprehensive cultural heritage review, inclusive of archaeological, anthropological and a historical background study of the borrow pit area. Results and findings of this review assisted in assessing the risk areas within the borrow pit area.

Procedures have been developed in the event that Aboriginal cultural heritage is discovered during works. All personnel working on this project will be briefed in the site induction, and be made aware of risk areas, how to identify heritage and the measures put in place upon a finding.

The Aboriginal cultural heritage desktop risk assessment has been included in Appendix I Aboriginal Heritage Plan.

8. Contingency Plans

The purpose of the contingency plans is to ensure that appropriate measures are taken to manage risk associated with the rehabilitation of the Ash Dam, including fugitive dust emissions in the short term during the construction phase and establishment of native vegetation at the Ash Dam for the long-term management of dust.

The Site Supervisor shall ensure that the requirements of this plan are implemented.

8.1 Fugitive Dust

Refer to the Fugitive Dust TARP, appended to the Environmental Management Plan, for contingent measures in suppressing fugitive dust emissions. The Ash Storage Area Extreme Weather Monitoring Response Plan outlines the procedure for monitoring weather conditions and responding to severe weather events to manage the risk of fugitive dust emissions following such events.

8.2 Polishing Pond Sealing

Sealing of the Polishing Pond is essential in achieving long-term dust management of the Ash Dam. Currently the Polishing Pond is again inundated with water from recent rain events, resulting in the Polishing Pond being untrafficable. The area will continue to be monitored throughout the 2017/18 summer period and infill works will commence immediately when conditions are safe and trafficble. Construction methods will also be further assessed.

Should the area remain untrafficble and unsafe to conduct works, the following contingency will be considered to ensure the establishment of native vegetation communities.

Table 3 - Contingency for Polishing Pond Sealing

Contingency	**Action**
Contingency 1:	Should the Polishing Pond remain untrafficable due to its moisture content and structural stability, alternative options will be considered. One contingency method currently being investigated further is the aerial application of a hydromulch,

	seed, fertiliser and dust suppressant mix (or combintations thereof) to facilitate the establishment of a native vegetation community.

8.3 Revegetation

The establishment of native vegetation communities at the Ash Dam as a long-term dust management measure is essential to the successful completion of the rehabilitation project.

The following contingencies will be applied to enhance the establishment of native vegetation as required.

Table 4 – Contingency for revegetation

Contingency	**Action**
Contingency 1:	Should the results of the revegetation not be to a standard expected by the ecologist (consultant) based on an inspection, the ecologist shall be approached to provide professional advice which shall include a summary of the reasons for the failure of the establishment of the revegetation and recommendations to ensure the establishment of the vegetation communities.
Contingency 2:	An additional application of nutrients to encourage plant growth and seed germination shall be undertaken if establishment of plant communities is deemed to be unacceptable.
Contingency 3:	If it is found upon further inspection that there are areas of poor germination, additional seed will be hand sown, of the same or similar species.

Contingency 4:	An assessment shall be undertaken to determine if irrigation is required in selected areas to facilitate the establishment of the vegetation communities and if required, the optimal form of irrigation to implement will be considered.

8.4 Landform Stability

During civil works, areas will be monitored and maintained using protection measures as outlined in the Environmental Management Plan. Post construction works, scouring and landform stability will be maintained by adhering to the design and enabling vegetation growth. Procedures for ongoing remedial works are outlined in the Post-Completion Monitoring and Maintenance Plan.

The site surface condition will be assessed following breaks, which include breaks following rostered time off and breaks following weather events such as rainfall events which result in a temporary closure of the site due to unsafe and unsuitable conditions. Furthermore the condition of the site will be assessed daily (week days) during the any potential demobilisation period of the project. It is noted that the demobilisation period of the Ash Dam Rehabilitation project will be subject to weather conditions and the proposed timing will be progressively updated to reflect site conditions.

Refer to Appendix K for the Post-completion Monitoring and Maintenance Plan.

8.5 Program Timing

A key risk of the program is to ensure the soil is emplaced, and seeded, by the end of July 2017. This is to ensure that seed has been sown with sufficient time to allow germination during winter/spring 2017, and to ensure significant soil trafficking does not occur throughout the typical high-wind months of August, September and October. It is anticipated that the entire 273 ha area will not be capped at this time. Therefore dust suppressant measures will apply to those areas not seeded by the end of the growing season in 2017.

Should delays to the program occur (eg through delays in Regulator approval, or due to a severe weather event), the following contingency measures will be considered and applied:

Table 5 - Contingency for Program Timing

Contingency	Action
Contingency 1. NOTE: This contingency was activated in May 2017 and has been considered within this latest edition of the Plan.	Should the soil not be emplaced by 31 July 2017 across the entire 272Ha area: a. Preference will be given to covering the southern end of the Ash Dam (high-risk area for dust generation) and the Polishing Pond (high-risk area for odour generation) if and where possible. b. The maximum possible surface area will be covered by that date. c. The areas covered will be seeded. Seeding may occur in several phases (eg areas covered first may be seeded earlier in the season). d. Areas that remain uncovered will be assessed for dust generation and a dust suppressant may be applied. The uncovered areas would be the northern end of the Ash Dam and the Former Ash Dam. These areas are accessible by water cart for water and dust suppressant application. e. Final soil spreading works will be completed when conditions are safe and trafficable. Conditions will be continually monitored for the northern end of the ash dam and the Polishing Pond over the summer 2017/18 period, and crews will be re-mobilised to complete works when conditions are safe and trafficable in those areas. Final seeding would occur in approximately April/May 2018 under this scenario. f. During any periods of demobilisation,

Contingency	Action
	Flinders Power staff will continue to conducted daily surface condition inspections and monitoring of Ash Dam. A contingency pool of operators will be maintained for emergency responses. A specific plan for the demobilisation period will be prepared in due course.
Contingency 2.	Should the soil be emplaced across the 273 ha site, however revegetation advisors suggest that it is outside the seeding window to complete the seeding works: a. Areas of soil that have not been seeded will be assessed for dust generation potential. A dust suppressant application may be applied, pending an assessment of whether self-crusting of the soil has occurred. b. Monitoring and ongoing maintenance will occur. c. Final seeding would occur in approximately May 2018 under this scenario.

8.6 Seed Availability

The project requires a large amount of seed. Succession Ecology are currently harvesting the seed, however due to an unusually wet and mild summer, seed set of the chenopods is delayed. While Succession Ecology are confident that sufficient seed will be collected in time for sowing, the following contingency is set out.

Table 6 - Contingency for Seed Availability

Contingency	Action

Contingency	Action
Contingency 1.	• Increase the work teams harvesting seed through Q1 and Q2 2017. • Consider purchasing additional seed supplies from alternate suppliers (eg Eyre Native Seeds) • Consider reducing the seed application rate (from 20 kg/ha to a lower application rate, pending technical advice)

Appendices

Appendix A –Revegetation Management Plan

Appendix B – Soil Analytical Reports

Appendix C –Environmental and Geotechnical Assessment

Appendix D – Stormwater Management

Appendix E – Construction Methodology Plan

Appendix F – Work, Health & Safety Management Plan

Appendix G – Environmental Management Plan

Appendix H – Quality Management Plan

Appendix I – Aboriginal Heritage Plan

Appendix J – Borrow Pit Survey

Appendix K – Post-Completion Monitoring and Maintenance Plan