

An aerial photograph of a coastal region, likely in Queensland, Australia, showing a large launch complex. The complex is situated on a peninsula or coastal strip, with various structures, roads, and cleared areas. The surrounding landscape is a mix of green fields and brownish terrain. The ocean is visible on the right side, with a clear blue gradient. The text 'SOUTHERN LAUNCH' is overlaid on the image, with a starburst graphic to its right.

SOUTHERN LAUNCH

Whalers Way Orbital Launch Complex

Operational Environmental Management Plan (OEMP)

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List of Acronyms

AMSA	Australian Maritime Safety Authority
CEMP	Construction Environmental Management Plan
CFS	South Australian Country Fire Service
DEW	South Australian Department of Environment and Water
DAWE	Commonwealth Department of Agriculture Water and Environment
DPC-AAR	South Australian Dept of Premier & Cabinet - Aboriginal Affairs & Reconciliation
DPTI	South Australian Dept of Planning Transport and Infrastructure
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
HMP	Heritage Management Plan
MNES	Matters of National Environmental Significance
NVC	South Australian Native Vegetation Council
PIRSA	South Australian Dept of Primary Industries and Regions
SAAS	South Australian Ambulance Service
SAPOL	South Australian Police
SEB	Significant Environmental Benefit
SEDMP	Soil Erosion and Drainage Management Plan
WWOLC	Whalers Way Orbital Launch Complex

1. INTRODUCTION

SOUTHERN LAUNCH proposes to establish and operate the Whalers Way Orbital Launch Complex using an environmental management framework (EMF) that is consistent with Australian Standards (i.e. AS/NZS ISO 14001:2015 Environmental Management Systems).

Southern Launch has developed a strategy to manage potential environmental impacts during the operation of the Whalers Way Orbital Launch Complex (WWOLC). This strategy will be fully defined and developed during the design process, prior to operations being commenced. Operational activities at the Whalers Way site will ultimately be managed through the development and implementation of Environmental Management Plans (EMP) incorporating all relevant operational activities.

The overall goal of this Draft Operational Environmental Management Plan (OEMP) is to avoid, mitigate, manage and/or control any potential adverse impacts of the operational activities on the WWOLC on the biological, physical, social or economic environment. The OEMP would also give effect to any approval conditions imposed, and all commitments made by Southern Launch.

This Draft OEMP has been prepared for the purpose of the supporting the Environmental Impact Statement as part of the assessment of the application for the facility as a major development pursuant to Section 46 of the Development Act, 1993. This plan will ultimately be reviewed and updated during detailed design as a final CEMP prior to construction commencing.

1. Site Location

The subject land site is located at the southern tip of the Eyre Peninsula in South Australia. The site is approximately 25 km south of Port Lincoln in the area named Sleaford and is commonly known as “Whalers Way”. (Figure 1).

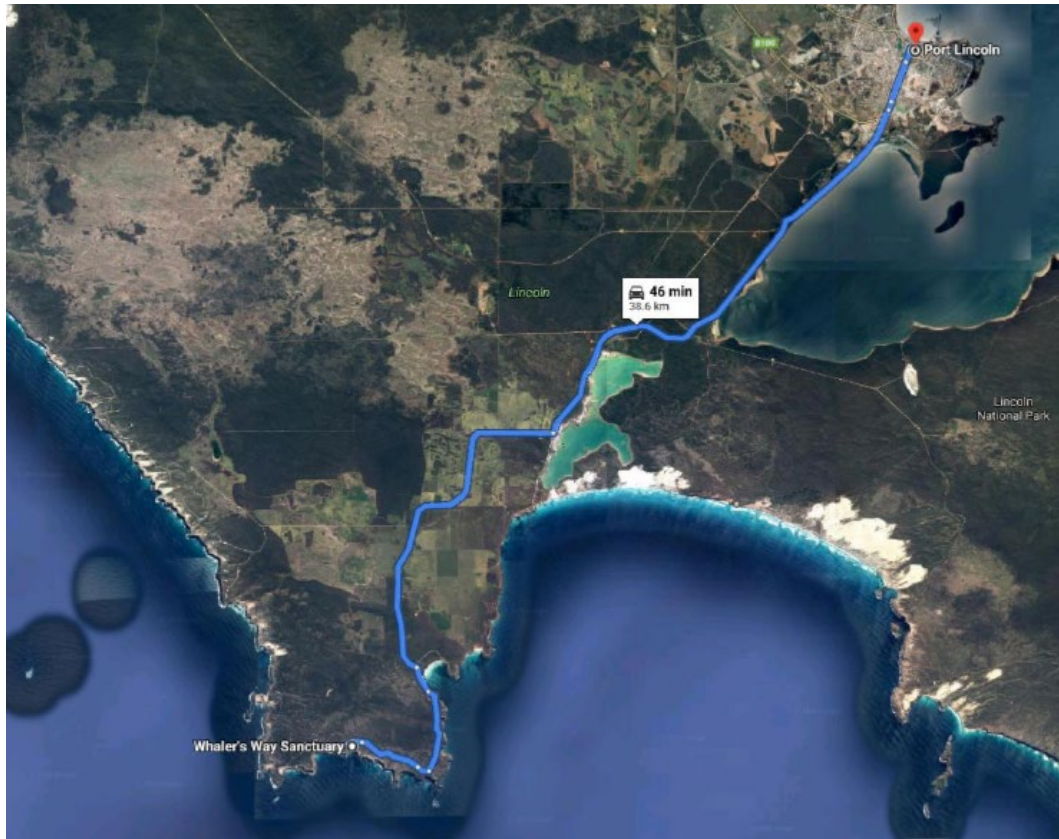


Figure 1 – Port Lincoln to Whalers Way

2. Facility Operations

Southern Launch is constructing a launch facility which will efficiently and safely cater for a broad range of clients with launch vehicles ranging from less than 1 tonne to approximately 120 tonnes. Fuel types catered for include solid, hybrid and liquid.

- The total site area is 2640 hectares.
- Southern Launch will be developing the following infrastructure on the site,

SITE	AREA (incl 10m Buffer Zone) sqm	DESCRIPTION
Launch Site A	55,300	Rocket Launch Facility designed to cater to orbital vehicles between 30 tonne and 120 tonne mass. Facilities include launch pad, flame trench, water deluge, fuel/oxidiser facilities, assembly building and utilities.
Launch Site B	54,950	Rocket Launch Facility designed to cater to orbital and sub orbital vehicles between 20 kg and 60 tonne mass. Facilities include launch pad, flame trench, water deluge, fuel/oxidiser facilities, assembly building and utilities.
Workshop Area	62,000	Workshop/Warehouse for site general maintenance. Main water storage dam (30 ML). Potentially could be a site for future power generation and or storage.
Range Control	9,300	Control room and facility for rocket launches. Conventional single level office building.

1. Infrastructure Components

a) Components of the Launch Facilities (Sites A and B)

- Assembly building – 48m long x 24m wide industrial shed with 8m (H) eaves.
- Runway – 200m long, asphalt construction.
- Launch Pad
- Flame Trench
- Flame Diverter
- Water Deluge System
- Fuel and Oxidiser Storage and Delivery
- Flare stack pipework and tanks.
- Lidar System.
- Utilities
- Security Fencing
- Landscaped areas

b) Components of Workshop Area

- Workshop/warehouse – 15m long x 10 wide
- Main water storage (30 ML dam)
- Utilities
- Vehicle Parking Areas

- Explosives Storage Pad
- Potential for Power Generation or Storage Facilities in the Future

c) Components of the Range Control Area

- Range Control Building – Conventional single level office building 25m long by 12 m wide.
- Roads and Parking
- Utilities
- Lighting
- Fire Fighting
- Landscaped Areas

2. Application of the OEMP to Site Operations

- The OEMP will apply to all staff, clients, contractors and sub-contractors involved in operations at the facility.
- The OEMP and relevant plans will be included as a component of Southern Launch operational documentation.
- The OEMP would be finalised following approval being granted for the facility. Comments and submissions from the public and agencies may be incorporated into the OEMP.
- It is anticipated that conditions of any approval would require the final OEMP to be submitted to the relevant government agencies for further approval before construction activities commence.
- The practical implementation of the OEMP is structured around environmental aspects and key operational activities that have a potential risk for environmental impact. The implementation of the management controls to lower risks to acceptable levels is therefore required.

3. Short Description of Operations

The operations of the WWOLC include the following activities

a) Launch Activities

- The launch vehicle is transported onto site by road transport and unloaded by crane in the assembly building. The vehicle will normally be unfuelled and in segments.
- The components are assembled in the assembly building.
- Payload components are delivered by road transport and unloaded in the assembly building.
- Final payload assembly is completed in the assembly building.
- Payload is inserted into the launch vehicle.
- Final assembly of the launch vehicle is completed in the assembly building.
- Launch vehicle is lifted onto trailer or trolley.
- Launch vehicle is moved along runway to launch pad.
- Launch vehicle is lifted into launch position by hydraulic lift or crane.
- Electrical, comms, fuel and oxidiser connections are fitted.
- Fuelling and oxidising operations undertaken.
- Launch Vehicle lift off
- Tracking of launch vehicle
- Management of trajectory

- Management of payload deployment

b) Non Launch Activities

- Delivery and storage of fuels/oxidisers. Includes storage tanks, pumps, cryogenics equipment and pipework.
- Delivery and storage of other gases or liquids (eg Helium, hydrogen).
- Maintenance and operation of diesel generator sets including diesel tanks and associated spill bunding
- Maintenance and operation of potable water systems
- Maintenance and operation of septic system.
- Maintenance and operation of stormwater management system including detention basin.
- Maintenance and operation of road networks.
- Maintenance and operation of street lighting networks.
- Maintenance and operation of security and fencing.
- Maintenance and operation of feral animal/plant management system.¹
- Maintenance and operation of irrigation systems.
- Maintenance and operation of water deluge systems.
- Maintenance and operation of pumps.
- General office works
- Equipment wash area
- Spare parts materials handling. Delivery, storage, retrieval and use.

WWOLC

3. Roles and Responsibilities

All personnel involved in the project including Southern Launch employees, contractors and sub-contractors, are required to work in accordance with this OEMP, and in accordance with all relevant Acts, Policies and Regulations.

Table 1 - Roles and Responsibilities outlines the roles and responsibilities for the implementation of the OEMP. Throughout detailed planning and construction phases, names would be allocated to the roles prescribed in the OEMP.

Table 1 - Roles and Responsibilities

Role	Responsibility
Southern Launch Board of Directors and CEO	Responsible for implementing requirements set for the development in legislation, regulation, codes of practice, and industry standards and implementing its environmental policy to minimise impacts and demonstrate commitment to sustainable practices.
	Ultimately responsible for compliance.
Southern Launch - Whalers Way Site General Manager	Promoting the culture of environment protection and providing clear expectations and guidelines.
	Overseeing the involvement of all internal and external stakeholders and addressing issues raised.
	Supporting the Project Manager in resourcing project teams.
	Ensuring resources are provided to implement the EMF.
	Intervening, if required, to ensure any deviation from EMF requirements is corrected.
	Reporting to the Southern Launch Board.
Southern Launch - Whalers Way Site Project Manager	Ensuring that OEMP requirements are communicated to all relevant contractors and consultants involved in construction at Whalers Way.
	Overseeing the development and implementation of the OEMP.
	Ensuring that sufficient funds are available to implement the OEMP.
	Ensuring that all environmental management requirements in the OEMP are understood.
	Ensuring that environmental management requirements are clearly communicated to all relevant contractors via appropriate inductions.
	Providing contractors with written instructions/protocols/methods regarding environmental management requirements.
	Monitoring performance and report on progress against OEMP objectives
	Intervening, if required, to ensure any deviation from OEMP requirements is corrected.
Reviewing and updating the OEMP as required.	

Role	Responsibility
Southern Launch - Whalers Way Site and/or Operations Managers	Ensuring that all environmental management requirements in the OEMP are clearly communicated to all relevant contractors via appropriate inductions.
	Providing contractors and clients with written instructions/protocols/methods regarding environmental management requirements and responsibilities.
	Ensuring all necessary environmental approvals and licences are secured before operations commence.
	Ensuring and monitoring compliance of construction activities with conditions of relevant licences, permits and the OEMP.
	Liaising with EPA and other regulatory authorities as required.
	Intervening, if required, to ensure any deviation from OEMP requirements is corrected.
	Notifying any legislative breaches or environmental incidents to authorities.
	Responding to any complaints received.
Southern Launch - Whalers Way Contractors & Clients	All contractors must take their environmental responsibilities seriously and diligently following all environmental procedures communicated to them by their supervisors.
	Undertaking all required inductions and/or environmental awareness training before starting work on site.
	Clients will be required to develop operational plans specific to their operations on site which are consistent with this site-wide OEMP.
	Reporting any environmental incidents to the WWOLC Manager immediately.
Southern Launch - Whalers Way Environmental Manager	Ensure the OEMP is implemented, and update documentation as required to reflect environmental legislation, design or operational changes.
	Coordinate monitoring programs and reporting to authorities.
	Manage environmental incidents and responses.
	Ensure SL environmental policy is reviewed annually.
	Manage environmental matters in relation to stakeholder engagement.
	Coordinate environmental awareness training and implement sustainability initiatives.

4. Training

All Whalers Way Orbital Launch Facility staff and contractors are required to undertake training in environmental management as part of their induction to the site and its activities before any construction activities could begin.

Induction training will address:

- Background to the Whalers Way Orbital Launch Complex project
- Approval conditions, and the role of the EMF
- Legislative requirements of the company, clients, contractors and individuals
- Key personnel and roles
- Whalers Way Orbital Launch Complex EMPs
- Environmental issues at the site and relevant management plans and procedures
- Community issues related to the project and relevant management plans and procedures
- Penalties for non-compliance with required plans and procedures
- Hazard and incident reporting and management procedure
- Emergency response plan.

Job-specific training would also be required. The Whalers Way Orbital Launch Complex Operational manager/s would be responsible for overseeing training, through the relevant functional (e.g. environment) and area managers.

5. Environmental Legislation, Regulations and Guidelines

The following environmental legislation, regulations and guidelines provide the regulatory framework around which the OEMP is based:

- Environment Protection Act 1993
- Environment Protection (Water Quality) Policy 2015
- Environment Protection (Air Quality) Policy 1994
- Environment Protection (Noise) Policy 2007
- National Environment Protection (Ambient Air Quality) Measure
- National Environment Protection (National Pollutant Inventory) Measure
- Guideline for Air Quality Impact Assessment Using Design Ground Level Pollutant Concentrations (EPA South Australia 2006)
- Guideline for the use of the Environment Protection (Noise) Policy (EPA South Australia 2007)
- Guidelines for the Assessment and Remediation of Groundwater Contamination (EPA South Australia, 2009)
- Space (Launches and Returns) Act 2018
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC & ARMCANZ 2000).
- Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention, 1972)
- 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (London Protocol)

Southern Launch will also ensure that its employees have relevant permits and that contractors provide copies of their permits and licences to Southern Launch. Contractors would also be required to be responsible for ensuring their staff had relevant permits and licences before they commence work on the development.

The OEMP would adhere to the conditions of these licences, ensuring that all onsite operations are compliant.

6. Environmental Aspects

The environmental aspects are defined as elements of an organisation's activities, products or services that could interact with the environment. A significant environmental aspect has, or could have, a significant environmental impact (AS/NZS ISO 14001:2015). The significant environmental aspects for the proposal were identified from the environmental assessment and are shown in Table 2 - Environmental Aspects.

Table 2 - Environmental Aspects

Environmental Aspect	Objective	Activity	Potential Impacts
Native Vegetation Clearance Native Vegetation Clearance Soil Disturbance Excavation Spread of Pest Plants and Animals	Minimise loss of abundance or diversity of native vegetation Minimise loss of native Fauna	Activities occurring outside of defined site footprints Road Maintenance Activities Vehicle Movements Incidents or contingencies impacting vegetated areas of the site.	Loss of approx 18.2 hectare of native vegetation (very poor to good condition) from the 2640 Ha site. Loss of fauna habitat Potential displacement of fauna Potential fauna fatalities resulting from vehicle movements
Biosecurity Introduction or spread of pest animals, plants or diseases.	Minimise the risks to the biosecurity status of the Whalers Way site. To minimise the risk of adverse impact on the biodiversity status of locations around the Whalers Way site.	Vehicle Movements Human movements	Introduction of pest species and/or diseases which could negatively impact on the ecosystem.

Environmental Aspect	Objective	Activity	Potential Impacts
Terrestrial Fauna Traffic Movements Noise Generation	Minimise impact on terrestrial fauna species No significant adverse impacts to listed threatened species (South Australia and Commonwealth) population in the development area	Launch Activities Vehicle movements	Potential impacts on native animals which inhabit the area such as kangaroos and emus. Potential impacts on ground dwelling birds such as the Emu Wren and Western Whipbird. Potential fatalities of terrestrial fauna from vehicle impacts
Generation of Waste and Discharges Stormwater runoff Waste generation Accidental release/spill of fuels or chemicals	Ensure the quality and quantity of discharged surface water and stormwater effected by site activities meets the required standards No adverse effects on water table quality No significant contamination of soils as a result of storage and/or use of fuels or chemicals Minimise the generation of waste Maximise reuse and recycling of waste	Launch Activities Onsite fuel storage and use Onsite chemical storage and use	Accidental release/spill of fuels and/or chemicals resulting in soil and/or water contamination Generation of waste requiring disposal Pollution which impacts of local flora and/or fauna

Environmental Aspect	Objective	Activity	Potential Impacts
	Ensure all waste is disposed of in accordance with all relevant legislation.		
Emissions from Plant and Equipment Noise and vibration generation Dust generation	No adverse public nuisance impact from noise/vibration or dust generation	Vehicle movements Launch activities	Potential temporary noise disturbance to neighbouring farms - this is considered highly unlikely due to the distance between the site of works and the neighbouring properties

Environmental Aspect	Objective	Activity	Potential Impacts
<p>Community Interaction Changes to Visual Amenity Light emissions Noise Emissions Socio economic values</p>	<p>Ensure the impacts to amenity are reduced to as low as possible</p> <p>No adverse public nuisance impact from noise or light emissions from the site</p> <p>To maintain or improve the existing social and economic values of the region</p>	<p>Launch Activities</p> <p>Vehicle movements</p>	<p>The launch sites are not visible from any point on land which is outside the Whalers Way site.</p> <p>The launch sites are a considerable distance from the site boundaries and it is highly unlikely that people off the site will detect light, noise or visual impacts</p> <p>The launch sites are generally not visible from the sea except for a few small areas. The impact is highly likely to be limited.</p>
<p>Marine Disturbance Water quality Impact on marine animals</p>	<p>No negative impact on sea water quality</p> <p>No significant adverse impacts to specified marine environmental values of Whalers Way and Liguanea Island</p>	<p>Launch activities</p>	<p>Noise impacts on marine birds or seals on Liguanea Island - considered to be highly unlikely due to location of launch activities</p> <p>Pollution of sea water from launch activities - considered highly unlikely due to location of those activities</p>

7. Terrestrial Fauna

The operation of the Whalers Way Orbital Launch Complex will result in risks to terrestrial fauna around the area of works. The aspects of the operations related to interaction with terrestrial fauna include:

- traffic movements
- noise generation.
- Generation of waste which attracts feral predators

Potential impacts associated with these aspects include:

- Impacts on native animals that potentially inhabit the site
- Disturbance of native fauna during launch
- Road kills of native fauna
- Increase in feral predators resulting in increase kills of native animals

1. Legal and Other Guidance

- Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)
- MNES Significant Impact Guidelines
- National Parks and Wildlife Act 1972
- Environment Protection (Noise) Policy 2007
- Guideline for the use of the Environment Protection (Noise) Policy (EPA South Australia 2007).

2. Values

The environmental values to be protected include:

- Terrestrial ecosystems
- Terrestrial fauna, particularly the Western Whipbird and the Emu Wren.

3. Objectives

- To minimise the disturbance to terrestrial fauna.
- To minimise adverse impacts to listed threatened species (South Australia and Commonwealth) populations in the development area.

4. Environmental Management Measures

The management measures to be implemented during operational activities are provided in Table 3 - Terrestrial Fauna Management. Stand-alone management plans and/or procedures would be developed prior to the commencement of operations to address specific activities that may result in interaction with terrestrial fauna. These include:

- Native Vegetation Management Plan
- Flora and Fauna Management Plan
- Waste management plan

Table 3 - Terrestrial Fauna Management

Management Item	Responsibility	Management Measure
Terrestrial Ecosystems	WWOLC Manager	Measures implemented to reduce risk of native animals being killed by vehicle, including Warning signs to alert drivers of the presence of native animals Reduced on site speed limit Induction process to highlight the risk
		Design and operational measures to minimise the potential impacts
		Feral animal control program to be implemented
		Waste minimised and controlled to avoid attracting predators and scavengers
Matter of National Environmental Significance	WWOLC Manger	Vehicle strike data will be reviewed to determine any trends to assist in continuous improvement
	Clients	Inductions will include information so staff, contractors and visitors can identify significant species
	Contractors	Feral cat sightings will be reported via the Feral Cat Scan app
		Southern Launch will support either Adelaide University and/or University of South Australia to conduct post graduate studies (masters or PhD) on the Western Whipbird and Emu Wren to lead to greater understanding of the species and to understand what, if any, Southern Launches operations have on these species.

Noise, Vibration and Lighting	WWOLC Manager	Truck movements on local roads would be limited as much as practicable and vehicles with larger load capacity chosen where possible to reduce the number of vehicle movements
	Clients	Truck movements on site roads will be restricted to a low speed limit - 40km/h on site roads and 10 km/h on work sites
	Contractors	Equipment which is used intermittently will be shut down or throttled down to a minimum when not in use Equipment will be well maintained and have mufflers/silencers installed to meet the manufacturers specifications where relevant Metal to metal contact will be avoided where feasible
		Staff instructed not to drop material from a height unless dropping on to a surface (eg loose soil) which will dampen the noise The area of operations is not visible from off site (landside) so visual impact is not a factor The area of operations is not visible from off site (landside) so lighting impact is not a factor. Operations will be kept to daylight hours as much as is practicable.

5. Assessment Criteria and Monitoring

Assessment Criteria	Monitoring
No preventable death or serious injury to Western Whipbirds or Emu Wrens during operations	<p>Inspection of the operational area prior to commencement of launch activities for Western Whipbird and Emu Wren individuals and nesting sites.</p> <p>Visual inspections of immediate surrounding area</p> <p>Use of gas guns or other noise generating equipment to remove birds from any high risk zones.</p>
No preventable death or serious injury to any native animal species during the operations	Speed limits on vehicles operating on site to reduce risk
No increase in attractors for predatory feral animals such as cats and foxes	<p>Regular inspection of road network for dead animals</p> <p>Staff to report any dead animals</p> <p>Dead animals to be removed.</p> <p>Waste management plan to be implemented to ensure no waste to attract predatory feral animals</p>

6. Reporting

- Fauna encountered during pre-clearance checks to be reported to WWOLC Manager.
- Any fauna deaths that appear to be the direct result of operations activities to be reported to the WWOLC Manager immediately.
- Compliance reporting would be undertaken in accordance with relevant licences/permits issued by government regulators.
- Staff and contractors to report any sightings of dead animals to the WWOL Facility Manager immediately.

7. Non-conformance

- Unusual fauna injury/deaths to be investigated and appropriate corrective action undertaken.
- Non-conformances would be reported to the WWOL Facility Manager immediately and appropriate corrective action undertaken.

8. Key Government Departments

- Attorney General’s Department – Planning and Land Use Services
- Department for Environment and Water (DEW)
- Commonwealth Department of Agriculture, Environment and Water (DAWE)

8. Community Interaction

The operation of the Whalers Way Orbital Launch Complex will impact the Whalers Way community in a variety of ways. The aspects of the development related to community interaction include:

- Dust emissions, noise, vibration and lighting during operation of the facility
- Effects on the local, state and national economy,
- Effects on utilities
- Effects on the community.

Potential impacts associated with these aspects include:

- Potential temporary disturbance to neighbouring landholders from noise. This impact is likely to be very low or non-existent as the site of works for Sites A, B and the warehouse sites to the nearest neighbour ranges from 3.0 km to 4.8 km. There is a significant hill between these sites and the neighbour to additionally reduce noise.
- Effects from light disturbance are not expected as the neighbours cannot see the launch sites.
- Significant effects on visual amenity are not expected as the neighbours cannot will have limited visibility of launch site infrastructure

1. Legal and other guidance

- Environment Protection Act 1993
- Environment Protection (Air Quality) Policy 1994
- Environment Protection (Noise) Policy 2007
- National Environment Protection (Ambient Air Quality) Measure
- AS4282-1997: Control of the obtrusive effects of outdoor lighting

2. Values

The environmental values to be protected include:

- Social amenity
- Visual amenity
- Local economy.

3. Objectives

- To ensure that impacts to amenity are reduced to as low as reasonably practicable
- Minimal adverse public nuisance impact from dust, noise or light emissions from the site
- To maintain or improve the existing social and economic values of the region.

4. Environmental Management Measures

The management measures to be implemented during operations are provided in Table 4 - Community Interaction Management. Stand-alone management plans and/or procedures will be developed, as required, prior to the commencement of operations to address specific activities that may result in community interaction. These include:

- Environment Management Plans
- Bushfire Hazard Management Plan
- Heritage Management Plan
- Air Quality Management Plan
- Water Quality Management Plan
- Noise Management Plan

Due to the unique nature of the operations, Southern Launch will be undertaking ongoing noise monitoring and assessment, during initial stages of the activity, to ensure the operations do not have a significant negative effect on our neighbours.

Table 4 - Community Interaction Management

Management Item	Responsibility	Management Measure
Traffic and Transportation	WWOLC Manager	Truck movements on local roads would be limited as much as practicable and vehicles with larger load capacity chosen where possible to reduce the number of vehicle movements
		The vast majority of traffic movements generated by the operational phase will not leave the site, will not be visible from off site and cannot be heard from offsite. As a result, traffic and transportation should have minimal impact on the surrounding community
		Tourism traffic will need to be restricted or eliminated during operations due to the high risk associated with members of the general public driving around an operational rocket launch facility
Public Safety	WWOLC Manager	All reasonable precautions would be taken throughout operations to prevent bushfires resulting from human activity associated with the project
	Clients	Consider emergency response requirements (as per the bushfire management plan) to acknowledge the predicted increase in the number of severe fire danger days and the exposure of the workforce to work induced heat stress.
	Contractors	Tourism traffic will need to be restricted or eliminated during operations due to the high risk associated with members of the general public driving in a rocket launch facility
		The cliffs around the site are high and generally undercut. There is a significant risk of cliff edges collapsing. Staff and contractors will not approach the edge of the cliffs and we will undertake to restrict the general public from doing so.
Agriculture	WWOLC Manager	Application of measures to manage operational activities consistent with standard industry practice in Southern Australia to ensure minimal impact on our neighbours during those activities.
		Stormwater management, compacting storage/laydown/parking areas will reduce risk of negative impacts on our neighbours

Management Item	Responsibility	Management Measure
		Management strategies will be implemented to limit dust generation Dust suppression systems, including water damping, will be used to minimise dust generation particularly around roads and access tracks

5. Assessment Criteria and Monitoring

Assessment Criteria	Monitoring
<p>Respond proactively to issues or complaints raised by the adjacent landowners, stakeholders and the community</p> <p>Ensure there is a defined notification process to ensure neighbours, stakeholders and general community understand when high noise level events will occur.</p> <p>Have a defined liaison process with neighbours, stakeholders and the general community</p>	<p>Review of adherence to processes and timeframes in Complaints Management Procedure/Stakeholder Engagement Plan.</p>

6. Reporting

- Record and respond to complaints in accordance with the Complaints Management Procedure/Community Engagement Plan.
- Record notification/liason interactions with neighbours, stakeholders and general community.
- Compliance reporting would be undertaken in accordance with relevant licences/permits issued by government regulators.

7. Non-conformance

Non-conformances would be reported to the WWOL Facility Manager and appropriate corrective action undertaken.

8. Key Government Departments

- Attorney General’s Department – Planning and Land Use Services
- Environment Protection Authority (EPA)
- District Council of Lower Eyre Peninsula
- Department of Environment and Water (DEW)
- South Australia Police (SAPOL)
- South Australian Ambulance Service (SAAS)
- South Australian Country Fire Service (CFS)

9. Generation of Waste and Discharges

Activities associated with the operation of Whalers Way Orbital Launch Complex will result in the generation of wastes and discharges, which must be managed appropriately. The aspects of the development related to the generation of wastes and discharges include:

- Stormwater runoff
- Waste generation
- Accidental release/spill of chemicals/fuels/diesel

Potential impacts associated with these aspects include:

- Erosion/pollution due to stormwater runoff
- Generation of wastes requiring disposal
- Accidental release/spill of chemicals/fuels/diesel resulting in soil contamination
- Biosecurity associated with operations activities
- Marine pollution and effects on marine communities.

1. Legal and Other Guidance

- Environment Protection Act 1993
- Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)
- Dangerous Substances Act 1979 (SA)
- Biosecurity Act 2015
- Fisheries Management Act 2007
- Environment Protection (Water Quality) Policy 2015

2. Values

The environmental values to be protected include:

- Terrestrial ecosystems
- Local economy
- Soil quality
- Underground water quality
- Marine water quality
- Marine ecosystems

3. Objectives

- No introduction of terrestrial or marine pests
- To ensure that the quality and quantity of discharged surface water and stormwater affected by site activities meets required standards and objectives
- No adverse effects on marine water quality
- To minimise the generation of general wastes, maximise their reuse and recycling and ensure safe and lawful disposal of waste
- No significant contamination of soils as a result of storage and/or use of hazardous materials.

- No significant contamination of underground water as a result of storage and/or use of hazardous materials.

4. Environmental Management Measures

The management measures to be implemented during operational activities are provided in Table 5 - Waste and Discharge Management. Stand-alone management plans and/or procedures would be developed prior to the commencement of construction to address specific activities that may result in the generation of wastes and discharges. These include:

- Stormwater Management Plan
- Operational Management Plan
- Biosecurity Management Plan and Response Procedure
- Waste Management and Minimisation Plan
- Water Quality Management Plan
- Emergency Response Management Plan
- Fuel and Chemical Storage and Handling Plan

Table 5 - Waste and Discharge Management

Management Item	Responsibility	Management Measure
Terrestrial Ecosystems	WWOLC Manager	Appropriate site layout and operational procedures will be adopted to prevent stormwater or silt to cause damage to the surrounding terrestrial environment.
Matters of National Environmental Significance	WWOLC Manager	Any marine spill or pollution incidents will be reported to the Australian Maritime Safety Authority (AMSA)
	Clients	Waste and rubbish will be minimised and managed so as to not attract predators such as foxes and feral cats.
	Contractors	Waste management practices will be monitored throughout operations
		All spill and pollution incidents (terrestrial or marine) and any trends in their occurrence will be monitored.
Groundwater and Surface Water	WWOLC Manager	During operations, a Soil Erosion and Drainage Management Plan (SEDMP) shall be implemented in accordance with the Environment Protection Act 1993.
	Clients	The minimisation of cleared land to minimise exposure to wind and rain.
		Site will be designed to contain and manage all stormwater runoff during operations in order to eliminate uncontrolled channelling and concentrated runoff streams. No site stormwater would discharge to surface water bodies in an untreated state.
	Contractors	The storage of all chemicals will be in compliance with the appropriate standards. Any spills will be contained and cleaned up. All spills will be reported to the relevant authority as required by law.
		Fuel and chemical storage will be bunded and will have an impermeable base.

5. Assessment Criteria and Monitoring

Assessment Criteria	Monitoring
No direct stormwater discharge from the operations site to the ocean or to any other surface water source.	Regular inspection of stormwater management system
Spills/accidental releases of fuel/chemicals are contained	Containment and clean-up of accidental spills will be monitored against Spill Response Plan.
All waste material to be appropriately classified and segregated for reuse, recycling or offsite disposal as per the Waste Management and Minimisation Plan.	Implement a regular inspection program to monitor storage handling and disposal of wastes as per the Waste Management and Minimisation Plan.

6. Reporting

Results of inspections would be documented any uncontrolled releases or spills reported. All waste disposed of off-site would be documented as per the Waste Management and Minimisation Plan. Compliance reporting would be undertaken in accordance with relevant licences/permits issued by government regulators.

7. Non-conformance

Non-conformances would be reported to the WWOL Facility Manager and appropriate corrective action undertaken.

8. Key Government Departments

- Environment Protection Authority (EPA)
- Department of Primary Industries and Regions, South Australia (PIRSA)
- Biosecurity SA
- Department for Environment and Water (DEW)
- Australian Maritime Safety Authority (AMSA)
- Commonwealth Department of Agriculture, Water and Environment (DAWE)

10. Emissions from Plant and Equipment

The employment of equipment used for the operation of the Whalers Way Orbital Launch Complex will result in the generation emissions including noise, vibration and dust. The aspects of the development related to emissions from plant and equipment include:

- Dust emissions, noise, vibration and lighting during the operation of the Whalers Way Orbital Launch Complex.

Potential impacts associated with the release of such emissions includes temporary disturbance to neighbouring farms (from noise and fugitive dust).

1. Legal and Other Guidance

- Environment Protection Act 1993
- Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)
- Environment Protection (Noise) Policy 2007
- Environment Protection (Air Quality) Policy 2016
- Environment Protection (Water Quality) Policy 2015
- National Environment Protection (Ambient Air Quality) Measure
- Guidelines for the use of the Environment Protection (Noise) Policy (EPA South Australia 2007)
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC & ARMCANZ 2000)
- Workplace Exposure Standards for Airborne Contaminants (Safe Work Australia 2013).

2. Values

The environmental values to be protected include:

- Social amenity
- Air quality
- Local economy

3. Objectives

- No significant adverse public nuisance impact from noise/vibration, lighting or dust generation from the site.

4. Environmental Management Measures

The management measures to be implemented during construction activities are provided in Table 6 - Emission Management. Stand-alone management plans and/or procedures would be developed prior to the commencement of construction to address specific activities that may result in emissions from plant and equipment. These include:

- Soil Erosion and Drainage Management Plan (SEDMP)
- Waste Management and Minimisation Plan
- Spill Response Plan
- Emergency Response Management Plan

Table 6 - Emission Management

Management Item	Responsibility	Management Measure
Noise	WWOL Facility Manager	Process and equipment which generate lower noise will be selected where ever feasible
		Noise plan, access roads and site compounds will be sited as far away from neighbouring properties as is practical
		Equipment which emits noise in a particular direction will be sited such that noise is directed away from neighbouring properties
		Acoustic enclosures or barriers will be installed around above ground equipment where noise levels are predicted to exceed the relevant noise level targets at neighbouring properties where ever safe and practical
		Noisier operational works would be scheduled with consideration to neighbours if the generated levels are likely to cause an inconvenience at the neighbouring property
		Induction will cover noise management and complaints. This will be reinforced through ongoing training
		Stakeholder communication will be undertaken, advising of noise generating activities or works if those activities are projected to affect the neighbouring property
		Truck movements on local roads would be limited as much as possible.
		Equipment will be well maintained and have mufflers and silencers installed that meet the manufacturers specifications where relevant.
		Metal to Metal contact to be avoided where possible
Vibration		Induction will cover vibration management and complaints. This will be reinforced through ongoing training

Management Item	Responsibility	Management Measure
	WWOL Facility Manager	Stakeholder communication will be undertaken, advising of vibration generating activities or works if those activities are projected to affect the neighbouring property
	Clients	Low vibration plant alternatives will be used where feasible.
	Contractors	
Lighting	WWOL Facility Manager	Lighting is expected to be a minimal issue as our neighbours cannot see our launch sites. Induction will cover lighting management and complaints. This will be reinforced through ongoing training Stakeholder communication will be undertaken, advising of light generating activities or works if those activities are projected to impact the neighbouring property
Air Quality	WWOL Facility Manager	Unpaved roads will be watered during periods of high traffic movement Vehicle speed in operational zones will be 10 km/h
	Contractors	Scheduling operational works where practical to avoid dry, windy weather conditions which could result in dust impacts on neighbouring properties

5. Assessment Criteria and Monitoring

Assessment Criteria	Monitoring
Investigation of air quality and/or noise complaints raised by the community indicates no exceedance of project air quality and/or noise criteria due to operational activities.	<p>Daily visual monitoring and observation of dust/noise and implementation of adaptive management strategies as required.</p> <p>Ongoing noise monitoring will be undertaken until a detailed understanding/confirmation of the noise impacts of launches is understood.</p>

6. Reporting

- Record and respond to complaints in accordance with the Complaints Management Procedure/Community Engagement Plan.
- Summary of monitoring results and any complaints received to be documented in monthly report.
- Compliance reporting would be undertaken in accordance with relevant licences/permits issued by government regulators.

7. Non-conformance

Should an exceedance of nominated criteria occur (identified through monitoring or investigation of a complaint) alteration of site practices should occur which may include but is not limited to ceasing work in windy conditions, increased operational controls (e.g. additional watering, reducing level of exposed areas, relocation of noisy equipment) or more rigorous monitoring/observation.

Non-conformances would be reported to the WWOL Facility Manager and appropriate corrective action undertaken.

8. Key Government Departments

- Attorney General’s Department – Planning and Land Use Services (AGD-PLUS)
- Department for Environment and Water (DEW).
- Environment Protection Authority (EPA).
- District Council of Lower Eyre Peninsula.
- Commonwealth Department of Agriculture, Water and Environment (DAWE).

11. Detailed Mitigation Strategy

Table 7 - Detailed Mitigation Strategy

Delivery Phase	Aspect	Proposed Mitigation Measures
Detailed design	Minimisation of impacts to ecology - flora and fauna values	<ul style="list-style-type: none"> • Portions of the Project are located within existing access tracks and wherever possible, have been aligned to be co-located with existing access tracks to limit the amount of native vegetation and fauna habitat to be cleared. Tracks will be formalised initially into gravel roads and upgraded to asphalt in the future, which will minimise the generation of dust and potential impacts to surrounding vegetation and fauna habitat.
		<ul style="list-style-type: none"> • The size of the Project Area has been reduced in size from 70.58 ha to 23.76 ha through design considerations, in particular the re-design of Infrastructure Site D to position the footprint into more degraded vegetation. Southern Launch will undertake detailed design and/or construction planning to minimise the construction footprint and avoid impacts to vegetation as far as practicable.
		<ul style="list-style-type: none"> • Disturbance footprints will be limited to those areas required to construct and operate the works, as practical for safety, especially in regard to the clearing of native vegetation.
		<ul style="list-style-type: none"> • As Detailed Design progresses it will define temporary and permanent storm water, erosion and sediment/pollution control measures in a Soil Erosion and Drainage Management Plan (SEDMP), that complies with regulatory requirements. Temporary and permanent measures will be appropriate to the site conditions, responding to environmental receptors, climatic zone and seasonal factors. The SEDMP will also establish and specify the monitoring and performance objectives for handover on completion of construction.
		<ul style="list-style-type: none"> • Fencing around the Launch Sites A and B, Infrastructure Site D and Range Control Site E as detailed in Section 2.1 and Section 7.1.10 will be incorporated into the design to minimise risk to fauna and channel fauna toward safe movement opportunities. A 1800 mm chain mesh fence with three strands of barbed wire will be installed to ensure threatened bird species can't fly through or get caught in the fencing.
		<ul style="list-style-type: none"> • Firebreaks incorporated along fences to protect and mitigate one of the primary threats to EPBC listed species present.
		<ul style="list-style-type: none"> • All buildings and facilities are sited within the Project Area to achieve suitable clearance from vegetation for fire mitigation purposes. The siting of all buildings and facilities within the Project Area footprint achieves the minimum fire clearance requirements under the National Construction Code • Assembly building, Fuel Pad and Oxidiser pad will have firefighting services as per legislation.
		<ul style="list-style-type: none"> • The Project will be designed to only support micro-lift and small-lift rocket vehicles not requiring the development of large infrastructure that may have a greater impact on the surrounding environment.
		<ul style="list-style-type: none"> • Where necessary and possible geo-barriers will be employed to limit the potential damage from a spill or leak of liquids.

Delivery Phase	Aspect	Proposed Mitigation Measures
		<ul style="list-style-type: none"> The proposed detention basins and dam will be lined with a polymer lining, a 1800 mm chain mesh fence with three strands of barbed wire will be installed around all the three open water bodies and they will be covered with a geotextile tarp or shade cloth to detract bird species, and keep pest species and native ground dwelling fauna species out of the open water bodies.
		<ul style="list-style-type: none"> The CEMP and OEMP will require the inclusion of any Commonwealth and State approval conditions stipulated for vegetation clearing with regards to fauna management. This may include a trapping program, presence of wildlife spotters onsite during clearing, and clearing being undertaken from disturbed areas toward undisturbed areas to encourage fauna to move away from the clearing operation.
		<ul style="list-style-type: none"> The CEMP and OEMP to be prepared for this Project will incorporate mitigations measures proposed in this table, and further progressed mitigation measures that are developed as the Project progresses through approval pathways.
	Weeds and pests	<ul style="list-style-type: none"> A Weeds and Pests Sub-plan will be developed as a component of the CEMP and OEMP in accordance with the Development Act, the NV Act and relevant LSA board recommendations. The Weeds and Pests Sub-plan will ensure weed control methods for threatened species will be done in accordance with the relevant Recovery Plan for the species (i.e. the Western Whipbird (eastern) National Recovery Plan).
	Water quality	<ul style="list-style-type: none"> Stormwater is to be captured on each launch pad site and no stormwater is to leave any site. Launch Site A, Launch Site B and Range Control Site E will have swales along the site boundaries. Infrastructure Site D has a large catchment area and it is planned to install a dam (possibly 30 ML) to supply the site's water needs. The dam would be the quarry site to supply engineered road materials.
		<ul style="list-style-type: none"> Initially, all water needs will be supplied by water trucked onto the individual sites and stored in 25,000L on site. Once the dam is constructed, water would be supplied in each site's stormwater detention basin from Infrastructure Site D via direct pumped mains. This water would then be used for deluge, fire and irrigation.
	Noise	<ul style="list-style-type: none"> A water deluge system and flame trench has been included in the design to mitigate noise impacts, which reduce the noise level by approximately 5-10dB.
Post construction - rehabilitation	<ul style="list-style-type: none"> A Rehabilitation Management Sub-plan will be developed for the Project, as a component of the CEMP and OEMP. As a minimum it will establish the following: <ul style="list-style-type: none"> - Location-specific objectives for rehabilitation of temporarily disturbed areas, reinstatement and/or stabilisation - Timeframes for rehabilitation and/or reinstatement/stabilisation works to be achieved - Details of the actions and responsibilities to progressively rehabilitate, regenerate, and/or revegetate areas, consistent with the agreed objectives - Include rehabilitation requirements such as: 	

Delivery Phase	Aspect	Proposed Mitigation Measures
		<ul style="list-style-type: none"> ▪ Tying and ripping of base and sub-base material; ▪ Application of soil ameliorants; ▪ Topsoiling and/or compost blanket; ▪ Stabilisation and rehabilitation (e.g. planting and or seeding). <ul style="list-style-type: none"> - Consideration for maintenance or performance issues of rehabilitation e.g. vegetation that does not grow and obscure signals or impact the longevity of rail infrastructure - Procedures, timeframes, measurable performance objectives and responsibilities for monitoring the success of rehabilitation and/or reinstatement/stabilisation areas - Where temporary construction facilities are required, land shall be returned to a stable condition that complies with the conditions of applicable regulatory approvals.
	Offsets	<ul style="list-style-type: none"> • Restriction of the Project Area as far as practical, to that required to safely and efficiently construct and operate the Project. In doing so, avoid areas of MNES, NPW Act listed receptors and their associated habitat, where possible, thereby minimising significant adverse residual impacts to these matters. • A biodiversity and native vegetation offset strategy will be developed in consultation with the NVC (SA) and the DAWE (Commonwealth), only if required.
Pre-construction/ Construction	Native vegetation and flora	<ul style="list-style-type: none"> • All contractors are to be briefed on clearing requirements and restrictions (including fines) to prevent over-clearing of these areas.
		<ul style="list-style-type: none"> • Clearing extents will be limited to the area of the permanent and temporary works, avoiding impacts to native vegetation and habitats as far as practicable.
		<ul style="list-style-type: none"> • Ensure all necessary permits and approvals are in place prior to the commencement of construction.
		<ul style="list-style-type: none"> • Topsoil stockpiles will be a maximum of 3 m in height to avoid heat sterilisation of the seed bank. Further information will be detailed in the SEDMP.
		<ul style="list-style-type: none"> • Topsoil stockpiles will be managed to maintain the viability of soil seed banks for flora species. Further information will be detailed in the SEDMP.
		<ul style="list-style-type: none"> • Use vegetation clearing methods that encourage natural regeneration of rootstock, minimise land disturbance and maintain soil stability.
		<ul style="list-style-type: none"> • Vegetation clearing to be undertaken in a sequential manner to allow fauna present sufficient time and space to move out of the area of their own accord, rather than being forcefully moved.

Delivery Phase	Aspect	Proposed Mitigation Measures
		<ul style="list-style-type: none"> • Apart from initial earthworks to construct access tracks and hardstand areas, ensure all vehicles and construction equipment always utilise dedicated access tracks and hardstands within the Project Area and do not travel outside of these areas. • Construct windrows (small soil berms) on the edge of access tracks and hardstands to delineate the boundary and prevent vehicles and construction equipment damaging vegetation beyond the construction impact zone. • Ensure all physical flora control measures, such as windrows, signage and exclusion barriers/bunting are checked and maintained on a regular basis (weekly as a minimum). • Where construction work (e.g. excavation) is required beneath the canopy of a tree, ensure that it is carried out carefully and by hand to avoid damage by equipment • This is to be guided by best practice and, where relevant, as per Tree Protection Zones detailed in <i>AS4970 2009 Protection of Trees on Development Sites</i>. • Cease work immediately in relevant areas if any previously unknown threatened flora species are encountered. • Display a fact sheet on threatened flora species on site notice boards and in lunchrooms. • Do not disturb the ground beneath the canopy of any tree that is not in the approved clearance footprint and ensure that vehicles, construction equipment, materials or waste are not located beneath the canopy of any tree.
	Fauna	<ul style="list-style-type: none"> • Scheduling of clearing activities will be done to avoid breeding seasons as far as reasonably practical. Where this is not practical, and where breeding sites are identified within the corridor during pre-clearance surveys, a suitably qualified person will provide mitigation measures for hazardous zones/ relocation requirements relevant to the specific species identified. • Any required fauna fencing will be installed in accordance with the fencing strategy which will be finalised and documented in the detailed design. • A suitably qualified ecologist to complete a site survey prior to the commencement of clearing to identify and mark high-value fauna habitat trees which are not to be removed with flagging tape (or other appropriate marking method), trees that are not to be felled without the presence of a spotter-catcher (where clearing cannot be avoided and the tree is an identified habitat trees), and to identify habitat features suitable for relocation to no disturbed areas immediately adjacent to the disturbance footprint. • Display a fact sheet on expected fauna on site notice boards and in lunch rooms, in particular threatened species such as the Western Whipbird (eastern) and Southern Emu-wren (Eyre Peninsula).

Delivery Phase	Aspect	Proposed Mitigation Measures
		<ul style="list-style-type: none"> • Install signage and exclusion barriers/bunting around areas of known fauna habitat prior to the commencement of any construction works in or within 200 m of these areas. This includes identify and fence or mark buffer areas around protected species nests that are known in the area.
		<ul style="list-style-type: none"> • Check all vegetation (trees, bushes, shrubs and grassland) for fauna, immediately prior to any vegetation removal or clearing and grubbing works.
		<ul style="list-style-type: none"> • Construct windrows (small soil berms) on the edge of access tracks and hardstands to delineate the boundary and prevent vehicles and construction equipment damaging habitat beyond the construction impact zone.
		<ul style="list-style-type: none"> • All trenches will be closed / backfilled as soon as possible and will not remain open for more than 48 hours, where possible.
		<ul style="list-style-type: none"> • All trenches and excavations will have an escape route (e.g. soil ramp) to allow entrapped fauna to escape, where practicable.
		<ul style="list-style-type: none"> • All trenches and excavations will be checked for trapped fauna first thing in the morning and again in the afternoon prior to works finishing for the day and any trapped fauna will be released.
		<ul style="list-style-type: none"> • All cable junction pits (which may be required to stay open for extended amounts of time) will be covered and/or fenced off to prevent inadvertent trapping of fauna.
		<ul style="list-style-type: none"> • If any threatened fauna species are observed during construction, work will cease in the immediate vicinity of the sighting until it has relocated, or it has been removed by a suitably qualified spotter-catcher. The fauna spotter-catcher will provide a suitable record to the Site Supervisor.
		<ul style="list-style-type: none"> • Any fauna that require relocation shall be relocated using appropriate animal hygiene. These include: <ul style="list-style-type: none"> - Wash hands between handling of different animals; - Handling of frogs will be done with the use of disposable and pre-rinsed vinyl gloves. Do not handle multiple individuals wearing the same gloves; and - Animals are to be immediately bagged in a suitably sized calico bag or plastic zip lock bag for amphibians. Do not reuse bags or use a single bag for multiple individuals.
		<ul style="list-style-type: none"> • Any fauna which are relocated will be documented throughout the course of construction and operation. This record will include: <ul style="list-style-type: none"> - Species; - Location found; - Location of relocation area; and - Condition of the animal.

Delivery Phase	Aspect	Proposed Mitigation Measures
		<ul style="list-style-type: none"> • Ensure all physical fauna control measures, such as windrows, sediment fencing, signage and exclusion barriers/bunting are checked and maintained on a regular basis (weekly as a minimum).
		<ul style="list-style-type: none"> • Speed limits to be reduced in the areas close to Launch Site A and Launch Site B to limit the likelihood of vehicle strike with wildlife.
		<ul style="list-style-type: none"> • If fauna is accidentally killed, in particular Western Whipbird, Southern Emu wren or Rock Parrot bodies are collected, reported to DEW and frozen for the SA Museum.
	Weeds and pests	<ul style="list-style-type: none"> • The Weeds and Pest Sub-plan, as a component of the CEMP and OEMP, will be implemented (refer above).
		<ul style="list-style-type: none"> • Undertake a weed survey within and immediately adjacent to the construction impact zone prior to construction commencing, to understand existing weed conditions and potential impacts (e.g. spread) during construction.
		<ul style="list-style-type: none"> • Remove or destroy all WONS and Declared and/or environmental weeds located within the construction impact zone, prior to construction commencing.
		<ul style="list-style-type: none"> • Undertake weed control such as (but not limited to) slashing, spraying, or physical removal, prior to the weeds setting seed. Ensure weed control methods within threatened species habitat areas are in accordance with the relevant National Recovery Plan for the species.
		<ul style="list-style-type: none"> • Display a fact sheet on Declared and environmental weeds known to occur within the construction impact zone, on site notice boards and in lunch rooms.
		<ul style="list-style-type: none"> • Ensure all vehicles and construction equipment are clean and free of soil material containing weed seed or propagules, prior to arriving on site. If vegetative material or earth is present, ensure that the equipment is taken away and washed down at an appropriate facility to prevent vegetative material or earth potentially containing weed seeds being brought into the site.
		<ul style="list-style-type: none"> • Install a designated wash-down bay to clean vehicles and construction equipment during construction works and prior to leaving site.
		<ul style="list-style-type: none"> • Ensure all earthmoving equipment is clean and free of soil material prior to commencing earthworks within known threatened species habitat.
		<ul style="list-style-type: none"> • Ensure all fill materials (e.g. sand, aggregate) imported to site are sourced from weed and pathogen free sites.
		<ul style="list-style-type: none"> • Locate stockpiles of clean, weed free soil or fill material away from areas of weed infestation. • If stockpiling of weed infested material is required, ensure it is stored on a constructed hardstand and separated from clean, weed free materials.

Delivery Phase	Aspect	Proposed Mitigation Measures
		<ul style="list-style-type: none"> If soil or fill material stockpiles become infested with weeds, undertake weed control (spray with herbicide) as soon as practicable and at least 10 – 14 days prior to moving material.
		<ul style="list-style-type: none"> Store construction vehicles and equipment on constructed hardstands, away from areas of weed infestation.
		<ul style="list-style-type: none"> Ensure construction compounds are kept neat and tidy at all times, to prevent pest animals from inhabiting the area.
		<ul style="list-style-type: none"> Ensure food waste is placed in enclosed / covered bins, to prevent pest animals from accessing it.
		<ul style="list-style-type: none"> Report and record rabbit / hare / fox / feral cat sightings.
	Noise	<ul style="list-style-type: none"> Locate haul routes and construction laydown areas away from sensitive receptors.
		<ul style="list-style-type: none"> Use off-site construction or other alternative processes that eliminate or lessen resulting noise.
		<ul style="list-style-type: none"> Avoid blasting.
		<ul style="list-style-type: none"> Limit construction activities to daytime unless they are unavoidable.
		<ul style="list-style-type: none"> Plan for quieter working methods, i.e. bored piles rather than driven piles.
		<ul style="list-style-type: none"> Consider using site structures as a method of acoustic screening. A noise gas gun will be used to ‘scare’ any fauna that are near the immediate area prior to launch in accordance with SA EPA <i>Environmental Noise Guidelines – Audible Bird Scaring Devices</i> (EPA 2007). This mitigation measure will reduce the number of fauna in the immediate noise zone close to the launch pad.
	Water Quality	<ul style="list-style-type: none"> Water in the basins will be tested (every 6 months) to ensure that the water meets the standard where it presents no risk to animals or other contamination issues. If there is evidence of contamination, the water will be treated to remove that contamination.
	Post Construction	Rehabilitation of disturbed areas
<ul style="list-style-type: none"> Identify stockpile locations for retaining soil and vegetation for rehabilitation purposes. 		
<ul style="list-style-type: none"> Topsoil and vegetation temporarily disturbed to support the construction of temporary laydown areas, hardstands and utilities trenching activities will be temporarily stockpiled separately to subsoil material and will be utilised to support the reestablishment of the soil profile and rehabilitation of these locations. Soil and vegetation removed for these activities will be supported to remain along the length of the disturbance footprint where the placement of the excavated material does not impact on remnant areas. 		

Delivery Phase	Aspect	Proposed Mitigation Measures
		<ul style="list-style-type: none"> • Selected logs and branches from the cleared trees (where not otherwise habitat features) are to be stockpiled in designated stockpile areas for use in rehabilitation in areas with existing tree cover (where practicable, e.g. where the action of stockpiling does not create a fire risk). • Original stockpiled materials are to be utilised to reinstate the natural soil profile in disturbed areas, being: <ol style="list-style-type: none"> 1. Subsoil; 2. Topsoil; and 3. Vegetation (where available). • The areas disturbed for construction but not forming part of the operational footprint, will be re-profiled to original or stable contours, re-establishing surface drainage lines and other land features. Site specific stabilisation measures will be necessary to prevent slumping or erosion. Erosion and sediment control is to be completed in accordance with the SEDMP. Where practicable, temporary erosion control measures will be left in place until bare soil has stabilised, and other natural material dragged over as cover until vegetation cover has re-established etc. • Revegetation is to occur through natural regeneration as well as through assisted planting to create a vegetated buffer between the disturbance footprint and adjacent values. Plantings (tube stock and seed) to consist of native species analogous to adjacent vegetation community. • All rehabilitation works to be consistent with bushfire and operational safety requirements.
Operation	Minimisation of impacts to ecology - flora and fauna values	<ul style="list-style-type: none"> • Manage visitors to the site through formalisation of tracks and signage as well as rubbish management. • Engage with LSA bodies to join region wide initiatives. <p>Bush fire risks will be mitigated through the installation of Southern Launch firefighting equipment at every launch event. Initial firefighting capabilities during rocket launch attempts will be augmented by local Country Fire Service (CFS) crews. Sufficient water will be located onsite to successfully control and contain any unexpected fire. There will also be a fire truck on site during launches.</p> <ul style="list-style-type: none"> • Annual investigations into the effect rocket launch activities have on the local fauna and flora with subsequent recommendations on the best methods to protect the regional fauna and flora. Southern Launch is currently in negotiations with University of Adelaide and University of SA with a view to sponsoring 1 or 2 PhD candidates to undertake their thesis on the Project site in respect of impacts on flora/fauna. This study/s will take approximately 4 years. This will result in a strong understanding of the impacts of operations on local flora/fauna. In respect of baseline information - the detailed studies already undertaken on the Project site as part of the Development Approval process forms that baseline.

Delivery Phase	Aspect	Proposed Mitigation Measures
	Flora	<ul style="list-style-type: none"> Display a fact sheet on threatened flora species West Coast Mintbush on site notice boards and in lunchrooms.
		<ul style="list-style-type: none"> Do not disturb the ground beneath the canopy of any tree that is not in the approved clearance footprint and ensure that vehicles, construction equipment, materials or waste are not located beneath the canopy of any tree.
		<ul style="list-style-type: none"> Maintenance activities and refuelling must be carried out a minimum of 50 m from vegetation and waterways, with appropriate interception measures in place to avoid impacts to waterways, aquatic habitats, and groundwater.
	Fauna	<ul style="list-style-type: none"> Any fauna that require relocation shall be relocated using appropriate animal hygiene. These include: <ul style="list-style-type: none"> Wash hands between handling of different animals; Handling of frogs will be done with the use of disposable and pre-rinsed vinyl gloves. Do not handle multiple individuals wearing the same gloves; and Animals are to be immediately bagged in a suitably sized calico bag or plastic zip lock bag for amphibians. Do not reuse bags or use a single bag for multiple individuals.
		<ul style="list-style-type: none"> Any fauna which are relocated will be documented throughout the course of construction and operation. This record will include: <ul style="list-style-type: none"> Species; Location found; Location of relocation area; and Condition of the animal.
		<ul style="list-style-type: none"> Ensure all physical fauna control measures, such as windrows, sediment fencing, signage and exclusion barriers/bunting are checked and maintained on a regular basis (weekly as a minimum).
		<ul style="list-style-type: none"> If any fauna needs to be destroyed under a Permit to Destroy Wildlife to reduce their impacts on wind farm infrastructure, destruction will be humane and comply with the <i>Animal Welfare Act 1985</i> and codes of practice.
		<ul style="list-style-type: none"> Speed limits to be reduced in the areas close to Launch Site A and Launch Site B to limit the likelihood of vehicle strike with wildlife.
		<ul style="list-style-type: none"> If fauna is accidentally killed, in particular Western Whipbird, Southern Emu wren or Rock Parrot bodies are collected, reported to DEW and frozen for the SA Museum.
		<ul style="list-style-type: none"> Prevent establishment of new weed species and/or infestations during the operational phase by implementing standard hygiene practices when bringing equipment, vehicles and other materials which have the potential to harbour weed seed or propagules, onto the site (e.g. for maintenance purposes) and by practicing minimal disturbance methods.
Weeds and pests	<ul style="list-style-type: none"> Prevent establishment of new weed species and/or infestations during the operational phase by implementing standard hygiene practices when bringing equipment, vehicles and other materials which have the potential to harbour weed seed or propagules, onto the site (e.g. for maintenance purposes) and by practicing minimal disturbance methods. 	

Delivery Phase	Aspect	Proposed Mitigation Measures
		<ul style="list-style-type: none"> Conduct an annual survey to identify and monitor the location, extent and abundance of weed species, particularly WONS and Declared weed species.
		<ul style="list-style-type: none"> Control pest animal species (especially rabbits, foxes and feral cats) that may proliferate as a result of site activities. Ensure rabbit control is in accordance with the <i>Threat abatement plan for competition and land degradation by rabbits</i> (DotEE 2016).
		<ul style="list-style-type: none"> Ensure waste is unable to be accessed by pest animals.
	Noise	<ul style="list-style-type: none"> Use earth bunds to reduce noise during rocket take-off.
		<ul style="list-style-type: none"> Use site structures as a method of acoustic screening for noisy equipment.
		<ul style="list-style-type: none"> Implementation of a water deluge and flame trench, which reduce the noise level by approximately 5-10dB.
		<ul style="list-style-type: none"> Locate launch sites as far away from residential and other sensitive areas as possible.
		<ul style="list-style-type: none"> Development of a stakeholder engagement plan with procedures for notifying residents of all planned launch events in advance.
		<ul style="list-style-type: none"> Develop a noise monitoring and reporting program to verify noise impacts of rocket launches.
	Water Quality	<ul style="list-style-type: none"> The captured deluge water and firefighting water will be tested after every launch. If it meets the required quality standard, it will be pumped into the water detention basins. If it does not, it will be pumped into trucks and taken off site to be disposed of in a manner that meets legislative requirements
		<ul style="list-style-type: none"> Water in the basins will be tested (every 6 months) to ensure that the water meets the standard where it presents no risk to animals or other contamination issues. If there is evidence of contamination, the water will be treated to remove that contamination.
	Offsets	<ul style="list-style-type: none"> Ensure all monitoring, auditing and reporting requirements detailed in the biodiversity and native vegetation offset strategy are implemented during the operation phase of the Project.