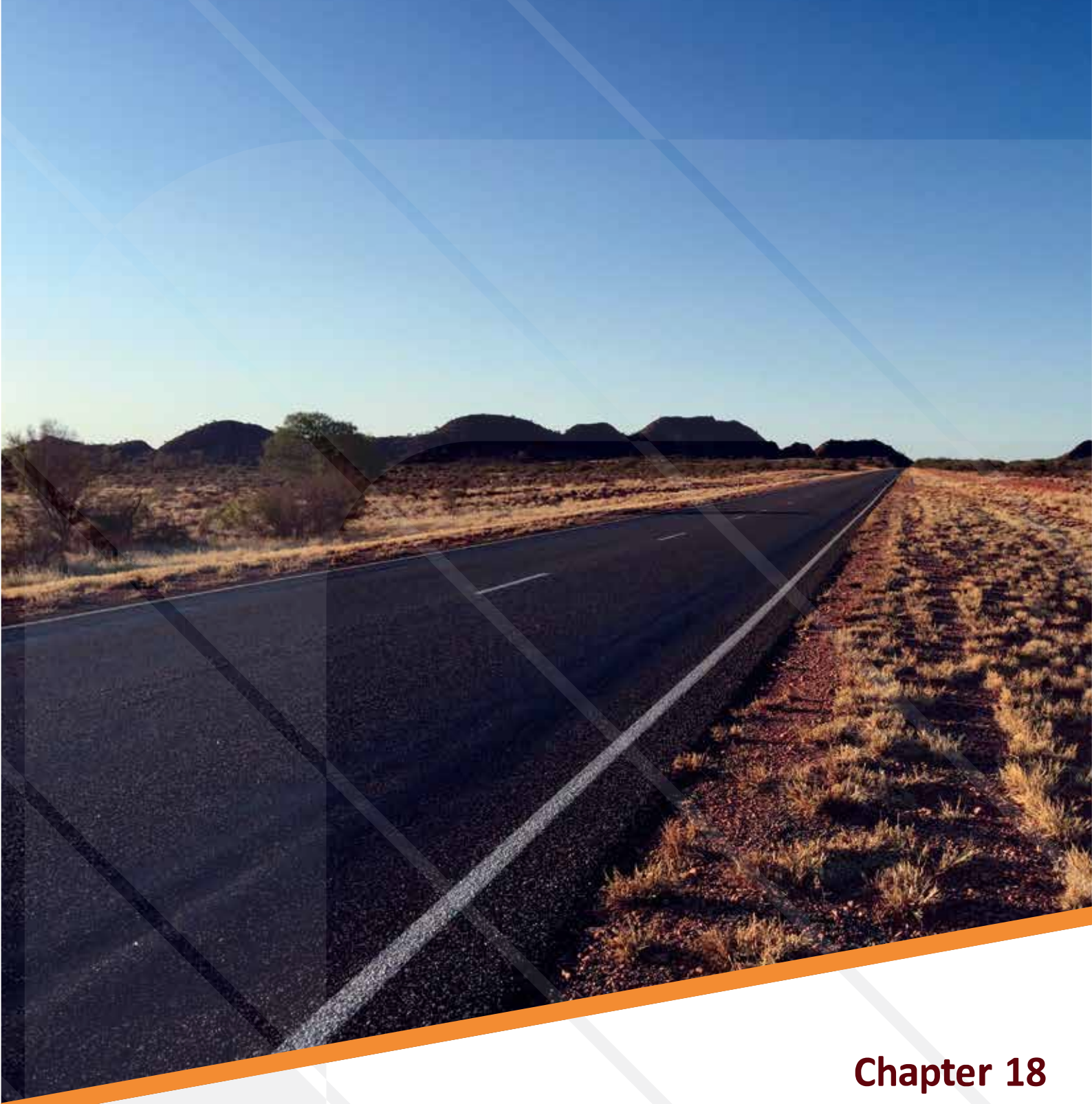




Chapter 18

Other Risks



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ABBREVIATIONS

AADT	Annual Average Daily Traffic
AS	Australian Standard
CEMP	Construction Environmental Management Plan
DoEE	Department of Energy and Environment
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
NT	Northern Territory
OEMP	Operational Environmental Management Plan
PFS	Pre-Feasibility Study
RCP	Rehabilitation Closure Plan



18 OTHER RISKS

18.1 Public health and food

18.1.1 Introduction

This section discusses the requirements food safety, staff accommodation and sanitary facilities, on-site wastewater disposal, trade waste pre-treatment devices, potable water supply, bores, fuel storage, public health nuisance abatement, occupational health and safety and environmental management plans with regard to the NT Department of Health – Environmental Health *Environmental Fact Sheet No. 700: Requirements for Mining and Construction Projects* (2014a). The requirements for solid waste disposal, waste stabilisation ponds and radioactive sources are not addressed as they would not be applicable to the Proposal.

18.1.2 Food safety requirements

The proposed accommodation village is defined as a food business under the NT *Food Act*. It would, therefore, require registration with the NT Department of Health – Environmental Health in accordance with the NT *Food Act*.

The proposed accommodation village would be designed to meet the minimum standards prescribed by the National Food Safety Standards prescribed by Food Standards Australia New Zealand. These standards include:

- Standard 3.1.1 Interpretation and Application.
- Standard 3.2.2 Food Safety Practices and General Requirements.
- Standard 3.2.3 Food Premises and Equipment.

It would also be designed in accordance with Australian Standard (AS) 4674 *Design, Construction and Fit-out of Food Premises*. Food premises that meet the requirements contained within AS 4674 are deemed to comply with the NT *Food Act* and the National Food Safety Standards.

The proposed accommodation village would be located outside of a Building Control Area, as mapped by the NT Department of Health – Environmental Health in *Environmental Fact Sheet No. 700: Requirements for Mining and Construction Projects* (2014a). As such, detailed plans and specifications of the accommodation village with regard to food safety would be submitted to the relevant Environmental Health Officer within the NT Department of Health prior to the construction. Following assessment and approval, and prior to operation, the accommodation village would be registered with the relevant Environmental Health Office.



18.1.3 Staff accommodation and sanitary facilities

All public accommodation including staff accommodation must be maintained in a good state of repair and in a clean and sanitary condition so as not to cause a public health nuisance in accordance with the NT *Public and Environmental Health Act*. The general requirements for conducting a public accommodation business such as the need to prevent overcrowding and provide an acceptable standard of sanitation, amenity and safety are outlined in the NT Department of Health – Environmental Health *Public and Environmental Health Guidelines for Public Accommodation* (2014b).

The proposed accommodation village would be maintained in accordance with the NT *Public and Environmental Health Act* and with the requirements set out by NT Department of Health – Environmental Health in the *Public and Environmental Health Guidelines for Public Accommodation* (2014b). An adequate number of sanitary facilities would be provided at the proposed accommodation village in accordance with the Building Code of Australia.

As discussed above, the proposed accommodation village would be located outside of a Building Control Area, as mapped by the NT Department of Health – Environmental Health (2014a). As such, detailed plans and specifications of the accommodation village with regards to staff accommodation and sanitary facilities would be submitted to the relevant Environmental Health Officer within the NT Department of Health prior to the construction. Following assessment and approval, and prior to operation, the accommodation village would be registered with the relevant Environmental Health Office.

18.1.4 On-site wastewater disposal

Alternative septic tank systems treat effluent to a higher quality than that offered by conventional septic tank systems. An aerated wastewater treatment system is an example of an alternative septic tank system and would be installed at the proposed accommodation village. In addition to the self-certification of the installation, the aerated wastewater treatment system would require wastewater works design approval by the NT Department of Health – Environmental Health under the provisions of the NT *Public and Environmental Health Act* and Public and Environmental Health Regulations.

18.1.5 Trade waste pre-treatment devices

Trade waste is defined as a 'liquid or liquid borne waste generated from any industry, business, trade, manufacturing process or similar that is approved for discharge to sewer but does not include wastewater from a toilet, shower, hand basin or similar fixture' (NT Department of Health – Environmental Health 2014a). Commercial food premises at the accommodation village may prepare cooked food generating liquid waste that includes food scraps, detergents, fats, oils and grease.

Liquid trade waste generated at the proposed accommodation village would be discharged to sewer via a pre-treatment device(s) that have been approved by NT Power and Water Corporation – Trade Waste Section.



18.1.6 Potable water supply

A proposed bore field would be constructed approximately two kilometres to the north-east of the proposed Chandler Facility. Water extracted from bores at the borefield would be treated at a water treatment plant for potable use (consumption) and for other domestic uses (the preparation of food, bathing, washing of clothes and dishes, etc.). Treatment processes may include reverse osmosis, ultraviolet sterilisation, chlorination, or others, as required. The water would be routinely analysed to ensure that it meets the requirements of the *Australian Drinking Water Guidelines (2011) – Updated February 2016* developed by the by the National Health and Medical Research Council in collaboration with the Natural Resource Management Ministerial Council. In addition, a general chemical and metals analysis would also be routinely undertaken.

18.1.7 Bores

Bores within the borefield would be constructed to the standards outlined in the *Minimum Construction Requirements for Water Bores in Australia, Third Edition* (Australian Government National Water Commission 2012). Bore setbacks to on-site wastewater disposal would be in accordance with the NT *Code of Practice for On-site Wastewater Management* (Environmental Health Program Directorate Territory Health Services 2014).

18.1.8 Fuel storage

Fuel, oil or hazardous materials would be stored on-site for general construction and operational activities. These materials would be stored in designated bunded area at the proposed Chandler Facility and at the proposed Apirnta Facility. These materials would be stored and handled on-site in accordance with AS 1940-2004 *Storage and Handling of Flammable and Combustible Liquids*.

18.1.9 Solid waste disposal

Solid waste would be collected in designated bins and trucked off-site to appropriately licenced waste facilities in Titjikala or Alice Springs, as appropriate. There would be no requirement for a solid waste landfill on-site. Opportunities for composting food waste would be explored during detailed design of the Proposal.

18.1.10 Public health nuisance abatement

Activities associated with construction, operation and closure and rehabilitation have the potential to result in air quality impacts (in the form of dust) and also impacts to groundwater and surface water. These impacts would be avoided or reduced by implementing the mitigation measures outlined in Chapter 8, Chapter 9 and Chapter 15.



18.1.11 Occupational health and safety

Activities associated with construction, operation, and rehabilitation and decommissioning would be carried out in accordance with occupational health and safety legislation administered by NT WorkSafe and in accordance with a Safety Case¹.

18.1.12 Environmental management plans

The sections of the CEMP as they relate to the accommodation village would be provided to the relevant Environmental Health Office for review and comment prior to construction. Similarly, the sections of the OEMP as they relate to the accommodation village would be provided to the Environmental Health Office for review and comment prior to operation.

18.1.13 Mitigation and monitoring

The Proposal would be designed, constructed and operated in accordance with the requirements set out in the NT Department of Health – Environmental Health *Environmental Fact Sheet No. 700: Requirements for Mining and Construction Projects* (2014a). These requirements are listed in Table 18-1. These requirements would be incorporated into the CEMP, OEMP and RCP for the Proposal.

18.1.14 Conclusion

The Proposal would be designed, constructed and operated in accordance with the requirements set out in the NT Department of Health – Environmental Health *Environmental Fact Sheet No. 700: Requirements for Mining and Construction Projects* (2014a). Specifically, the requirements for food safety, staff accommodation and sanitary facilities, on-site wastewater disposal, trade waste pre-treatment devices, potable water supply, bores, fuel storage, public health nuisance abatement, occupational health and safety and environmental management plans would be adhered to. The requirements for solid waste disposal, waste stabilisation ponds and radioactive sources are not addressed as they would not be applicable to the Proposal.

¹ Note – Following submission and approval of the Proposal, the proponent would prepare and submit a Safety Case report to NT WorkSafe.



Table 18-1 Mitigation and management measures (public health and food)

ID	Outcome	Mitigation/management measure	Timing
PHF.1	Adherence with the environmental health requirements of the NT Department of Health – Environmental Health.	Design, construct and operate the Proposal in accordance with the requirements set out in the NT Department of Health – Environmental Health <i>Environmental Fact Sheet No. 700: Requirements for Mining and Construction Projects</i> (2014).	Pre-construction, construction and operation
PHF.2	Adherence with food safety requirements of the NT Department of Health – Environmental Health.	Register the proposed accommodation village with the NT Department of Health – Environmental Health in accordance with the NT <i>Food Act</i> .	Pre-construction
PHF.3	Adherence with food safety requirements of the NT Department of Health – Environmental Health.	Design accommodation village to meet the minimum standards prescribed by the National Food Safety Standards prescribed by Food Standards Australia New Zealand and in accordance with Australian Standard (AS) 4674 <i>Design, Construction and Fit-out of Food Premises</i> .	Pre-construction
PHF.4	Adherence with food safety requirements of the NT Department of Health – Environmental Health.	Submit detailed plans and specifications of the accommodation village with regard to food safety (prior to construction) to the relevant Environmental Health Officer within the NT Department of Health.	Pre-construction
PHF.5	Adherence with food safety requirements of the NT Department of Health – Environmental Health.	Register accommodation village following assessment and approval (prior to operation) with the relevant Environmental Health Office.	Pre-operation
PHF.6	Adherence with staff accommodation and sanitary facilities requirements of the NT Department of Health – Environmental Health.	Maintain accommodation village in accordance with the NT <i>Public and Environmental Health Act</i> and with the requirements set out by NT Department of Health – Environmental Health in the <i>Public and Environmental Health Guidelines for Public Accommodation</i> (2014).	Operation
PHF.7	Adherence with staff accommodation and sanitary facilities requirements of the NT Department of Health – Environmental Health.	Provide an adequate number of sanitary facilities at the proposed accommodation village in accordance with the Building Code of Australia.	Operation
PHF.8	Adherence with staff accommodation and sanitary facilities requirements of the NT Department of Health – Environmental Health.	Submit detailed plans and specifications of the accommodation village with regard to staff accommodation and sanitary facilities (prior to construction) to the relevant Environmental Health Officer within the NT Department of Health.	Pre-construction
PHF.9	Adherence with staff accommodation and sanitary facilities requirements of the NT Department of Health – Environmental Health.	Register accommodation village following assessment and approval (prior to operation) with the relevant Environmental Health Office.	Pre-operation



ID	Outcome	Mitigation/management measure	Timing
PHF.10	Adherence with on-site wastewater disposal requirements of the NT Department of Health – Environmental Health.	Submit aerated wastewater treatment system for wastewater works design approval by the NT Department of Health – Environmental Health in accordance with the provisions of the NT <i>Public and Environmental Health Act</i> and Public and Environmental Health Regulations.	Pre-construction
PHF.11	Adherence with on-site wastewater disposal requirements of the NT Department of Health – Environmental Health.	Obtain approval for liquid trade waste pre-treatment device(s) at the accommodation village from the NT Power and Water Corporation – Trade Waste Section.	Pre-construction
PHF.12	Adherence with potable water supply requirements of the NT Department of Health – Environmental Health.	Potable water would be routinely analysed to ensure that it meets the requirements of the <i>Australian Drinking Water Guidelines (2011) – Updated February 2016</i> developed by the by the National Health and Medical Research Council in collaboration with the Natural Resource Management Ministerial Council. In addition, a general chemical and metals analysis would also be routinely undertaken.	Construction and operation
PHF.13	Adherence with bores requirements of the NT Department of Health – Environmental Health.	Ensure that bores within the borefield are constructed to the standards outlined in the <i>Minimum Construction Requirements for Water Bores in Australia, Third Edition</i> (Australian Government National Water Commission 2012).	Pre-construction
PHF.14	Adherence with bores requirements of the NT Department of Health – Environmental Health.	Ensure that bore setbacks to on-site wastewater disposal would be in accordance with the NT <i>Code of Practice for On-site Wastewater Management</i> (Environmental Health Program Directorate Territory Health Services 2014).	Pre-construction
PHF.15	Adherence with fuel storage requirements of the NT Department of Health – Environmental Health.	Ensure that fuels are stored and handled on-site in accordance with AS 1940-2004 <i>Storage and Handling of Flammable and Combustible Liquids</i> .	Construction, operation, and closure and rehabilitation
PHF.16	Responsible disposal of solid waste.	Solid waste would be collected in designated bins and trucked off-site to appropriately licenced waste facilities in Titjikala or Alice Springs, as appropriate.	Construction, operation, and closure and rehabilitation
PHF.17	Reduce off-site disposal of food waste.	Explore opportunities for composting food waste during detailed design of the Proposal.	Construction
PHF.18	Adherence with public health nuisance abatement requirements of the NT Department of Health – Environmental Health.	Implement mitigation measures listed under groundwater, surface water and air quality.	Construction, operation, and



ID	Outcome	Mitigation/management measure	Timing
			closure and rehabilitation
PHF.19	Adherence with occupational health and safety requirements of the NT Department of Health – Environmental Health.	Ensure that activities associated with construction, operation, and closure and rehabilitation are carried out in accordance with occupational health and safety legislation administered by NT WorkSafe and in accordance with the Safety Case.	Construction, operation and, and closure and rehabilitation
PHF.20	Adherence with environmental management plan requirements of the NT Department of Health – Environmental Health.	Provide relevant sections of the CEMP and OEMP to the Environmental Health Office for review and comment prior to construction and operation.	Pre-construction and pre-operation

18.2 Biting insects

18.2.1 Introduction

This section describes the likelihood of occurrence of biting insects (specifically mosquitos) within the proposed development footprint and vicinity. The potential to possibly increase the mosquito population within the proposed development footprint and vicinity through the development of favourable breeding environments is presented. This section also presents mitigation measures to prevent an increase in biting insects within the proposed development footprint and vicinity and to protect personnel during construction, operation, and closure and rehabilitation of the Proposal.

18.2.2 Existing environment

The presence of biting insects within the proposed development footprint and vicinity is highly variable and dependent on breeding conditions determined by warm seasonal rainfall. The existing surface hydrology of the proposed development footprint and vicinity consists of ephemeral watercourses, claypans, swamps and a purpose-built pastoral dam called Halfway Dam. Halfway Dam is the only permanent surface water source located in the region.

There are two major ephemeral watercourses located more than 20 kilometres from the proposed Chandler Facility (the Hugh River and Finke River).

Claypans and swamps occur mostly on the downstream side of the proposed Chandler Haul Road and at various locations along the proposed Henbury Access Road. Duck Swamp is located approximately one kilometre north and east of the proposed Henbury Access Road. Swamps and claypans can retain surface water for hours or days at a time depending on the duration of rainfall and volume of water received within the local sub-catchment.

Surface waterholes can be found for a small amount of time after rainfall in creek lines, drainage depressions and claypans. The proposed development footprint and vicinity experiences evaporation rates in excess of three metres per annum, consequently water holes dry quickly during the summer.

A number of mosquito species, several of which have the potential to cause discomfort and others that have the potential to carry disease, are likely to occur within the proposed development footprint or vicinity. These species are listed in Table 18-2.

Table 18-2 Species of mosquitos likely to occur within the proposed development footprint or vicinity

Scientific name	Common name	Breeding places	Disease potential	Likelihood of occurrence
<i>Aedes notoscriptus</i>	Receptacle mosquito	Tree holes, rock pools, fallen palm fronds and rain filled receptacles.	Suspected vector of Ross River virus.	Likely
<i>Aedes tremulus</i>	Pale larvae mosquito	Holes in trees/stumps and artificial receptacles.	Not known to carry diseases in Australia.	Likely
<i>Culex annulirostris</i>	Common banded mosquito	Freshwater swamps, vegetated streams, storm water drains, grassy edges of sewage ponds, inundated low lying grassy areas. It has been found in brackish water, although is not usually found in areas exceeding one third salt water.	Vector of Murray Valley encephalitis virus in Australia, capable of carrying Kunjin virus, Ross River virus and Barmah Forest virus.	Recorded during biodiversity field surveys in the riparian zone along the Finke River in 2015. Likely widespread.
<i>Culex quinquefasciatus</i>	Brown house mosquito	Septic tanks, stormwater drains, sumps, gully traps and any artificial receptacle holding water.	Low	Likely

Source: Whelan, 2010.

18.2.3 Assessment of risk during construction, operation, and closure and rehabilitation

Activities associated with construction and operation of the Proposal have the potential to effect and possibly increase the mosquito population within the proposed development footprint and vicinity through the development of favourable breeding environments.

The creation of infrastructure such as surface water retention ponds, drainage swales, check dams and weirs could provide mosquito breeding habitat within the proposed development footprint or vicinity, although none of these would have standing water for very long given the high evaporation rates (in excess of three metres per annum) in the area. Artificial receptacles such as containers, tins, tyres or drums could also create favourable breeding environments after rainfall events.

18.2.4 Mitigation and monitoring

Mitigation and management measures proposed to prevent an increase in biting insects within the proposed development footprint and vicinity and to protect personnel during construction, operation, and closure and rehabilitation of the Proposal are listed in Table 18-3. These measures would be incorporated into the CEMP, OEMP and RCP for the Proposal. A draft Biting Insect Management Plan has also been prepared. This is included in Appendix Y.

The mitigation and management measures listed in Chapter 9 would be implemented to minimise alterations to the hydrology of the proposed development footprint and vicinity. This would, in turn, prevent an increase in biting insects within the proposed development footprint and vicinity.

Table 18-3 Mitigation and management measures (biting insects)

ID	Outcome	Mitigation/management measure	Timing
BI.1	Negligible increase in biting insects and protection of personnel from biting insects.	Finalise draft Biting Insect Management Plan prior to construction and incorporate into the CEMP and OEMP. The plan collates measures to mitigate and manage potential impacts on biodiversity.	Pre-construction
BI.2	Protection of personnel from biting insects.	Implement personnel protection measures in accordance with the NT Government Department of Health Guidelines <i>Personal Protection From Mosquitoes and Biting Insects in the NT</i> .	Construction, operation, closure and rehabilitation
BI.3	Negligible increase in biting insects.	Control and manage potential mosquito breeding sites in accordance with the NT Government Department of Health <i>Guidelines for Preventing Mosquito Breeding Sites Associated with Mining Sites</i> .	Construction, operation, closure and rehabilitation
BI.4	No ponding of water (no breeding habitat for mosquitos).	Ensure containers capable of ponding water are stored under cover, contain drainage holes, are emptied within five days, are treated with appropriate insecticide or disposed of appropriately according to the Waste Management Plan.	Construction, operation, closure and rehabilitation
BI.5	Protection of personnel from biting insects.	Ensure accommodation village is adequately screened.	Construction
BI.6	Negligible increase in biting insects.	Ensure no actual or potential mosquito breeding sites remain after decommissioning of the Proposal. Ensure disturbed areas are rehabilitated and free draining. Remove infrastructure that has the potential to pond water.	Closure and rehabilitation

18.2.5 Conclusion

The creation of infrastructure such as surface water retention ponds, drainage swales, check dams and weirs could provide mosquito breeding habitat within the proposed development footprint or vicinity, although none of these would have standing water for very long given the high evaporation rates (in excess of three metres per annum) in the area. Artificial receptacles such as containers, tins, tyres or drums may also create favourable breeding environments for biting insects after rainfall events.

Mitigation and management measures would be incorporated into a Biting Insect Management Plan to prevent an increase in biting insects within the proposed development footprint and vicinity and to protect personnel during construction, operation, and closure and rehabilitation of the Proposal.

18.3 Greenhouse gas assessment

18.3.1 Introduction

This section provides an assessment of greenhouse gas impacts during construction and operation of the Proposal. This section draws on a comprehensive greenhouse gas assessment provided in Appendix X.

18.3.2 Methodology

The methodology for the greenhouse gas assessment is summarised below with further detail provided in Appendix Y. The assessment encompassed a number of components including the proposed Chandler Facility and the Apirnta Facility. The assessment also considered the transfer of materials between the proposed Chandler Facility, Apirnta Facility and the Stuart Highway.

Activities performed during construction and operation with the potential to result in emissions of greenhouse gases were identified. The activity rate for each of these activities (e.g. kilolitres of fuel used per annum, hectares of land to be cleared) was subsequently calculated, or was based on clearly defined assumptions.

Emission factors for each activity were sourced from the *National Greenhouse Accounts Factors, Australian National Greenhouse Accounts* (Department of the Environment 2015). Other appropriate documentation was also used which allowed for the calculation of direct emissions (e.g. land clearance or fuel combustion) and indirect emissions (e.g. extraction and processing of fuels).

Emissions were calculated for each activity and are provided as annual total emissions for the construction and operation of the Proposal.

18.3.3 Assessment of risk during construction and operation

Direct emissions during construction are calculated to be 13,205.5 t CO₂-e per year with over half of emissions due to land clearance activities that would be undertaken during construction of the proposed Henbury Access Road and Chandler Haul Road. During operation, direct emissions are calculated to be 104,310.2 t CO₂-e per year.

Indirect emissions are calculated to be minor during construction at 155.0 t CO₂-e per year with emissions during operation anticipated to be 5,351.4 t CO₂-e per year.

These data indicate that the construction of the Proposal in its entirety would contribute up to 0.1% of total greenhouse gas emissions in the NT and up to 0.002% of total greenhouse gas emissions in Australia when compared to a base year of 2014. Operation of the Proposal in its entirety is anticipated to contribute up to 0.8% of total greenhouse gas emissions in the NT and up to 0.02% of total greenhouse gas emissions in Australia when compared to a base year of 2014.

18.3.4 Mitigation and monitoring

Mitigation and management measures proposed to reduce greenhouse gas emissions during construction, operation, and closure and rehabilitation of the Proposal are listed in Table 18-4. These measures would be incorporated into the CEMP, OEMP and RCP for the Proposal.

A number of sustainability measures would be incorporated into the design of the Proposal. For example, solar energy would be used to supplement the power requirements of the proposed Chandler Facility and Apirnta Facility (a two megawatt solar farm would be installed at the proposed Chandler Facility). These measures would ensure that greenhouse gas emissions are minimised to the maximum extent possible.

During detailed design, the proponent would investigate options for participation in the DoEE Emissions Reduction Fund.

Table 18-4 Mitigation and management measures (greenhouse gases)

ID	Outcome	Mitigation/management measure	Timing
GHG.1	Minimise greenhouse gas emissions.	Ensure vehicles/plant and machinery are turned off when not in use and regularly serviced to ensure efficient operation.	Construction, operation, closure and rehabilitation
GHG.2	Minimise greenhouse gas emissions.	Design truck routes and loading capacity to reduce the distance and effort required by vehicles.	Construction
GHG.3	Minimise greenhouse gas emissions.	Use B5 and E10 fuel in plant and equipment, where possible.	Construction, operation, closure and rehabilitation
GHG.4	Minimise greenhouse gas emissions.	Perform regular energy and water audits.	Operation
GHG.5	Minimise greenhouse gas emissions.	Install window blinds in all office areas.	Construction
GHG.6	Minimise greenhouse gas emissions.	Maximise the area covered by the solar farm to minimise fuel used in electricity generation.	Construction
GHG.7	Minimise greenhouse gas emissions.	Install sensor lighting to minimise the number of lights being operated when not required.	Construction
GHG.8	Minimise greenhouse gas emissions.	Use, energy efficient lighting, where possible.	Construction
GHG.9	Minimise greenhouse gas emissions.	Develop building maintenance policies and a building user guide to ensure efficient operation of plant and equipment.	Operation
GHG.10	Minimise greenhouse gas emissions.	Develop heating, ventilation and air conditioning key performance indicators and building performance targets.	Operation
GHG.11	Minimise greenhouse gas emissions.	Ensure sub-metering is in place to monitor electricity and water consumption throughout the Proposal.	Operation

18.3.5 Conclusion

The assessment presents an estimate of the greenhouse gas emissions which would be produced during both the construction and operation of the Proposal. The estimates indicate that the Proposal would contribute less than 1% of total greenhouse gas emissions in the NT, and 0.02% of total greenhouse gas emissions in Australia, when compared to a base year of 2014.

Sustainability would be a key consideration in the design, construction and operation of the Proposal. Inclusion of a two megawatt solar farm, use of energy efficient plant and equipment and a number of other measures would be incorporated into the Proposal to ensure that greenhouse gas emissions are minimised to the maximum extent possible.

During detailed design, the proponent would investigate options for participation in the DoEE Emissions Reduction Fund.

18.4 Traffic

18.4.1 Introduction

This section describes the existing road and rail traffic and transportation network within the vicinity of the Proposal. The potential for road and rail traffic and transportation impacts is discussed and mitigation measures are presented to reduce potential traffic and transportation impacts during construction, operation, and closure and rehabilitation of the Proposal.

18.4.2 Methodology

A qualitative assessment of road and rail traffic and transportation impacts was undertaken given the spare capacity of the existing road and rail network and the low numbers of road and rail traffic that would be generated during construction, operation, and closure and rehabilitation of the Proposal.

Road traffic count data was obtained from the NT Department of Transport. Rail traffic count data was obtained from Genesee Wyoming.

Estimates of road and rail traffic generated during construction, operation, and closure and rehabilitation were calculated based on a prefeasibility study undertaken by the proponent for the Proposal.

For the purposes of this assessment, a vehicle movement was defined as a one-way trip (that is, a return trip would be two vehicle movements).

18.4.3 Existing environment

Existing road and rail network

The existing road and rail network in the vicinity of the Proposal is shown in Figure 18-1. A description of the road network is as follows:

- **Access tracks.** There are a number of unpaved access tracks located within the proposed development footprint and vicinity that are currently used by the operators of Maryvale Station and Henbury Station. Two of these access tracks would be converted into the proposed Henbury Access Road and Chandler Haul Road.

- Maryvale Road.** Maryvale Road is an unpaved public road 120 kilometres long that stretches between Alice Springs and the community of Titjikala. It is primarily used to access Maryvale Station and links to the Chambers Pillar Road. Sections of the Maryvale Road are used for the Finke Desert Race (refer to Plate 18-1). Some sections of Maryvale Road are prone to flooding during heavy rainfall. Following heavy rainfall and after the Finke Desert Race, the road is unusable and requires regrading.



Plate 18-1 Maryvale Road

- Chambers Pillar Road.** Chambers Pillar Road is an unpaved public road that stretches between Maryvale Station to Chambers Pillar (refer to Plate 18-2). It is primarily used by station operators and tourists to access Chambers Pillar and the Chambers Pillar Nature Reserve located approximately 30 kilometres to the west of the Proposal.



Plate 18-2 Chambers Pillar Road (in the vicinity of where the proposed Chandler Haul Road would cross Chambers Pillar Road)

- Stuart Highway.** The Stuart Highway is one of Australia's major highways. It is approximately 2,834 kilometres in length and stretches from Darwin in the NT via Tennant Creek and Alice Springs to Port Augusta in South Australia. It is a paved, single-lane highway with speeds up to of 130 kilometres per hour in the vicinity of the Proposal (refer to Plate 18-1). Dangerous Goods are regularly transported from Adelaide to Darwin and vice versa along the Stuart Highway.



Plate 18-3 The Stuart Highway (in the vicinity of the proposed T-intersection at Henbury Access Road)

The Central Australian Railway is a north–south railway line that stretches approximately 1,420 kilometers between Darwin in the NT and Adelaide in South Australia. The railway is used to transport both freight and passengers. The Central Australian Railway is located approximately 60 kilometres to the east of the Stuart Highway in the vicinity of the Proposal. The proposed Apirnta Facility would be located adjacent to the Central Australian Railway (refer to Plate 18-2).



Plate 18-4 The Central Australian Railway (in the vicinity of the proposed Apirnta Facility)

Existing road and rail traffic volumes

2013 and 2014 Annual Average Daily Traffic (AADT) volumes along various sections of the Stuart and Barkly Highways is listed in Table 18-5. The nearest traffic count stations are:

- RAVDP010 being 100 kilometres south of Alice Springs (refer to Figures 18-1 and 18-2).
- RAVDC051 being about 100 kilometres from the community of Titjikala.

The turn off to the Henbury Access Road is approximately 140 kilometres south of Alice Springs. Total inbound and outbound AADT were 500 at this location. At the Maryvale count station, AADT total numbers for 2014 were considerable less (127).

Table 18-5 Baseline road traffic volumes along the Stuart and Barkly Highways

Count station	Route	Location	2013			2014		
			Total	In	Out	Total	In	Out
RTVDP001	Stuart Hwy	North of Threeways (100 metres)	410	219	191	411	213	198
RTVDC029	Barkly Hwy	Radio Repeater 8501	264	144	120	270	134	136
RTVDC004	Barkly Hwy	East of Stuart Hwy (10 kilometres)	254	130	124	247	121	126
RTVDP003	Stuart Hwy	South of Threeways (5 kilometres)	389	203	186	395	205	190
RTVDP002	Stuart Hwy	South of Tennant Creek (10 kilometres)	410	212	198	403	207	196
RAVDP014	Stuart Hwy	North of Tanami Hwy (1.5 kilometers)	590	299	291	608	312	296
RAVDP001	Stuart Hwy	North of Alice Springs (3 kilometres)	963	494	469	978	500	478
RAVDC073	Stuart Hwy	South of Airport Intersection (1 kilometers)	1,388	688	700	1,591	806	785
RAVDP010	Stuart Hwy	South of Alice Springs (100 kilometres)	503	252	251	500	254	246
RAVDP003	Stuart Hwy	North of Kulgera (200 metres)	304	168	136	313	172	141
RAVDC051	Maryvale Road	16 kilometres south of Santa Teresa Road	-	-	-	127	63	64

SOURCE: Annual Traffic Report 2015 Territory Asset Management Services

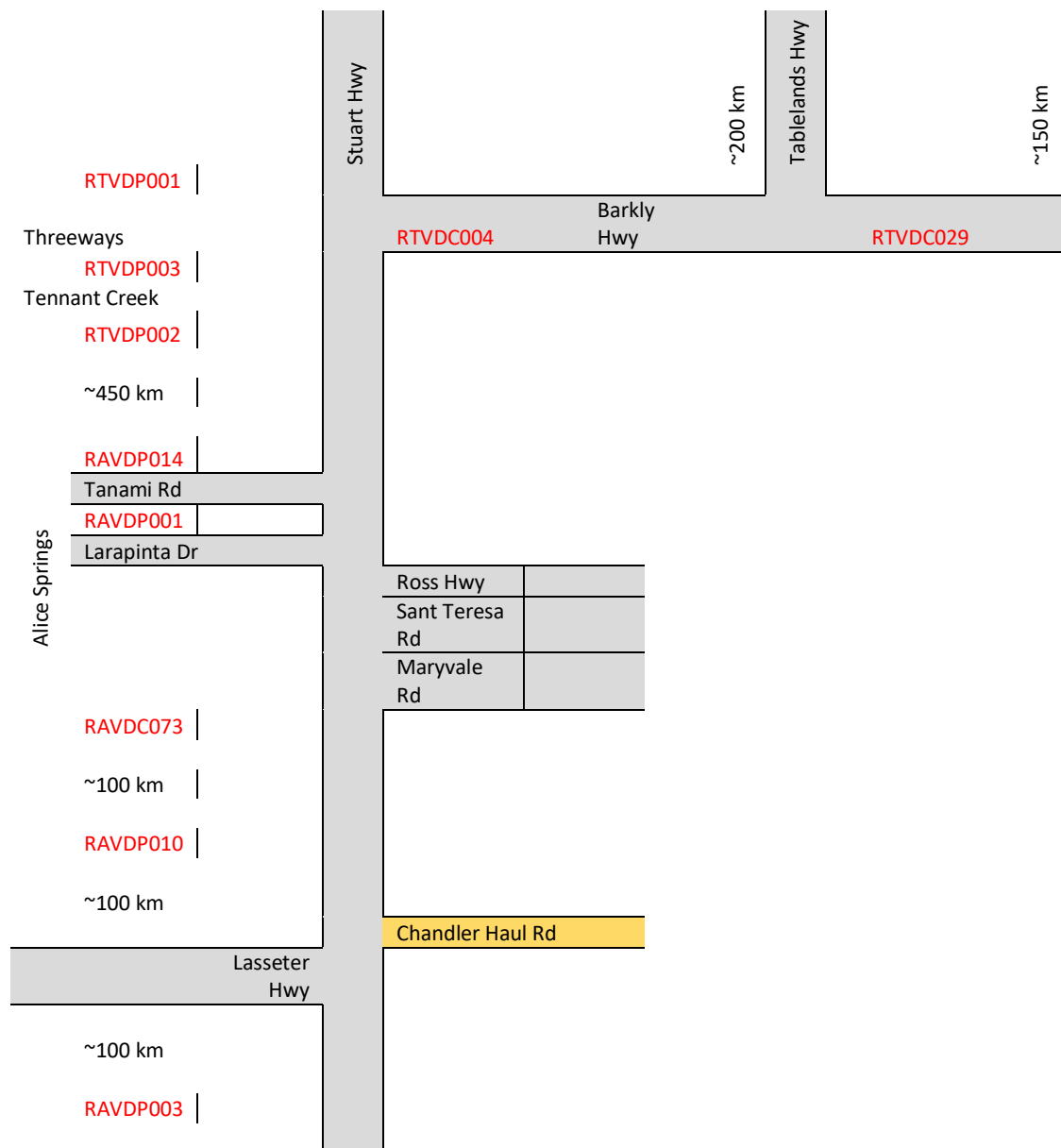


Figure 18-1 Schematic of traffic count data locations in relation to the Proposal

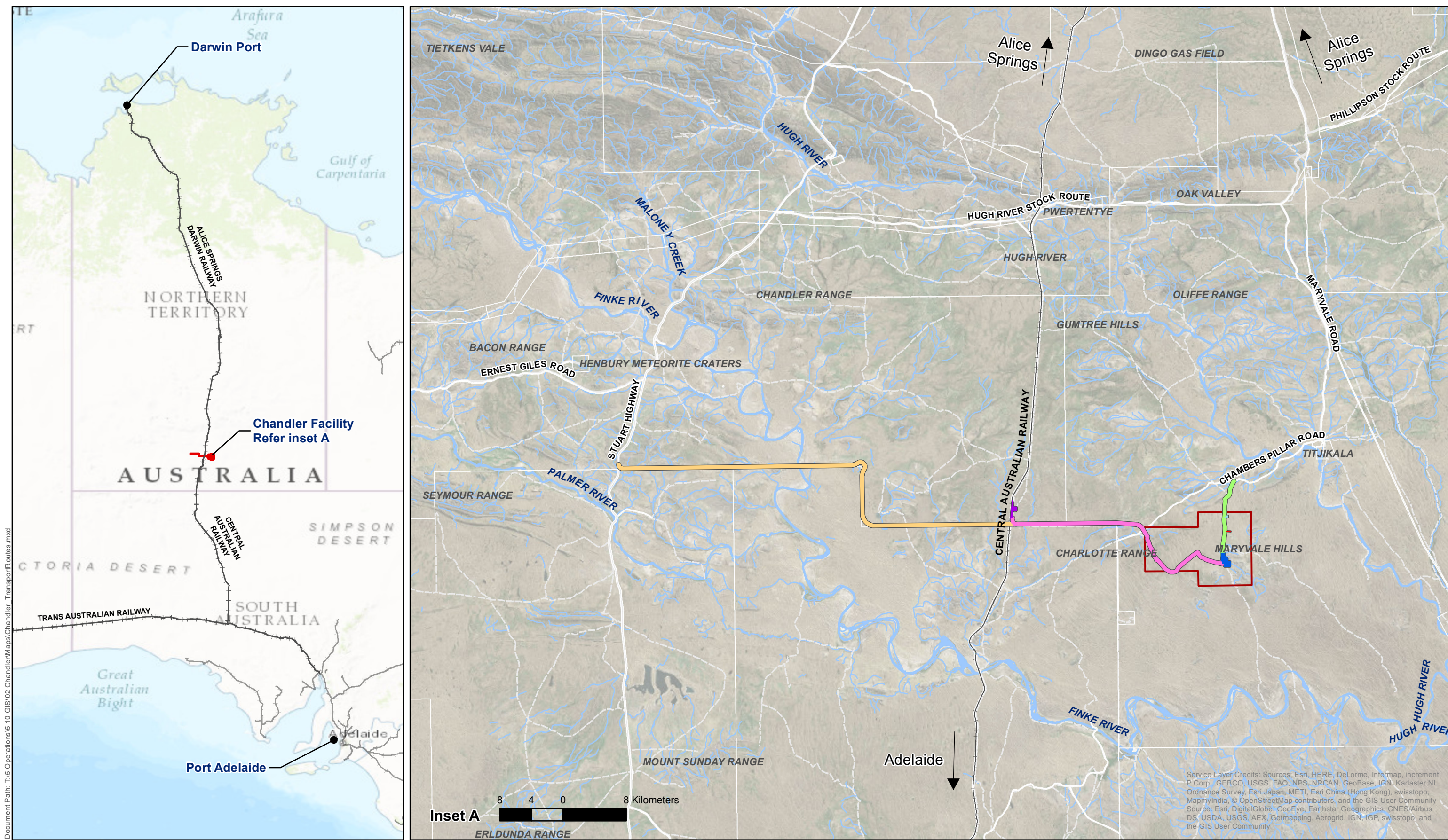
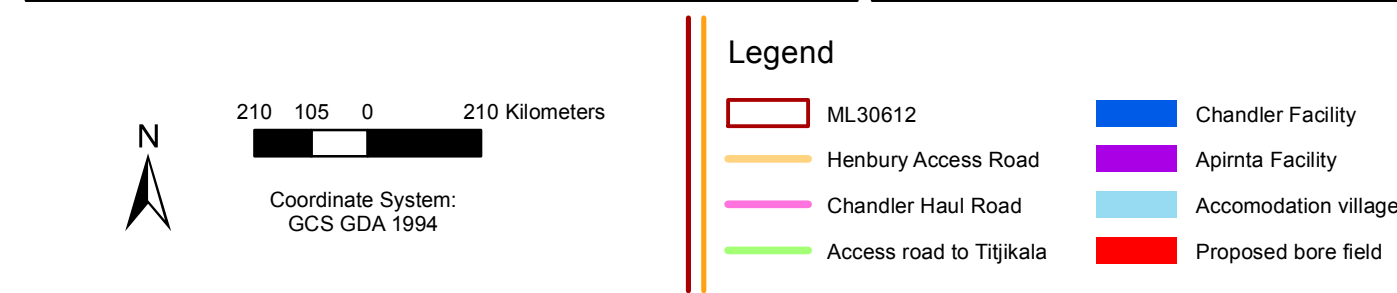


Figure 18-2
Road network in the vicinity of the Proposal



18.4.4 Assessment of risk during construction

This section discusses the increased road and rail traffic and the use of existing road and rail transportation networks during construction of the Proposal.

Road traffic and transportation

This section discusses the road traffic generated during the construction of the proposed Chandler Haul Road and Henbury Access Road. There would be minimal traffic and transportation impacts on the existing Maryvale Road, Chambers Pillar Road and the Stuart Highway during construction of the Proposal.

Maryvale Road

Site access in the initial months of construction would be via the existing Maryvale Road. Traffic volumes would be periodic due to the nature of the construction works. During peak construction periods, traffic volumes could be approximately five to 10 heavy vehicle movements per day (or one every hour on average) and 10 to 20 light vehicle movements per day (or two every hour on average).

Given the Maryvale Road already has regular *changing road surface conditions* (Territory Asset Management Services 2015), the predicted number of heavy and light vehicle numbers is not anticipated to lead to a significant deterioration of existing road surface conditions.

If approved, the Proposal may represent a significant beneficial opportunity to improve existing road surface conditions for the entire length of Maryvale Road. This could lead to significant beneficial opportunities to improve road safety for vehicle users in Titjikala and, for tourists travelling to and from Chambers Pillar Nature Reserve along Maryvale Road.

Chambers Pillar Road

Chambers Pillar Road would only be accessed for about 25 kilometres from Maryvale. The vehicle numbers during construction would be the same as Maryvale Road.

Works to a section of Chambers Pillar Road would be undertaken during construction to create a crossing where the proposed Chandler Haul Road meets Chambers Pillar Road. At the time of submitting the EIS, AADT data was not available for this section of road. However, after conducting four years of field work, average traffic numbers along Chambers Pillar are generally low (less than 100) and tend to peak in the dry months (May to September and when the Finke Desert Race occurs). Impacts to Chambers Pillar Road are considered negligible.

Chandler Haul Road

As the initial site establishment works are progressed, construction access to the proposed Apirnta Facility would be developed along an existing access track (the alignment of the proposed Chandler Haul Road).

Traffic volumes would be periodic due to the nature of the construction works. During peak periods, traffic volumes could be between five to 10 heavy vehicle movements per day (on average) and five

to 10 light vehicle movements per day (on average) during construction of the proposed Chandler Haul Road.

Henbury Access Road

As construction progresses, permanent access to the proposed Apirnta Facility would be developed along an existing access track that connects to the Stuart Highway (the alignment of the proposed Henbury Access Road). It is anticipated that construction of the Henbury Access Road would occur across two fronts, with one crew moving east from the Stuart Highway and a second crew moving west from the Apirnta Facility.

Traffic volumes would be periodic due to the nature of the construction works. During peak periods, traffic volumes could be between five to 10 heavy vehicle movements per day (on average) and 10 to 20 light vehicle movements per day (on average) during construction of the proposed Henbury Access Road.

Stuart Highway

The Stuart Highway would not be utilised for access during construction.

Rail traffic and transportation

No equipment or materials would be delivered to site via rail during construction of the Proposal. There would also be no need to rail closures during construction of the Proposal. Therefore, there would be no impact on the Central Australian Railway during construction of the Proposal.

18.4.5 Assessment of risk during operation

This section discusses the increased road and rail traffic and the use of existing road and rail transportation networks during operation of the Proposal.

Road traffic and transportation

This section discusses road traffic on the proposed Chandler Haul Road and Henbury Access Road during operation of the Proposal. There would be minimal traffic and transportation impacts on the existing Maryvale Road, Chambers Pillar Road and the Stuart Highway during operation of the Proposal.

Maryvale Road

Access via Maryvale Road would slowly be phased out during operation of the Proposal as the bulk of movements for waste deliveries would occur via rail and along the private Chandler Haul Road. There would be minimal increase in traffic volumes along Maryvale Road during operation of the Proposal.

Chambers Pillar Road

The main risks arising on Chambers Pillar Road would be vehicle collision at the intersection of the private Chandler Haul Road. Without adequate road safety measures in place, and an effective Operation Traffic Management Plan, the impact to humans is considered a high risk.

Chandler Haul Road

Once construction has been completed and commissioning and operational ramp up commences, the Chandler Haul Road would be used for the transfer of waste materials via truck from the Apirnta Facility to the Chandler Facility, and the backhaul of salt product from the Chandler Facility to the rail siding at the Apirnta Facility. Traffic volumes would likely be between 15 to 25 heavy vehicle movements and five to 10 light vehicle movements per day (on average) along the Chandler Haul Road.

Henbury Access Road

Once construction has been completed and commissioning and operational ramp up commences, long-term site access would move from Maryvale Road (used during construction) to the proposed Henbury Access Road from a new intersection with the Stuart Highway. The vast majority of waste deliveries and salt exports would be via rail, therefore, road traffic volumes would likely be low along the proposed Henbury Access Road. Traffic volumes would likely be between one to two heavy vehicle movements and two to five light vehicle movements per day (on average) along the proposed Henbury Access Road.

Stuart Highway

The Proposal assumes 90 % of all waste would be delivered to the proposed Apirnta Facility. This leaves 10 % to be delivered by road (the Stuart Highway). If this were to occur, this equates to approximately one truck per week.

Workers from Alice Springs would access the Stuart Highway to reach the proposed Henbury Access Road. The Stuart Highway is considered to have ample carrying capacity to adsorb drive-in-drive-out worker shifts per week.

Rail traffic and transportation

Based on the above average life of Proposal waste tonnage, the proponent anticipates 52 train movements per year.

18.4.6 Mitigation and monitoring

Mitigation and management measures proposed to reduce traffic impacts during construction, operation, and closure and rehabilitation of the Proposal are listed in Table 18-4. These measures would include the development of a Construction and Operation Traffic Management Plan in line with Australian Standard 1742.3. Both plans would be incorporated into the Proposal's CEMP, OEMP and RCP for the Proposal.

Table 18-6 Mitigation and management measures (traffic and transportation)

ID	Outcome	Mitigation/management measure	Timing
T.1	Minimise traffic and transportation impacts and reduce risk of vehicle collision and human collision with vehicle	Prepare and implement a Construction Traffic Management Plan in consultation with the NT Department of Transport in accordance with Australian Standard 1742.3	Pre-construction
T.2	Minimise traffic and transportation impacts	Install appropriate speed and warning signage prior to and at the crossing of Chambers Pillar Road.	Construction
T.3	Prevention of accidents between trucks hauling waste and salt along the Chandler Haul Road.	Develop a collision avoidance system for the Chandler Haul Road. Include the provision of a visible and/or audible alarm system to confirm the presence of vehicles traveling along the proposed Chandler Haul Road. Alarm system would alert drivers of haul trucks when another truck is within 500 metres, requiring a reduction in speed.	Operation
T.4	Minimise traffic and transportation impacts	Restrict speed limits to no more 60km/hr on the proposed Chandler Haul Road and Henbury Access Road. Ensure vehicles reduce speed and come to a complete stop at the crossing of Chambers Pillar Road.	Construction, operation, closure and rehabilitation
T.5	Minimise traffic and transportation impacts	Commit to workplace programs regarding road safety.	Construction, operation, closure and rehabilitation
T.6	Access to surrounding properties maintained	Maintain access to surrounding properties for the duration of the Proposal.	Construction, operation, closure and rehabilitation
T.7	Minimise traffic and transportation impacts and reduce risk of vehicle collision and human collision with vehicle	Prepare and submit to the NT Department of Transport a Construction Traffic Management Plan in accordance with Australian Standard 1742.3	Pre-construction
T.8	Understanding traffic impacts following final detailed design	The proponent would prepare a Traffic Impact Statement and submit to the NT Department of Transport.	Pre-construction.

18.4.7 Conclusion

Road traffic generated during construction and operation was modelled across the life of the Proposal. The projected traffic movements discussed above for Maryvale Road, the Stuart Highway and at the intersection of Chambers Pillar Road would require a Traffic Impact Statement. The Proposal would not require a Traffic Impact Assessment. This is because the predicted number of vehicle movements falls between 10 and 100 trips in peak traffic periods as defined by *Austroads Guide to Traffic Management Part 12 – Traffic Impacts of Development* and referenced within the NT Department of Transport *Development Guidelines for Northern Territory Government Controlled Roads*.

There would be minimal impact on the existing road network as there is enough capacity on existing roads (Maryvale Road, Stuart Highway) to accommodate the increased traffic generated during construction, operation, and closure and rehabilitation of the Proposal.

The existing Central Australian Railway network has enough capacity to accommodate the increase in rail movements during operation of the Proposal. There would also be no impact on the existing rail network during closure and rehabilitation of the Proposal.

Mitigation measures, including the preparation and implementation of a Construction and Operation Traffic Management Plan would be implemented to reduce potential impacts on road and rail traffic and transportation during construction, operation, and closure and rehabilitation of the Proposal. These measures would be incorporated into the CEMP, OEP and RCP for the Proposal.

18.5 Environmental offsets

Assessments of significance for matters of national environmental significance have been prepared for six threatened fauna species and eight migratory bird species in accordance with the *Significant Impact Guidelines 1.1-Matters of National Environmental Significance* (DoE 2013). The assessments of significance are included in Appendix R and are summarised in Chapter 7.

At present, no biodiversity offsets are deemed necessary as there would be no significant impact to matters of national environmental significance during construction, operation, or closure and rehabilitation of the Proposal.

Additional surveys would be undertaken prior to construction to confirm the presence/absence of two matters of national environmental significance (threatened species) considered to have a low to moderate likelihood of occurrence within the proposed development footprint or vicinity. These are Slater's skink (*Liopholis slateri slateri*) and the thick-billed grasswren (*Amytornis modestus indulkana*). Potential habitat for these species is located within the vicinity of the proposed Henbury Access Road.

If these species are found to be present, significant impacts would be avoided through changes to the proposed alignment of the Henbury Access Road. Alternatively, a program of trapping and relocating would be implemented to avoid significant impacts to these species. If significant impacts could not be avoided, the need to calculate and deliver biodiversity offsets would be assessed in accordance with the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy* (DSEWPac 2012b) and in consultation with the DoEE.