



10. Proposed Environmental Management Measures

This section identifies the main potential environmental risks posed by the project, and the proposed mitigation measures. Arafura Resources Limited is developing a policy to implement robust environmental management measures to safeguard against land contamination and degradation arising from its activities, to ensure there are no onsite or offsite threats to human health or the environment and that future uses of the land are not compromised. The nature and scale of risks have been determined primarily by review of existing information and past experience on similar projects. All impacts will be assessed in detail as part of the project PER/EIS.

To ensure delivery of this policy Arafura Resources strives to achieve the following objectives:

- Objective 1: Ensure the site is physically safe and does not pose a human health risk
- Objective 2. Ensure that land is left in a stable condition that minimises long-term environmental impacts
- Objective 3. Rehabilitate disturbed land such that it promotes sustainable ecosystems
- Objective 4. Endeavour to maintain stock quality water quality and where use restrictions are required, ensure appropriate notification and management is in place
- Objective 5. Establish final land use objectives which are consistent with land capacity and the surrounding social context
- Objective 6. Engage in Community/Stakeholder consultation to a degree that there is general acknowledgement that the process has been satisfactory.

Any Contractors being considered for work will be required to have appropriate Environmental Management Plans as a prequalification before being accepted.

The guideline for preparing a Notice of Intent require a description on how the project will or has the potential to impact on each element of the environment. This section outlines the methodology used to make the assessment of the impacts.

The criteria used to assess impacts are described below. Each activity of the project will identify potential impacts, and propose mitigation methods for the identified impacts.

10.1 Environmental Risk Assessment

Each impact is rated in terms of the level of severity of the potential impact (the impact rating). The key for each rating used within the impact assessment is defined in Table 14,

Table 15 and Table 17 below.





Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Extreme
Almost Certain	S	S	Н	н	Н
Likely	М	S	S	н	Н
Possible	L	М	S	н	Н
Unlikely	L	L	М	S	Н
Rare	L	L	М	S	S

Table 14 Likelihood/Consequence Matrix

Table 15Likelihood Criteria

Likelihood	Percent of Occurrence	Description for percent of Occurrence
Almost Certain	90 – 100%	Event occurs ten times a year during construction or operation
Likely	51 – 90%	Event occurs once each year during construction or operation
Possible	11 – 50%	Less than 50 % chance of event occurring each year during construction or operation
Unlikely	1 – 10%	Less than 10 % chance of event occurring each year during construction or operation
Rare	0 – 1%	Less than 1 % chance of event occurring each year during construction or operation





Consequence	Consequence Classificati	on	
	Community	Public and Workforce Safety	Environment
Extreme	Extreme negative media coverage/NTG intervention	Death or permanent incapacitation	Catastrophic site impact / high local impact / moderate external impact / serious long-term cumulative effect
Major	Significant negative media coverage / formal council intervention	Major injury / illness	High site impact / moderate local impact / minimal external impact / minor long-term cumulative effect
Moderate	Critical media coverage / formal council request for information	Lost time incident (LTI)	Moderate site impact / minimal local impact / possible long term cumulative effect
Minor	Number of community complaints above expected average	Minor injury / illness	Minimal site impact / easily controlled
Insignificant	Number of community complaints at expected average	No injury / illness	No impact

Table 16 Consequence Criteria

Table 17 Management Response Required

Rating		Response Required
Н	High	Requires further investigation and the development of specific strategies to address the issue. Should be considered as "Don't Proceed" issue unless specific strategies have been developed to bring level of risk to acceptable
S	Significant	Requires the development of specific strategies
М	Moderate	Generally requires the development of specific action plans
L	Low	Generally document and accept or manage as normal part of project management



Table 18Construction Phase Risk

Ref Number	Activity	Hazard Source	Impact	Likelihood	Consequence	Risk	Mitigation Measures	Residual Liklihood
1	Construction Vehicle Movement (general)	Leak of petrol, oil or other liquid from earth moving vehicles	Petrol, oil or other liquids entering water system or contaminating soil around mine site	Almost certain	Minor	Significant	 Spill kits Hydrocarbon spill management plan Regularly serviced vehicles Trained operators 	Possible
2		Fuel spill during refueling or incorrect onsite storage of fuel	Hydrocarbons can contaminate water bodies and soil	Possible	Minor	Moderate	 Spill kits Construction refueling and storage of fuel management plans Hydrocarbon spill management plan Staff training 	Possible
3		Noise from construction equipment	Affecting nearby workers and local flora and fauna	Possible	Minor	Minor	 Regularly serviced vehicles Well maintained equipment Construction noise management plans Staff training Community consultation plan 	Unlikely
4		Air emissions	Air emissions can contribute towards local air pollution	Likely	Insignificant	Low	 Construction air management plans Regularly serviced machinery Staff training 	Possible
5		Dust emissions from vehicle movements and other construction operations	Reduction in local air quality leading to radiation contamination from dust if inhaled to people and effects on local ecology	Almost Certain	Major	High	 Dust management plans Compliance with conditions within Development Approval Vehicular speed limits enforced Staff training Radiation management plans 	Likely
6		Consumption of fuel	Diesel is a fossil fuel. The mining and consumption of fossil fuels contribute to global warming	Almost Certain	Insignificant	Low	 Use vehicles that are regularly serviced Staff training 	Unlikely
7		Increased traffic on surrounding roads during construction	Impacts to tourists and other road users affected by increased traffic	Likely	Moderate	Significant	 Traffic management plans Community consultation and awareness program Trained staff 	Possible



Residual Consequence	Residual Risk
Minor	Moderate
Minor	Moderate
Insignificant-Minor	Low
Insignificant-Minor	Low-Moderate
Insignificant	Moderate
Insignificant-Minor	Low
Insignificant-Minor	Low-Moderate



Ref Number	Activity	Hazard Source	Impact	Likelihood	Consequence	Risk	Mitigation Measures	Residual Liklihood
8		Crash between construction vehicle and another road vehicle	Sustained injury or death to one or more of the drivers/passengers	Rare	Extreme	Significant	 Traffic management plans Community consultation and awareness program Staff training Licensed drivers Emergency response plan 	Rare
9	General Construction	Loss of containment of spoil from trucks	Spoil loss during truck movements may cause air quality degradation (radiation) and loss of resource	Likely	Moderate	Significant	 Dust management plans Conditions within Development Approval Radiation management plan 	Unlikely
10		Cultural heritage	Disturbance of cultural heritage items or places	Possible	Moderate- Major	Significant- High	 Construction heritage management plans Heritage site investigations Clearly defined areas Trained staff 	Rare
11		Project Employment	Increased employment and generation of income	Almost certain	Positive	N/A	 Employment and training programs 	N/A
12		Fuel or chemical spill	Fire causing habitat loss or pollution	Possible	Moderate	Significant	 Spill kits Trained staff Emergency response plans Hydrocarbon spill management plan Construction environmental management plans 	Unlikely
13		Fuel or chemical spill	Fire causing death or injury to personnel	Possible	Extreme	High	 Spill kits Trained staff Hydrocarbon spill management plan Emergency response plans Construction environmental management plans 	Rare
14		Fuel or chemical spill	Fire causing damage to infrastructure	Possible	Major	High	 Spill kits Trained staff Emergency response plans Hydrocarbon spill management plan Construction environmental management plans 	Rare



Residual Consequence	Residual Risk
Extreme	Significant
Minor	Low
Moderate-Major	Moderate-Significant
Moderate	Moderate
Extreme	Significant
Moderate	Moderate



Ref Number	Activity	Hazard Source	Impact	Likelihood	Consequence	Risk	Mitigation Measures	Residual Liklihood
15	Construction alongside Aileron Roadhouse and Aileron Homestead	Disturbance (limited access) to commercial area	Loss of business, limited access and general inconvenience	Likely	Moderate	Significant	 Traffic management plans Community consultation Construction panning (hours of operation) 	Unlikely
16	Waste Management	Fuels and oils not stored correctly	Contamination of soil and groundwater	Likely	Moderate	Significant	 Spill kits Trained staff Emergency response plans Hydrocarbon spill management plan Construction environmental management plans 	Unlikely
17		Gereral construction waste not properly disposed of	Impacts to local fauna	Unlikely	Minor	Low	 Construction environmental management plans Waste disposal strategy 	Rare
18	Removal of Vegetation	Removal or damage to terrestrial vegetation	Vegetation impacted causing damage to local ecology and causing project delays	Likely	Moderate	Significant	 Ecological site investigations Obtaining correct approvals Construction environment management plans Minimal vegetation to be cleared Trained staff 	Unlikely
19		Removal or damage to terrestrial vegetation	Habitat loss or fragmentation impacting on threatened fauna	Possible	Moderate	Significant	 Ecological site investigations Obtaining correct approvals Construction environment management plans Trained staff Minimise disturbance and access to key areas Avoidance of riparian zones Implement appropriate habitat buffer zones 	Unlikely
20		Clearing or vehicular movement through weed colonized areas	Spread of weeds and potential to increase local area fuel loads	Almost certain	Moderate	Significant	 Construction weed management plan Site weed investigations Washdown areas Staff training 	Unlikely



Residual Consequence	Residual Risk
Insignificant	Low
Minor	Low
Minor	Low
Moderate	Moderate
Moderate	Moderate
Moderate	Moderate



Ref Number	Activity	Hazard Source	Impact	Likelihood	Consequence	Risk	Mitigation Measures	Residual Liklihood
21	Excavation of soil at water crossings	Disturbance of banks causing erosion and sediment runoff	Disturbance of diversion channels and subsequent impact to aquatic habitat	Likely	Moderate	Significant	 Trained Staff Erosion and sediment control management plans Sediment erodibility investigations 	Possible
22		Stockpiles of spoil stored on construction site	Erosion of stockpiles of spoil leading to loss of soil and potential impact on local water bodies (increased sedimentation and radiation)	Likely	Moderate	Significant	 Trained Staff Erosion and sediment control management plans Radiation management plan 	Unlikely
23		Heavy rain event	Erosion and sediment runoff affecting water quality affecting turbidity and increased radiation levels, potentially affecting aquatic ecology	Possible	Moderate	Significant	 Trained Staff Erosion and sediment control management plans Radiation management plan Sediment erodibility investigations Provision of temporary drains and catch drains, silt traps and other diversion measures 	Unlikely
24	Landform Disturbance	Diversion of creek	Erosion and sediment runoff affecting water quality affecting turbidity and increased radiation levels, potentially affecting aquatic ecology	Possible	Moderate	Significant	 Trained Staff Erosion and sediment control management plans Radiation management plan Sediment erodibility investigations Provision of temporary drains and catch drains, silt traps and other diversion measures 	Unlikely
25	Natural Event	Earthquake	Earthquake causing death or injury to personnel	Rare	Extreme	Significant	 Emergency response plan Trained staff Construction management plans 	Rare
26		Earthquake	Damage to infrastructure	Rare	Extreme	Significant	 Emergency response plan Remedial protection works Trained staff Construction management plans 	Rare



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Residual Consequence	Residual Risk
Moderate	Significant
Moderate	Moderate
Moderate	Moderate
Moderate	Moderate
Extreme	Significant
Extreme	Significant



Table 19 Operation Phase Risk

Ref Number	Activity	Hazard Source	Impact	Likelihood	Consequence	Risk	Mitigation Measures	Residual Likelihood	Residual Consequence	Residual Risk
Road and Service Corridors										
27	General Operations	Loss of containment in pipeline offtake from interference causing catastrophic failure	Large volumes of gas escaping from pipeline causing damage to other infrastructure	Unlikely	Major	Significant	 Leak detection system Regular inspections Operational management plans Emergency response plans Trained staff 	Rare	Major	Significant
28		Slow leak from corrosion in pipe offtake	Gas from pipe potentially a fire risk	Unlikely	Major	Significant	 Leak detection system Regular inspections Operational management plans Emergency response plans Trained staff 	Rare	Major	Significant
29		Acts of terrorism/vandalism to pipeline	Range of impacts including loss of production, explosion	Rare	Extreme	Significant	 Limited access Regular inspections Security measures Emergency response plans 	Rare	Extreme	Significant
30	Procurement of Materials	Lifecycle of materials used for construction of gas pipeline offtake not appropriate	Life of gas pipeline offtake is brought forward due to a number of leaks and costly repairs caused by degrading pipe	Likely	Major	High	Procurement planMaterials fit-for-purpose	Unlikely	Moderate	Moderate
31		Limited lifespan of construction materials for roads in climatic conditions	Regular maintenance and repairs	Likely	Minor	Significant	 Regular inspections Operational management plans Materials fit-for-purpose 	Unlikely	Minor	Low
32	Vehicle Movement	Air emissions	Air emissions can contribute to local air pollution	Almost certain	Minor	Significant	 Air quality management plans Regularly serviced vehicles Staff training 	Possible	Minor	Moderate
33		Consumption of fuel	Diesel is a fossil fuel. The mining and consumption of fossil fuels contribute to global warming	Almost certain	Minor	Low	Regularly serviced vehiclesStaff training	Unlikely	Insignificant-Minor	Low





									A K A F U K A RESOURCES LIMITED		
Ref Number	Activity	Hazard Source	Impact	Likelihood	Consequence	Risk	Mitigation Measures	Residual Likelihood	Residual Consequence	Residual Risk	
34		Increased traffic on surrounding roads during operation Impacts to tourists and other road users affected by increased traffic	Likely	Moderate	Significant	 Traffic management plans 	Possible	Insignificant-Minor	Low-Moderate		
			other road users affected by increased traffic				 Community consultation and awareness program 				
						 Trained staff 					
35		Crash between operational-use vehicle and another road vehicle	Sustained injury or	Rare	Extreme	Significant	Traffic management plans	Rare	Extreme	Significant	
			death to one or more of the drivers/passengers				 Community consultation and awareness program 				
							 Staff training 				
							 Licensed drivers 				
							 Emergency response plan 				
36		Spillage of chemical during transportation to site due to crash or incorrect transportation	I Impacts could vary. n Worst case would be or thorium containing residue spill causing injury or death to a member of the public, through radiation	Possible	Minor-Extreme	Significant- High	Site-based management planDevelopment Approval conditions	Rare	Extreme	Significant	
							 Chemicals stored according to MSDS and radiation requirements 				
							 Radiation management plan 				
						 Hydrocarbon spill management plan 					
							 Staff training 				
Mine Site											
37	General Operation Spillage/leak of chemicals due to incorrect storage	Spillage/leak of chemicals due to	k of Impacts from leaking lue to chemicals could cause orage a number of impacts, from low risk health concerns to a major explosion causing death to one or more persons	Rare	Extreme	Significant	 Site-based management plan 	Rare	Extreme	Significant	
							 Development Approval conditions 				
							 Chemicals stored according to MSDS requirements 				
							 Staff training 				
38		Spillage of chemical	Impacts could vary.	Possible	Minor	Significant-	 Site-based management plan 	Unlikely	Minor	Low	
		during transportation to site due to crash or	uring transportationWorst case would beb site due to crash orspills of diesel causingb correctfire or explosion, orcansportationcontamination of soil			High	 Development Approval conditions 				
		incorrect transportation					 Chemicals stored according to MSDS requirements 				
							 Hydrocarbon spill management plan 				
							 Staff training 				
39		Acts of	Damage to equipment	Rare	Extreme	Significant	Site security	Rare	Extreme	Significant	
		terrorism/vandalism	ndalism causing explosions or				Emergency response plan				
	c ii c	chemicals causing injury or death to one or more staff				 Staff training 					





Ref Number	Activity	Hazard Source	Impact	Likelihood	Consequence	Risk	Mitigation Measures	Residual Likelihood	Residual Consequence	Residual Risk
40		Fuel/oil spill (backup generator)	Potential contamination to soil and groundwater	Possible	Moderate	Significant	 Operational management plans Appropriate bunding for generator Hydrocarbon spill management plan 	Unlikely	Minor	Low
41		Fire in plant areas	Plant fails due to overflow of fuel/chemicals	Rare	Major	Significant	 Operational management plans Emergency response plans Trained staff Fire fighting equipment 	Rare	Major	Significant
42		Heavy rain event	Erosion and sediment runoff affecting water quality affecting turbidity and increased radiation levels, potentially affecting aquatic ecology	Possible	Moderate	Significant	 Trained Staff Erosion and sediment control management plans 	Unlikely	Moderate	Moderate
43	Waste Management	Slow leak from corrosion in septic/sewage pipes	Effluent from pipes potentially contaminating soil or groundwater	Unlikely	Minor	Low	 Leak detection system Regular inspections Operational management plans Emergency response plans Trained staff 	Rare	Minor	Low
44	Water Management	Infiltration from pit	Substances potentially contaminating soil or groundwater.	Likely	Moderate	Significant	 Leak detection system Regular inspections Operational management plans Groundwater quality management plan Emergency response plans Trained staff 	Unlikely	Moderate	Moderate
45	Vehicle Movement	Air emissions	Air emissions can contribute to local air pollution	Almost certain	Minor	Significant	 Air quality management plans Regularly serviced vehicles Staff training 	Possible	Minor	Moderate
46		Consumption of fuel	Diesel is a fossil fuel. The mining and consumption of fossil fuels contribute to global warming	Almost certain	Minor	Low	Regularly serviced vehiclesStaff training	Unlikely	Insignificant-Minor	Low





Ref Number	Activity	Hazard Source	Impact	Likelihood	Consequence	Risk	Mitigation Measures	Residual Likelihood	Residual Consequence	Residual Risk
47		Increased traffic on	Impact to tourists and	Likely	Moderate	Significant	 Traffic management plans 	Possible	Insignificant-Minor	Low-Moderate
	surrounding roads during operation	other road users affected by increased traffic				 Community consultation and awareness program 				
							 Trained staff 			
48		Crash between	Sustained injury or	Rare	Extreme	Significant	Traffic management plans	Rare	Extreme	Significant
	operational-use vehicle and another road vehicle	operational-use vehicle and another road vehicle	death to one or more of the drivers/passengers				 Community consultation and awareness program 			
							 Staff training 			
							 Licensed drivers 			
						 Emergency response plan 				
49	Natural Event Earthquake	Earthquake	Earthquake causing injury or death to personnel	Rare	Extreme	Significant	 Emergency response plan 	Rare	Extreme	Significant
							 Trained staff 			
		F				 Construction management plans 				
50	Earthquake Damage to infrastructure	Damage to	Rare	Extreme	Significant	 Emergency response plan 	Rare	Extreme	Significant	
			infrastructure				 Remedial protection works 			
						 Trained staff 				
							 Construction management plans 			
51		Severe hailstorm	Damage to infrastructure	Rare	Extreme	Significant	 Emergency response plan 	Rare	Extreme	Significant
	event	event					 Remedial protection works 			
							 Trained staff 			
							 Construction management plans 			

Table 20 below illustrates the assumed residual risk for the project, with the reference numbers from Table 18and Table 19 placed in the relevant risk areas.







Table 20	Residual Likelihood/Consequence Matrix

Residual Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Extreme
Almost Certain	S	S	Н	н	Н
Likely	M (5)	S	S	<u>н</u>	<u>н</u>
Possible	L (4,7,34,47)	M (1,2,32,45)	S (21)	Н	Η
Unlikely	L (3,6,15,33,46)	L (9,16,31,38,40)	M (12,18,19,20,22,23,24 ,30,42,44)	S	Н
Rare	L	L (17,43)	M (10,14)	S (27,28,41)	S (8,13,25,26,29,35,36, 37,39,48,49,50,51)





10.2 Environmental Management Plan

An Environmental Management Plan (EMP) will be written for the project using the Victorian Safety Case process framework. This will cover design, construction and operational phases of the project. The following sections outline some of the potential issues to be incorporated into an EMP. The EMP will also detail the monitoring regime that will be implemented once all studies are completed. All sections below are subject to the requirements of the Radiation Management Plan (Section 11).

10.2.1 Noise and Vibration

The mine operations are located in a remote region of the Northern Territory, with the nearest sensitive receptor (the Aileron Roadhouse) located approximately 13km away from the site. Construction of the camp infrastructure may be at or near the Aileron Roadhouse. Other camp options are remote from any sensitive receptors. Mine operational hours have not yet been decided. Specific management measures for noise abatement will be developed if required should night operations be used in the future.

Construction noise for both the camp and mine sites will only be short term. It is is unlikely that noise nusciance from mining and benifitiation activites will be a consideration post construction given the attenuation by distance of communities from the mining operation.

10.2.2 Soil Erosion

The movement of vehicles on and offsite can carry materials and sediment off site allowing contaminants to be washed into waterways or sediment build-up outside the site to occur.

Heavy rainfall during construction activities can carry exposed soils and construction materials into the stormwater drainage system and water systems surrounding the site. Site earthworks will be required in the construction of the mine site and associated infrastructure. Vehicle movements will be kept to a minimum after rainfall events to minimise potential erosion of soils.

Erosion of soil by wind is likely to occur in this region, and a Sediment and Erosion Control Plan will be implemented.

Some of the material excavated during construction will be used for bunds and tailings ponds.

Creating a diversion to the creek may have the potential for soil erosion, and downstream deposition. During the design considerations for the diversion channel the geometry and dimensions of the diversion channel will be carefully considered. This should avoid erosion issues in the short, medium or long-term and ensure minimal impacts to aquatic ecological habitat and value of this drainage feature.

10.2.3 Ecological Impacts

The mine development has the potential to impact on the environment in a variety of ways, through construction to operation and maintenance. This may include vegetation removal and habitat fragmentation impacting the sites biodiversity (including threatened flora and fauna species) although none have been identified by surveys to date. This can occur through excavation causing soil erosion, and excess runoff and disturbance. The proposed Environmental Management Plan will be consider all phases of the project, ensure plans are in place and that staff and contractors are appropriately trained and aware of the site environmental management requirements. Vegetation clearing of the site and access tracks will be minimised to reduce for the chances of opportunistic weedy species that have been





noted from the area surrounding the mine site invading. As the area was previously used for pastoral purposes, there are few concerns that clearing for this mine development will create any displacement of well-established local native flora and fauna.

The area will be subject to land management procedures, including weed management and firebreak control. The surrounding environment is reflected throughout most of Aileron region and surrounding pastoral leases. The likelihood of the project area being of significant importance to a threatened species (floral or faunal) is minimal however consideration to these potential species will be given in the management plan. Protocols will be in place to control all activities both pre and post construction.

10.2.4 Air Pollution

Greenhouse gases will be produced as part of this project. It is unlikely specific greenhouse gas monitoring or reporting will be required other than currently required by Commonwealth legislation. Energy efficiencies' will be considered in the design and operational processes.

An Air Quality Management Plan will be implemented to minimise impacts to local air quality.

10.2.5 Natural Events

Natural events such as earthquakes, fierce storms including hailstorms, and other Acts of God cannot be avoided. Their impacts can be managed by implementation of appropriate emergency and management plans, and by appropriate engineering design. Staff will be trained to respond to a variety of emergency situations.

10.2.6 Heritage

There is potential for artefacts to be uncovered during the duration of the project, especially during initial site preparation activities. Arafura Resources commissioned an archaeological survey of the proposed mine site area which indicated items and areas of significance within the designated development area. Additional surveys are required on areas off lease.

A Heritage Management Plan will be implemented which will include appropriate management protocols.

10.2.7 Water Management

There are two aspects to be considered by this project, surface and groundwater. Both of these will be included in the environmental manegment plan for the operation.

The main surface water management issues include:

- Excess runoff from the upslope areas of the catchment into Kerosene Camp Creek and through or around the mine site affecting water quality;
- Lack of defined flow paths across low lying flats;
- The lack of isolation between the surrounding catchment area and the mine site;
- The gully running through the main areas of the pit and MIA; and

The development of a Surface Water Management Plan will involve establishing the mine site's needs. The plan will be integrated across the whole mine site and will involve:

Identification of existing surface water management structures;





- Identification of good industry practice surface water management options;
- Assessment of current water courses and potential diversions;
- Analysis of catchment topography and earthworks required to ensure surface water containment within the mine site;
- Analysis of water storage requirements for disposal or evaporation.

By following this approach in developing the plan, the following outcomes can be achieved:

- Prioritise options to alleviate the impact of surface water movement through the mine site; and
- Determine the earthwork requirements to implement the surface water management system.

The main groundwater management issues include:

- Monitor and minimise impacts of the local mine aquifer systems to protect beneficial use.
- Protect the Ti Tree basin groundwater resources
- Use groundwater efficiently to minimise site water usage, maximise recycle.

10.2.8 Hydrocarbons & Chemicals Management

Hydrocarbon and chemicals will be managed on site in accordance with appropriate Australian Standards. A specific management plan will be written as part of the overall environemental management plan. The basic philosophy of the plan would include:

- *Control:* If safe to do so, control the spill and safeguard human life and the environment (including placing bunding around stormwater drains if necessary);
- Contain: Prevent the spill from entering drains or unsealed roads and contain the spill utilizing absorbent booms or sand banks to prevent further impact on the environment;
- Clean Up: Soak up as much of the spill as practicable and place clean up materials in suitable plastic bags or drums. Remove material protecting drains and unsealed areas and dispose of appropriately if contaminated; and
- *Report*: all spills to the Mine Manager as soon as possible. Each incident will be documented by completion of an Incident Notification form.

10.2.9 General Waste

Construction and operating wastes generated from the project would be typical of waste streams generated from most major industrial construction projects and are likely to include:

- Scrap metal from plant assembly and construction activities;
- Scrap timber;
- Packaging materials;
- Concrete asphalt and solid fill (including excess soil that cannot be reused within the site);
- Plant material generated during site clearing;
- Grease, oils and fuels;





- Paint materials;
- Green wastes from vegetation removal; and
- Kitchen and office refuse.

The volume and types of waste will vary throughout the project depending on the activities occurring. A Waste Management Plan will be written prior to construction.

10.2.10 Waste Rock, Beneficiation Plant Tailings and Process Waste

Detailed chemical characterisation and physical studies will be required for the mine and process wastes to determine the most appropriate surface or near-surface disposal methods.

An operational Waste Management Plan will be implemented incorporating waste rock, tailings and process waste once appropriate studies are completed and methodoligies selected.

10.2.11 Transportation, Handling and Storage of Hazardous Goods

A variety of hazardous goods and substances will be required at various stages of construction, operation and maintenance of the project. Transportation will require the correct permits and licences, and compliance with the requirements of the relevant Acts.

All hazardous goods and substances will be handled and stored in accordance with Australian Standards and in accordance with specifics that may be contained in MSDS documentation. Staff will be trained in the correct procedures for transporting, handling and storing such goods, as appropriate. A Hazards, Dangerous Goods and Risk Management Plan will be developed to minimise hazards and risks to personnel and the public.

10.2.12 Vehicle Movements

The construction and operational phases of the project requires an increase in the number of vehicles, particularly heavy vehicles, using roads used by the general public. The increased traffic volume may cause aggravation to other roads users, degrade air quality and increase road degradation. Traffic Management Plans, community consultation and awareness programs will be implemented as appropriate. Speed limits on roads constructed for the project will be implemented to reduce identified impacts. Vehicles will be serviced and well maintained to reduce air emissions, noise and potential environmental impacts. Staff training will be provided including appropriate licences.

These plans and programs will be implemented for the construction and operational phases of the project.

10.2.13 Social Impact

A draft Social Impact Assessment methodology has been written, and will be tailored to cover the requirements as recommended as part of the Environmental Assessment Process.

10.2.14 Economic Impacts

ACIL Tasman is completing an Economic Impact Study for the project. Results and proposed mitigation measures will be provided as part of the Environmental Assessment Process.





11. Radiation Management

11.1 Radiation Monitoring Plan

The relevant regulatory authority within the Northern Territory has approved the current Radiation Management Plan for management of occupational and environmental radiation exposures at Nolans covering all aspects of activities currently being done on site. This plan meets the requirements set by the Commonwealth Government. This plan will be built upon and further approval sought once all aspects of the mining and processing plant are fully understood. The plan when finalised will be in accordance with the Codes of Practice for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing (ARPANSA, 2005⁶) and Safe Transport of Radioactive Material (ARPANSA, 2001⁷) (assuming wastes produced and materials for transport are classified as radioactive materials in accordance with the Codes):

- Radiation Management Plan operational occupational and environmental exposures;
- Radiation Waste Management Plan mining wastes including tailings; and
- Radiation Protection Program for the transport of radioactive materials (e.g. thorium containing residue).

In practical terms it is intended that the plan will be intergrated into one operational document meeting the requirements above.

It is intended Arafura will consult with the relevant regulatory agencies regarding such arrangements and the application of specific radiation management requirements. The plan will also document responsibilities and actions for monitoring, management and reporting of radiation management outcomes and data be summarised in one simple table to aid implementation.

A discussion of the general requirements of each component of the Plan or Programme requirement follows.

11.1.1 Radiation Management Plan

Prior to approving operations to which the Code (ARPANSA, 2005) applies, the relevant regulatory authority must approve the Radiation Management Plan (RMP). The RMP must address the following objectives of the Code and must consider best available technology and potential dose delivery pathways.

Code Objectives

"...provide a framework in which to manage the protection of workers, members of the public and the environment from harmful effects of radiation exposures arising form mining or mineral processing and from the waste resulting from these activities both now and in the future."

The RMP must include:

• A description of the operation to which it applies;

⁶ ARPANSA (2005) Code of practice and Safety Guide Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing, Australian Radiation Protection and Nuclear Safety Agency, Australian Government, August 2005.

⁷ ARPANSA (2001) Code of practice Safe Transport of Radioactive Material, Australian Radiation Protection and Nuclear Safety Agency, Australian Government, 2001.





- Exposure control measures for employees and members of the public;
- Demonstrated access to appropriate professional expertise in radiation protection;
- A radiation monitoring and assessment program for employee dosage;
- Details of appropriate resources equipment, facilities, staffing and procedures;
- Description of induction and training courses;
- Documentation and reporting;
- Response plans to radiation incidents, accidents and emergencies; and
- A systematic review process to assess the effectiveness of the proposed measure in meeting the objectives of the RMP, and to support a process of continual improvement.

11.1.2 Radiation Waste Management Plan

The RWMP shall include:

- A description of the waste generated and the process which generates the waste;
- A description of the environment into which the waste is to be discharged including baseline radiological characteristics;
- A description of the proposed system of waste management including procedures and facilities involved in the handling, treatment, storage and disposal of the waste;
- Prediction of radiation doses and environmental radionuclide concentrations due to the proposed system of waste management, and demonstration that the regulatory protection requirements of the Code will be met;
- A radiation monitoring and assessment program for public dosage and radionuclides into the environment from the proposed waste management practices;
- Response plan for accidental and/or uncontrolled release;
- A reporting schedule for the operation of the plan and results generated by the proposed monitoring and management regimes;
- A decommissioning and rehabilitation plan for waste management facilities, and;
- A systematic review process to assess the effectiveness of the proposed measure in meeting the objectives of the RMP, and to support a process of continual improvement.

11.1.3 Radiation Protection Program/ Transport Management Plan

The TMP shall cover the following:

- Employee training;
- Structured and systematic approach to minimise exposure, which considers interactions between transport and other mine activities;
- Special work patterns, monitoring and dose assessment in accordance with paragraph 305 of Section A of the Code (ARPANSA 2001);
- Segregation of radioactive materials form workers and members of the public;





- Emergency response; and
- The TMP will consider the requirements of the Australian Code for the Transport of Dangerous Goods by Road and Rail, 6th Edition, 1998 (ADG Code).





12. Proposed Rehabilitation and Closure

Throughout all stages of the project Arafura Resources proposes to enforce stringent application of Environmental Management Plans to minimise no long-term impacts to the area.

Wherever possible, concurrent rehabilitation programs will be included in the mining and operational activities at the mine. The open pit will remain, but will be rehabilitated as a final void to protect the safety of the community. Waste rock and tailings areas will be rehabilitated as raised areas with appropriate contour profiling and covers to minimise erosion by surface water and wind. Vegetation will be established on these landforms tro provide stability and habitat. A rehabilitation plan will be included as part the requirements under the *Mining Management Act*, and in consultation with the relevant stakeholders. A detailed closure plan will also be written once operational details and environmental studies are completed, fully assessed and understood.





13. Proposed Consultation

13.1 Community relations

Arafura's relationship with the communities in which it operates is an important component of the company's business strategy. Arafura's reputation as a valued corporate citizen has been achieved by working closely with its neighbours and supporting the local community.

Arafura is committed to building on this reputation by ensuring it leaves a legacy of social and economic benefits, including employment and training of Indigenous people and maximising its sourcing of staff, supplies and equipment from the region in which it operates.

Arafura's goal is to establish community partnerships based on:

- Open and meaningful communication;
- Participation in community activities;
- Support for community initiatives;
- Effective response to community concerns; and
- Respect for Indigenous culture and aspirations.

13.2 Indigenous

Arafura will collaborate with Indigenous communities to identify and protect areas of cultural significance. It will consult with traditional owners and land councils about the company's current and planned activities. This ensures Arafura respects the connections of Aboriginal people with their land and any sites of significance.

Arafura has committed to:

- Respect the rights of traditional owners;
- Establish and maintain positive, effective and meaningful communication;
- Consult with the people whose country may be impacted by Arafura's activities;
- Engage with relevant Indigenous groups on sustainable community projects;
- Carry out surveys at proposed exploration and operational areas to assess cultural heritage and develop strategies to avoid impact on significant Indigenous sites and cultural places; and
- Develop and implement cross-cultural awareness programs for staff in conjunction with local traditional owners.

13.3 Stakeholder consultation

Arafura Resources' community consultation strategy is based on ensuring open and transparent sharing of information and community acceptance of its operations, or a 'social licence to operate'.

Arafura has developed a stakeholder matrix and begun consultation with key stakeholders such as Australian and Northern Territory Government departments, land councils, Alice Springs Town Council and traditional owners. Potential stakeholders identified include:





- Traditional Owners (TOs) and/or Native Title Holders (NTH)8;
- Central Land Council (CLC);
- Aboriginal Areas Protection Authority (AAPA);
- Pastoralists;
- Aileron Roadhouse;
- Anmatjere Community Government Council and associated outstations
 - Township of Ti-Tree
 - Alyuen (on Aileron Station)
 - Anyungunba (on Pine Hill Station)
 - Engawala (on Alcoota Station)
 - Laramba (on Napperby Station)
 - Nturiya (the western part of Ti-Tree station)
 - Pmara Jutunta (the central part of Ti-Tree station)
 - Wilora (on Stirling Station)
 - Woolla (Adelaide Bore and the eastern part of Ti-Tree Station)
 - Yanginj (on Anningie Station);
 - Neighbouring pastoral stations
 - Alcoota Station
 - Napperby Station
 - Ti-Tree Station
 - Stirling Station
 - Anningie Station;
- Other aquifer users (to be determined);
- Arid Lands and Environment Centre (ALEC);
- Alice Springs Town Council (ASTC);
- Alice Springs Chamber of Commerce (ASCC);
- Tennant Creek/Barkley;
- Desert Knowledge Australia (DKA);
- Centre for Appropriate Technology (CAT);
- Desert Knowledge Cooperative Research Centre (DKCRC);
- Charles Darwin University (CDU);
- Northern Territory Government (NTG) in Alice Springs;
- Central Australian Tourism Industry Association (CATIA);
- Other mines in the Central Australian Region;

⁸ Native title has not been determined, however there may be a native title claim over the area.





- General Community;
- Road users;
- Alice Springs Media; and
- Other stakeholders as identified by DPIFM and the EPA.

A comprehensive community consultation program will start once the Notice of Intent is lodged, including meetings, information kits, site visits for traditional owners, and opportunities for people to provide feedback. The aim of the consultation strategy is to ensure people have comprehensive information on the project and that Arafura listens to and understands the concerns of all stakeholders, explains all impacts of its activities and demonstrates how they will be managed.

Key issues to be covered include:

- Management of radiation issues;
- Uranium;
- Impacts of mining on ground and surface water;
- Transport of radioactive materials;
- Local employment and economic benefits;
- Impacts of additional traffic;
- Creek diversion;
- Location of any sites of significance;
- Impacts on endangered species;
- Access for traditional owners to their land;
- Compatibility with other land uses, such as cattle and Ti Tree's horticultural industry;
- Economic and social impacts;
- Benefits of the project; and
- Location of a process plant.

A community benefits strategy, Indigenous Employment Strategy, and community commitments will be developed as part of the community consultation strategy.

Arafura Resources has given a commitment to traditional owners, through the Central Land Council, to provide advance notice of any significant exploration, survey or bulk sampling activity at any of its Central Australian sites, including Nolans.