Environmental Management Plan

Cleanaway Operations Pty Ltd

Site Location:

875 Stuart Highway, Holtze NT 0835

Registered Address:

4/441 St Kilda Road, Melbourne VIC 3004

Document Tracking

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1 Introduction

1.1 Site Overview and Background Information

This document forms the Environmental Management Plan (EMP) for the Holtze waste transfer facility operated by Cleanaway Waste Management Limited (Cleanaway). The Holtze waste depot is located approximately 22km south east of Darwin in the local government area of Litchfield Council, within the light industrial estate of Holtze. Key site details are summarised in Table 1-1.

The site is a rectangular land parcel, approximately 30,000 m². The surrounding Holtze industrial precinct largely accommodates commercial and industrial land use including car sales, mechanical workshops, panel beating, a stonemasonry, a tertiary education centre and other waste transfer stations. Surrounding land uses are summarised in Table 1-2.

The Holtze depot resides within the Howard River Catchment area of Darwin, approximately 3km north east of Hudson Creek. Local topography and drainage has a north easterly aspect, with flow events reporting to a seasonally inundated depression approximately 80m north east of the site. Groundwater monitoring observations indicate contours follow a similar northerly direction.

The primary licenced activities including the collection, transport and storage of liquid (bulk and packaged) and solid wastes, which are then diverted to resource recovery, treatment and/or disposal processes. A description of the waste handling and storage processes for major waste streams is provided in Section 2.

Table 1-1 Site Details

Site Location	875 Stuart Highway, Holtze, Northern Territory		
Site Activities	Activities on site include waste sorting and resource recovery, prior to removal of all materials offsite. There is no on-site disposal or treatment of wastes.		
Environmental	The Northern Territory Environment Protection Authority (NT EPA) issued Environmental		
Protection Licence	 Protection Licence 254 (the Licence). The Site is licenced for the following scheduled activity: Collecting, transporting, storing, re-cycling, treating or disposing of a listed waste (as per Table 1 of the Licence) on a commercial or fee for service basis, other than in or for the purpose of a sewage treatment plant. The current licence was issued on 30 August 2019 and is due to expire on 29 August 2022. 		
Council	Litchfield Council		

Table 1-2 Surrounding Land Use

Direction from Site	Land Use/ Features
North	A service road runs directly adjacent the northern site boundary followed by a reserve.
East	Commercial/ industrial land use.
South	Stuart Highway runs directly adjacent the southern site boundary followed by commercial/industrial land use.
West	Commercial/ Industrial land use.

1.2 Purpose of the Environmental Management Plan

The purpose of this document is to provide information about site operations and outline the management procedures required to mitigate adverse impacts on the environment and, where relevant, protect environmental resources. This is achieved by undertaking an environmental risk assessment of site operations and identifying associated environmental controls and maintenance requirements. This EMP aims to provide management protocols to protect the environment during site works.

The EMP addresses Cleanaway's commitments and requirements in accordance with the Licence and the company's accreditation under ISO 14001.

1.3 Relevant Legislation

This EMP has been prepared with reference to the following legislation and guidelines:

- Environmental Assessment Act 1982
- Waste Management and Pollution Control Act 1998
- Northern Territory Environment Protection Authority (2015) *Guideline for the Preparation of an Environmental Management Plan*
- The National Environment Protection (Assessment of Site Contamination) Measure (ASC NEPM 1999, as amended 2013).

2 Operational Control and Supervision

2.1 Personnel and Responsibility

Although all employees and contractors are responsible for understanding and implementing the actions and principles of the EMP, it is essential that an appropriate person be responsible for the implementation and management of this EMP through the appointment of an EMP Manager.

The site-based Operations Manager oversees daily operations including fleet and plant, with support from the workshop supervisor, sales staff and health, safety and environmental support services. Activities which have the potential to cause environmental impacts are outlined in the appended Environmental Risk Register, along with controls and risk ratings. The controls and performance monitoring criteria are described in the sections below.

Training requirements of all staff are assessed to ensure work can be complete safely, to control potential impacts to people and the surrounding environment. A training register is maintained by the operations manager, with support from a qualified trainer-assessor along with the broader health, safety and environment (HSE) team. Training includes company inductions, verifications of competency and regular feedback at team meetings to review HSE concerns.

Table	2_1	Lict	of Da	hatele	Contacts	
Table	/-1	1181	OI RE	าเลเ ยด	Contacts	

Role	Name	Contact Number	Contact Email
EMP Manager	Angela Maisey	08 8935 1126	Angela.Maisey@cleanaway.com.au
Branch Manager	Mark Anderton	08 8997 5204	Mark.Anderton@cleanaway.com.au

2.2 Security

The area is secured with 1.8m high mesh fencing, with a single controlled entrance from Stuart Highway. The site is secured outside of operational hours, to prevent unauthorised access.

2.3 Waste Receipt and Storage

Prior to accepting wastes or providing waste collection services to customers, all wastes are identified. If customers are not able to identify a waste type, Cleanaway complete a waste classification process, to ensure the waste can be safely handled, stored and transported to an appropriately licenced facility for further treatment, recovery or disposal. Once wastes are classified, the operations manager confirms whether the waste can be accepted under EPL 254, and provides advice to the sales team. All waste types which are not authorised to be stored by EPL 254 are transported to an appropriately licenced facility. In the event that Cleanaway identifies benefits for expanding the list of licenced wastes for collection, transport and storage, the operations manager will liaise directly with NT EPA and complete the appropriate application, to allow NT EPA to review the environmental risk management strategy and provide formal response.

Prior to the collection of listed wastes, drivers are provided with a waste manifest and a run sheet. Upon arrival at site, drivers inspect the waste to ensure it reflects the details recorded on the run sheet, and inspect the waste receptacles to ensure they are fit for transport and storage.

Upon arrival at the depot, vehicles transporting waste are parked at the entrance and drivers report to reception. Here the waste manifest and associated documentation is reviewed to ensure the waste is clearly identified, and operations personnel can provide unloading and storage instruction. In the event there is insufficient documentation accompanying a load of waste, Cleanaway will contact NT EPA to discuss the most appropriate actions. Waste transport, unloading and storage instructions vary dependent on the waste type, as outlined in Table 2-2.

Table 2-2 Summary of Waste Streams

Waste Stream	Stored on Site?	Site Storage Location	Final Destination
Kerbside Collections – Recyclable	Yes	Materials Recycling Facility	Segregated waste streams are sent offsite for reprocessing
Kerbside Collections – general waste	No	Licenced landfill	EPA-licenced landfill (e.g. Shoalbay landfill)
Commercial & Industrial Collection	No	Licenced landfill	EPA-licenced landfill (e.g. Shoalbay landfill)
Septic, Grease Trap	No	Power & Water	EPA-licenced storage/treatment/disposal facility (e.g. Power & Water ponds)
Oily Water	Yes	Waste Oil Tank Farm	Gravity separation of hydrocarbon and water within tank farm. Oil sent offsite for refining, oily water sent offsite for treatment and disposal of effluent.
Waste Oil	Yes	Waste Oil Tank Farm	Offsite for refining of waste oil
Hazardous Chemicals - Packaged	Yes	Hazardous Chemical Storage Shed	Offsite for resource recovery / treatment / safe disposal
Vehicle Washbay Wastewater	Yes	Washbay bund	Solids are collected and disposed of as hydrocarbon contaminated material. Liquid is re-circulated, with excess sent offsite for treatment and / or disposal

2.4 Waste Treatment and Disposal

Cleanaway adopts the Waste Management Hierarchy, with the objective to minimise tonnages to landfill. Wastes stored on site are sorted and segregated by waste type. Recoverable waste streams are sent to offsite processing facilities for recycling and reuse, and residual waste is transported to licenced treatment and disposal facilities for safe, regulated disposal. Resources recovered on site include low density polyethylene, high density polyethylene, mixed soft plastics, glass, paper, cardboard, scrap metal and waste oil.



Figure 2-1 Waste Management Hierarchy

3 Conceptual Site Model and Risk Assessment

Potential impacts to the environment have been reviewed as part of the development of a conceptual site model specific to key site operations/ accepted waste streams which is presented as Appendix 1. A conceptual site model is a representation of site-related information regarding contamination sources, associated receptors and exposure pathways between those sources and receptors (NEPC, 1999 as amended 2013). The development of a conceptual site model is an essential part of site assessments and provides the framework for identifying how the site may become contaminated and how potential receptors may be exposed to contamination/ pollution either in the present or the future. A conceptual site model is used as a tool to support decision-making processes and facilitate environmental risk assessment. Based on the outcomes of the CSM a risk assessment was undertaken for the Site which is presented as Appendix 2.

4 Stormwater Management and Monitoring

4.1 Environmental Objective

The environmental objective of stormwater management is to protect the water quality of public stormwater.

4.2 Management Actions

Local drainage on the site has a north-easterly aspect. Refer to Figure 4-1 Earthworks and landform design divert rainfall runoff along three pathways. Small volumes of rainfall from the front entrance and driveway of the site flow in a NE direction, and are captured in a stormwater drain reporting to the western boundary of the site. Runoff from this catchment discharges via sampling point SW01. The risk of contamination for stormwater discharged at SW01 is considered low, as the catchment is largely upstream of the yard and mesh grates cover the drain to control litter ingress. Runoff from the middle and eastern aspects of the site entrance report to a diversion drain which lies along the site's eastern boundary. Drainage within the yard reports through several spoon drains to the northern extent of the yard and is then diverted to the eastern diversion drain. During large flow events, the eastern diversion drain discharges offsite via sampling point SW02.

To reduce the likelihood of contaminated stormwater discharging offsite tanks, sheds and bunds are used across site to provide secure primary and secondary containment to all hazardous liquid wastes. As outlined in the conceptual plan shown overleaf, containment structures include:

- A waste oil tank farm and loading bund. Waste oil is transferred between tank farm and vehicle parked within the rollover bund, to capture any spills during transfer. Waste oil within the tank farm is stored in self-bunded tanks, which are fully sealed to prevent rainfall ingress.
- Bulk lubricants used in the mechanical workshop are stored within the lubricant bund. Smaller containers of liquids and cleaning products are stored within portable pallet bund, within the workshop to prevent rainfall ingress.
- Washwater and cleaning products at the truck washbay are captured within the concrete bund, and report through a triple interceptor. Treated water reports through to the storage tanks, and is either re-used for vehicle washing, or sent offsite to a licenced facility for treatment or disposal.
- Hazardous liquid waste collections other than waste oil are diverted away from site. The hazardous chemical storage shed remains on site to provide bunded storage capacity in the event that offsite disposal and storage options are not feasible. Inspecting the integrity of primary containers, and storing hazardous wastes within the bunded facilities mentioned above, reduced the risk of hazardous chemicals contaminating stormwater runoff within the yard. Additional controls include the mesh fencing at both SW01 & SW02 to prevent release of windblown litter, and an interceptor pit at the north eastern corner of the yard, to provide a tertiary level of containment.

4.3 Performance Criteria, Timing and Responsibility for Implementation

To measure the performance of stormwater controls onsite, stormwater sampling is conducted annually during the wet season. Both stormwater discharge points, SW01 and SW02, are sampled with laboratory analysis undertaken by a NATA-accredited laboratory for the analytical schedule as detailed in Table 4-1. The suite of analysis has been selected based on potential contaminants identified on site and a review of historical data. Following each sampling event, a report is prepared by a suitably qualified environmental consultant. The results are compared against relevant water quality guidelines and historical analytical results. Where analytical results are identified to be outside of historical variation or exceed the adopted water quality guidelines, investigation into the potential cause of the variation/ exceedance is undertaken and on site operational procedures are reviewed.

Table 4-1 Summary of Current Analytical Schedule - Stormwater

Current Adopted Analytical Suite*

Field: pH, Electrical Conductivity/ Total Dissolved Solids, Redox Potential and Dissolved Oxygen

Laboratory:

- Total Metals (Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Zinc);
- Total Recoverable Hydrocarbons;
- Total Suspended Solids; and
- Ammonia, Nitrite, Nitrate, Total Phosphorous, Total Nitrogen, Total Kjedhal Nitrogrn (TKN).

^{*} Minor changes to the analytical schedule are to be made if the understanding of the risk present at the site change. Cleanaway will manage this in consultation with the environmental consultation.



Figure 4-1Site Conceptual Plan, Including Stormwater Drainage

Catchment from western edge of site entrance, reporting through to sampling location SW01 on the western boundary

Catchment along front entrance, reporting along an eastern diversion drain to the sampling location to the North East at SW02

Catchment within the operational footprint, with an NE drainage aspect reporting to the rear of the site, then diverting to the eastern diversion drain and SW02

5 Groundwater Management and Monitoring

5.1 Environmental Objective

The environmental objectives of groundwater management are to prevent contamination of groundwater through containment of wastes and hazardous substances.

5.2 Management Actions

Protection of groundwater is undertaken by appropriately managing waste materials on site and preventing the downward migration of contaminants to groundwater beneath the Site. The containment measures for the protection of groundwater beneath the Site have been described in the waste storage section of this EMP.

5.3 Performance Criteria, Timing and Responsibility for Implementation

To validate groundwater protection measures are successful, Cleanaway conducts an environmental monitoring program, to assess the risk of discharging contaminated waters to the local aquifers. On a bi-annual frequency, samples are collected from a series of groundwater monitoring wells, as shown in Figure 5-1. Samples are sent to a NATA-accredited laboratory for the analytical schedule as detailed in Table 5-1.

Data collection, laboratory testing and interpretation of the results are conducted by qualified environmental professionals, including appropriate quality assurance and quality control measures to provide confidence in the accuracy and precision of the results. The results are interpreted to assess the risk of operations creating environmental harm to surrounding groundwater, and also to monitor the effectiveness of natural attenuation from historic contamination. In the event that results indicate any new potential or actual harm from operational activities, Cleanaway will immediately alert the NT EPA, and engage subject matter experts to identify appropriate remedial and preventative actions.

Table 5-1 Summary of Current Analytical Schedule - Groundwater

Current Adopted Analytical Suite*

Field: pH, EC/TDS, redox potential, dissolved oxygen and turbidity

Laboratory:

- Total Metals (Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Zinc);
- Total Recoverable Hydrocarbons;
- Benzene, Toluene, Ethyl Benzene, m+p-Xylene, o-Xylene (BTEX);
- Polycyclic aromatic hydrocarbons; and
- Groundwater samples collected from MW08 and MW09 were also submitted for the analysis of Ammonia, Nitrite, Nitrate, Total P, Total N and TKN.

^{*} Minor changes to the analytical schedule are to be made if the understanding of the risk present at the site change. Cleanaway will manage this in consultation with the environmental consultation.

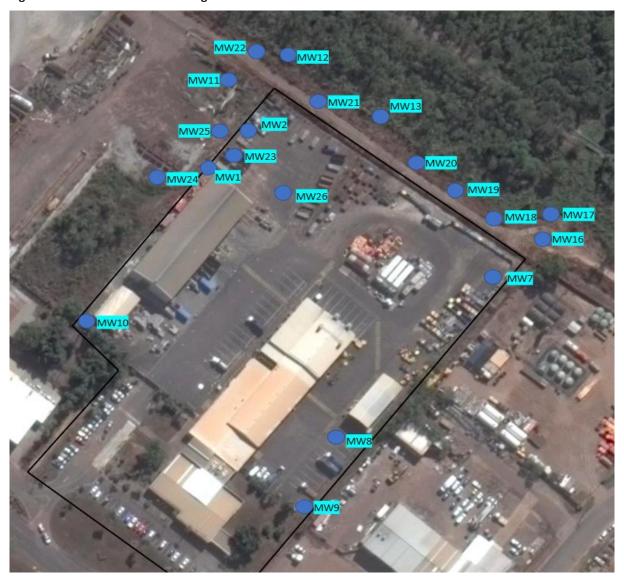


Figure 5-1 Groundwater Monitoring Locations

Note that sample collection from monitoring wells can be impeded during monitoring events by weather conditions, damage to wells or access restrictions. All reasonable efforts will be made to sample each well, however missing samples from individual wells will not be considered to be a non-compliance with licence requirements where adequate samples are collected from the surrounding monitoring wells.

6 Air Quality Management and Monitoring

6.1 Environmental Objective

The environmental objective for air quality management is to minimise the disturbance to ambient air quality for the local community.

6.2 Management Actions

Air quality on site can be impacted by a variety of operational processes. Potential impacts include noise, dust and odour from both fugitive and point sources. A variety of controls are in place to keep risks to a reasonable level, including:

- the site is sealed, reducing dust lift-off from vehicle traffic
- vehicles are well maintained, including exhaust systems
- highly odorous wastes are not processed on site
- general waste segregated from recyclables at the MRF is disposed of to landfill on a regular basis.
- Waste sorting and segregation activities occur within the MRF shed to buffer noise levels

6.3 Performance Criteria, Timing and Responsibility for Implementation

Cleanaway maintains a register of complaints. Any complaint received is entered into the Vault database as an incident for investigation. As an incident is logged, a review date and responsibility is also logged to ensure that the issue is addressed. Recent records show nil complaints related to air quality, which supports the findings of air quality dispersion modelling.

7 Litter Control and Monitoring

7.1 Environmental Objective

The environmental objectives of litter management are to use all reasonable and practicable measures to minimise the amount of windblown litter.

7.2 Management Actions

Cleanaway uses a variety of controls to minimise the spread of litter.

- All recyclable waste streams are sorted within the enclosed MRF, to reduce loose items becoming windblown.
- Improving the continued operation of the MRF.
- The site is fully fenced, to capture windblown litter. The fence is regularly inspected to ensure that there are no holes allowing the escape of windblown litter.
- Mesh grates cover the western stormwater drains, to control stormwater ingress.
- Daily sweeping/ picking of the yard surrounding the MRF.
- Inspection of drains following large rainfall events to clear of debris.

7.3 Performance Criteria, Timing and Responsibility for Implementation

Monthly workplace inspections include an assessment of litter. Where observed, a corrective action and responsibility is recorded. Observations of litter result litter collection campaigns to keep the yard tidy.

8 Community Consultation

The objective of community consultation is to maintain professional relationships with nearby community members and provide a process to address any concerns raised.

Cleanaway carefully manages potential impacts from the risk of nuisance during operations, as outlined in the sections above. In the event that Cleanaway receive an environmental complaint, the complaint is entered into the complaints register. The complaint is registered for investigation and resolution with a responsibility assigned. Details captured include the time, date, nature of the complaint, potential causes and remediation strategies, consistent with requirements of EPL 254.

Cleanaway's planning processes also take into account both customers and the broader community when managing the impacts of interruptions to routine business. In the event of interruptions to business, Cleanaway implement the following business continuity and response actions, to minimise interruption to customers and the local community.

Scenario 1: Inability to collect wastes due to interruption to truck or driver availability

Contingency Actions:

- 1. Contact external maintenance provider to repair vehicles (if appropriate)
- 2. Review available collection fleet and work schedule, and prioritise collections to minimise interruption to customers
- 3. Contact impacted customers and advise of changes to the schedule

Scenario 2: Inability to store wastes on site

Contingency Actions:

- 1. Identify cause for inability to store wastes, and implement a corrective action to mitigate the issue
 - a. Example 1: if the cause is a mechanical or electrical failure, work with the utility provider and contracted services to prioritise repairs
 - b. Example 2: if the cause is no available bunded storage capacity, prioritise transport of stored waste offsite to an EPA-approved treatment and/or disposal facility.
- 2. Review alternative local waste storage facilities and confirm availability
- 3. If the scenario has potential to cause nuisance to the neighbouring community, notify the neighbours and provide a summary of actions to fix the issue.
- 4. If the scenario impacts Cleanaway's ability to collect the waste, following the steps in Scenario 1

Scenario 3: IT / Communications failure, preventing effective communications with operations personnel and customers

Contingency Actions:

- Contact alternative Cleanaway business units (for example Port Adelaide and Darwin) to assist administrative assistance
- 2. Divert incoming calls and communications to the alternative business unit
- 3. Request the alternative business unit to Contact IT Service Desk and request support
- 4. Contact the local network provider (if required)
- 5. Initiate manual communication process with collection personnel, until issue is resolved.

Cleanaway also manages relationships with the local community when managing emergency scenarios, as outlined in Section 9.

9 Emergency Management

Emergency management on site includes risk identification, assessment, preparation and planning for a range of potential emergency scenarios, including (but not limited to) fire, large spills and flooding. Area wardens and first aid officers are points of escalation and control in the event of an emergency. Standby and evacuation alarms are maintained and routinely tested, and instructions are provided for appropriate use during emergency scenarios.

9.1 Fire

Key risks to cause fire on site include mixing of incompatible waste types during storage, unauthorised access and lightning strike. Dedicated dangerous goods storage areas are established within the hazardous chemical storage shed to provide safe segregation and prevent uncontrolled mixing of incompatible substances. The site is fully fenced and secured to manage the risk of unauthorised access and vandalism outside of business hours.

In the event of a fire, the evacuation alarms are activated and the area warden is notified. The warden arranges notification of emergency services, and provides and assessment of the situation. If safe to proceed, the warden will provide instruction to trained personnel to extinguish the fire, or to otherwise evacuate the area. NT EPA will be notified of any fire occurrences.

9.2 Large Spill

Waste is stored within dedicated areas across site. A material safety data sheet for each chemical is kept on site, and at the site entrance for easy access in the event of an emergency. In the event of a spill, the size and nature of the spill is assessed, referring to the SDS for handling instructions. If the spill can be safely contained and cleaned up, then appropriate spill response equipment is deployed. Where the spill cannot be quickly and safely contained, the operations manager is notified. The operations manager will assess the risk and activate the standby alarm if appropriate, unless the spill poses requires a site evacuation in which case the evacuation alarm is activated. The operations manager will co-ordinate notification to Emergency Services, including the NT EPA, and assist in co-ordinating the spill response as appropriate. An incident report is then complete and stored within the Health, Safety and Environment Database.

9.3 Flooding

As outlined in the stormwater management section, stormwater flow paths divert surface water away from waste storage locations. Bunded storage areas are also elevated to prevent stormwater ingress.

In the event that flooding presents an uncontrolled containment risk for hazardous wastes, the operations manager will liaise with emergency services and co-ordinate actions as required. NT EPA will be notified of any emergency situations which pose a risk to the environment and/or community.

10 Reporting

As mentioned in earlier sections, Cleanaway will notify the NT EPA as soon as reasonably practicable, where monitoring results or other information indicate there is a change in the nature of potential material harm to the environment.

Consistent with past practice, Cleanaway will provide an annual report to the NT EPA, addressing the status of compliance with each individual licence condition. Where the status indicates potential or actual non-compliance, Cleanaway will provide a detailed description of the situation, including any environmental impacts, and a list of actions taken to resolve the non-compliance.

Cleanaway will store monitoring reports for a 5 year period, and will provide these to the NT EPA upon request.

11 Inspection and Maintenance

In addition to operating in accordance with the above with processes, maintenance activities are conducted to verify that control measures are effective. Key activities include:

- A thorough preventative maintenance and servicing schedule for all fleet, to ensure safe and efficient operation
- Monthly workplace inspections, including waste storage areas and the stormwater system
- Routine litter collection form the yard
- Annual cleanout of the vegetated stormwater drains, removing excess growth & debris.

12 Environmental Management Plan Monitoring and Auditing

12.1 Training and Awareness

The following is undertaken to ensure that all site staff and visitors to the site are trained/ aware of the requirements of the environmental management plan:

- The site specific induction references the Licence and key activities undertaken on site to ensure compliance with the EMP. The induction also outlines the responsibility to mitigate environmental harm and environmental emergency response procedure.
- Key site staff are trained undertaking activities relevant to the EMP. Where required, site specific training packages will be developed for compliance purposes.
- Following updates to site management documents (including the Environmental Management Plan) training sessions are incorporated into Toolbox meetings. A record of all staff who've undertaken the training is maintained.

Records are kept supporting these activities.

12.2 Workplace Inspection

To verify that appropriate controls are in place and effective to prevent unauthorised environmental impacts, workplace inspections are carried out by the site manager. As part of Cleanaway's commitment to continuous improvement, as new controls are identified and implemented checks are added to the Health, Safety and Environmental inspection template to provide a verification process.

The workplace inspection includes verification of the appropriate management of waste storage, water management, air quality and litter control.

12.3 Auditing

The site is part of the larger national Cleanaway portfolio. Cleanaway conducts annual internal audit programs to address key environmental risks, and also engages external providers for auditing and maintenance of the ISO140001 accreditation for the Environmental Management System.

12.4 Non-Conformances

A register for non-conformances has been established and is maintained for all active and resolved non-conformances. All non-conformances are reviewed and corrective actions developed to prevent recurrence.

The EMP will be revised wherever appropriate to reflect these corrective actions.

12.5 Record Keeping

Records will be kept of the following:

- Changes to this EMP;
- Minutes of meetings;
- Environmental inspection reports;
- Waste classification for materials disposed of off Site;
- Non-conformances and complaints; and
- Approvals, certification and licences issued by statutory authorities.

All document revisions will be numbered to identify their status and the authorising person/ party.

12.6 Review

A review process shall be carried out to verify compliance to and effectiveness of the EMP. The review will be managed by the EMP Manager who will:

- Undertake the reviews;
- Maintain records of the review; and
- Ensure corrective actions are promptly implemented.

The review will be undertaken on a two yearly basis and/ or in the event of a significant change in operations. In accordance with the requirements of the Licence, the revised EMP will be provided to NT EPA within 10 days of the document being revised.

13 Findings from s48 Audits and Water Monitoring Reports

This Environmental Management Plan outlines how the findings of the section 48 audit program reports and of the most recent water monitoring report have been addressed. Responses to key findings are presented in Table 13-1.

Table 13-1 Responses to Key Findings of s48 Audits

Finding	Improvement Action(s)
House-keeping practices	
The audit included observations of litter in the vegetated stormwater drain and inappropriate storage of liquid wastes	Vegetated stormwater drains are cleared annually, and any debris and litter is removed. Small (<=1000L) containers of liquid waste are stored within bunded areas on site. To improve storage capacity and capability, Cleanaway is currently procuring a design for a new on-site liquid storage facility, and will apply to NT EPA for an Environmental Protection Approval prior to construction. Bulk liquid hydrocarbon wastes are unloaded and stored within the tank farm. Vehicles loading or unloading waste are parked within the transfer bund, and connect to the AS1940-compliant transfer manifold, complete with antisyphon infrastructure. Transferred wastes are stored within the 3x clearly labelled, self-bunded tanks.
Site access and waste acceptance	
The audit noted the site access gate was not operational, restricted Cleanaway's ability to restrict site access.	Access to the site is controlled through the front access gate, which is fully functioning & controlled by operations personnel at the depot.
It also noted not all wastes are sampled on site, creating a risk of accepting non-approved waste types	The waste acceptance procedure has been reviewed to reflect a risk-based approach. Where customers are reasonably able to provide a declaration of the waste, the wastes are labelled & accepted to site. In the event wastes cannot be identified, Cleanaway offer support to the customer by arranging third party lab testing and waste classification services.
Plant & Equipment	
The audit noted not all vehicles used to transport wastes were listed on the Environmental Protection Licence	All vehicles transporting listed waste on public roads are listed on EPL 254, using the electronic "ILIS" platform hosted by NT EPA. Vehicles are inspected daily and audited on regular intervals, to ensure appropriate documentation is complete
Stormwater and Groundwater Management	
The audit noted that stormwater drains contained vegetation and some litter & debris.	The stormwater drains are now cleared annually, and inspected during the monthly workplace inspection
The audit noted that due to bunding constraints for storage of hazardous wastes, the stormwater system may not prevent discharge of contaminants offsite	Please refer to bunding improvements as per the "Hazardous chemicals storage and handling" section below. This document provides a site-specific monitoring plan for groundwater, including locations and analysis.
The audit recommended that the	5. Gandwater, melaanig rocations and analysis.
groundwater monitoring plan be updated to reflect changes in the network of monitoring bores, and to discuss the suitable suite of analysis.	This document provides a site-specific management plan for stormwater onsite, including risks, appropriate control measures & monitoring effort

Finding	Improvement Action(s)
The audit noted the stormwater management plan was not site specific	
Hazardous chemicals storage and handling	
At the lubricant storage area there was 3,500L of waste oil and lubricant stored with bunding unverified, and with the drainage sump blocked by a container	Bunding upgrades have been complete to the lubricant storage area, and storage racking has been installed to facilitate good housekeeping and to avoid covering the drainage sump.
The hazardous chemical storage shed contained liquid wastes which were not appropriately labelled & segregated.	Consistent with the updated waste acceptance procedure, prior to collection and acceptance all wastes are classified and labelled. The current hazardous chemical storage shed provides room for segregation between different classes of dangerous goods. To improve storage capacity and capability, Cleanaway is currently procuring a design for a new on-site liquid storage facility, and will apply to NT EPA for an Environmental Protection Approval prior to construction.
Above ground storage tanks (tank farm) did not have an associated maintenance plan, to outline its compliance with AS1940. There was also 4x 26KL tanks on site which did not appear to have appropriate bunding.	A new tank farm maintenance plan has been developed, covering inspection and management of the drive-on drive-off transfer bund, transfer manifold and 3x self-bunded tanks. The drive on bund, transfer manifold and interstitial space of the bunded tanks are tested on a routine basis. In accordance with AS1940 9.17.1, the primary vessels of the self-bunded tanks are tested on a 10-yearly schedule by qualified technicians. The first round of testing is due for completion in 2025. Due to staff turnover since February 2016, it is not clear what 26KL tanks were on site, however, no tanks are used on site to store liquid waste outside of a bunded area.
Spill kits requirements were not adequately assessed against the volume of waste stored on site	Spill kits are stored on site in areas where hazardous materials are stored, namely at the hazardous storage workshop, the vehicle maintenance workshop and the tank farm. Additional spill kit materials are stored in vehicles and in the hazardous materials storage shed. Cleanaway notes that the secondary containment measures for those areas are appropriate, as outlined in this updated Environmental Management Plan, and believe residual risk of spills can be managed using the spill kits currently stored on site.
Washbay and triple interceptor were identified to contain litter within the interceptor drain cover, and to include 30mg/L total petroleum hydrocarbons within the wastewater	As noted in the audit report, the washbay is a well bunded area to capture any washwaters & direct them to the triple interceptor, via the drainage sump. The drainage sump contains a filter for litter and debris, which is cleaned out as required to prevent pooling. Since the audit, the water treatment process has been upgraded, to promote re-use of the treated washwaters to wash subsequent vehicles, within the confines of the washbay bund. Treated washwaters can also be stored in the effluent tank, and transport offsite to a licenced treatment or disposal facility.
Document management and Record Keeping	
The audit noted that the Environmental Management Plan, Stormwater Management Plan were holistic and not site-specific	This document provides a site-specific management plan for the licenced operations, including location-specific risks, appropriate controls measures and monitoring effort.
	The company is continually improving its record keeping process. Movement of wastes are regulated through the

Finding	Improvement Action(s)
The audit noted that record management was not well understood by the auditees	"VRP" & "JDE" databases, with local records also stored on site. Following integration of the Tox Free business, all HSE activities, including incidents, site inspections, toolbox talks and audits will be recorded into the HSE database MYOSH.
Internal Compliance Verification	
Develop appropriate compliance checklists to verify the licence and subsequent plans are understood and adhered to.	The monthly workplace inspection has been updated to a location specific format. In each area, control measures in relation to environmental risks are inspected and verified, and any gaps are documented and actioned.
	Subject to EPA-approval of this EMP, an additional "licence compliance tool" will be created to audit whether all requirements of EPL 254 & of this management plan are complied with.
Develop a communication plan to train staff with the requirements of the licence and any subsequent plans	The requirements of former EPL 125 were regularly reviewed with site management and discussed with transport and depot staff. Subsequent to EPA-approval of this EMP, a refresher toolbox will be complete with all staff outlining environmental requirements.

14 Appendix 1 - Conceptual Site Model

Potential impacts to the environment have been reviewed as part of development of a conceptual site model specific to key site operations which is presented as Appendix 1. A conceptual site model is a representation of site-related information regarding contamination sources, associated receptors and exposure pathways between those sources and receptors (NEPC, 1999 as amended 2013). The development of a conceptual site model is an essential part of site assessments and provides the framework for identifying how the site may become contaminated and how potential receptors may be exposed to contamination either in the present or the future. A conceptual site model is used as a tool to support decision-making processes and facilitate environmental risk assessment.

Based on the outcomes of the CSM a risk assessment was undertaken for the Site which is presented as Appendix 2.

The following conceptual site model has been prepared for the operation and maintenance of the Site.

14.1 Sources

Potential sources of contamination are summarised in Table 14-1.

Table 14-1 Summary of Potential Sources of Contamination

ID	Source	Description
S1	Liquid waste stored on site	The site receives and processes liquid wastes
S2	Solid recyclable waste stored on site	The site receives and processes recyclable solid waste which has the potential to generate litter on site
S3	Chemicals stored on site	Chemical are stored on site to facilitate on site operations
S4	Washdown bay	The washdown bay is located in the eastern portion of the Site and is used to wash down vehicles and equipment as required. Effluent from the washbay is a potential source of contamination.
S5	Contamination within groundwater	Groundwater at the site near the former AST farm has been demonstrated to be impacted with hydrocarbons
S6	Noise and Odour	Noise and odour associated with on Site operations

14.2 Receptors

Based on available information, the potential sensitive receptors at the Site (future, potential) and adjacent to the Site are grouped as follows:

- Human receptors;
- Environmental receptors; and
- Operational receptors.

A summary of identified receptors is presented in Table 14-2.

Table 14-2 Summary of Potential Receptors

ID	Receptor	Description
R1	Current/ future site users	Site workers and staff responsible for maintaining the wastewater system
R2	Groundwater	Aquatic Ecosystem associated with groundwater
R3	Public stormwater system/ reserve	Terrestrial Ecosystem associated with the public stormwater system within the neighbouring reserve to the north of the Site
R4	Neighbouring site users	Properties that border the Site

14.3 Pathways

Potential exposure pathways linking the potential source to sensitive receptors are evaluated for completeness based on the existence of:

- A source of chemical contamination;
- A mechanism for release of contaminants from identified sources;
- A contaminant retention or transport medium (e.g. soil, air, groundwater etc.);
- Potential receptors of contamination; and
- A mechanism for chemical intake by the receptors at the point of exposure (for example, ingestion, dermal contact or inhalation or a combination of).

Whenever one or more of the above elements is missing, the exposure pathway is incomplete and therefore no further risk to the identified receptor. An exposure pathway can be either direct (where the receptor comes into direct contact) or indirect where exposure occurs at a different location or in a different medium than the source (e.g. soil vapours volatilising to air). A summary of identified potential pathways is presented in Table 2.5.

Table 14-3 Summary of Potential Pathways

ID	Pathway	Description
P1	Ingestion	Ingestion of waste material or dust generated from waste material
P2	Inhalation	Inhalation of dust of vapours associated with the waste material as well as vapours associated with groundwater impacted with volatile chemicals
P3	Direct contact	Direct contact with stored waste material
P4	Migration via unsaturated zone	Possible migration into groundwater from impacted soil above water-table or leachate from waste stored above ground level
P5	Migration via the saturated zone	Possible migration of chemical substances present in groundwater

14.4 Potential Contaminant Linkage Assessment

Where a source, pathway and receptor are present a potential contaminant linkage exists. A total of 35 potential contaminant linkages (risks to human health and ecological protection) associated with the identified source, pathways and receptors were identified and are summarised as Table 14-4. A risk assessment has been

undertaken for operations on site based on key site areas/ functions which is presented as Appendix 2. The risk assessment and this EMP account for the management of each of the identified potential contaminant linkages.

Table 14-4 Summary of Potentially Significant Contaminant Linkages

Linkage	Source	Pathway	Receptor
L1	S1 - Liquid Waste	P1 - Ingestion	R1 - Current/ Future Site User
L2	S1 - Liquid Waste	P2 - Inhalation	R1 - Current/ Future Site User
L3	S1 - Liquid Waste	P3 - Direct Contact	R1 - Current/ Future Site User
L4	S1 - Liquid Waste	P3 - Direct Contact	R3 - Public Stormwater
L5	S1 - Liquid Waste	P1 - Ingestion	R4 - Neighbouring Site User
L6	S1 - Liquid Waste	P2 - Inhalation	R4 - Neighbouring Site User
L7	S1 - Liquid Waste	P3 - Direct Contact	R4 - Neighbouring Site User
L8	S1 - Liquid Waste	P4 - Migration via Unsaturated Zone	R2 - Groundwater
L9	S2 - Solid Waste	P1 - Ingestion	R1 - Current/ Future Site User
L10	S2 - Solid Waste	P2 - Inhalation	R1 - Current/ Future Site User
L11	S2 - Solid Waste	P3 - Direct Contact	R1 - Current/ Future Site User
L12	S2 - Solid Waste	P3 - Direct Contact	R3 - Public Stormwater
L13	S2 - Solid Waste	P1 - Ingestion	R4 - Neighbouring Site User
L14	S2 - Solid Waste	P2 - Inhalation	R4 - Neighbouring Site User
L15	S2 - Solid Waste	P3 - Direct Contact	R4 - Neighbouring Site User
L16	S2 - Solid Waste	P4 - Migration via Unsaturated Zone	R2 - Groundwater
L17	S3 - Chemicals Stored on Site	P1 - Ingestion	R1 - Current/ Future Site User
L18	S3 - Chemicals Stored on Site	P2 - Inhalation	R1 - Current/ Future Site User

Linkage	Source	Pathway	Receptor
L19	S3 - Chemicals Stored on Site	P3 - Direct Contact	R1 - Current/ Future Site User
L20	S3 - Chemicals Stored on Site	P3 - Direct Contact	R3 - Public Stormwater
L21	S3 - Chemicals Stored on Site	P1 - Ingestion	R4 - Neighbouring Site User
L22	S3 - Chemicals Stored on Site	P2 - Inhalation	R4 - Neighbouring Site User
L23	S3 - Chemicals Stored on Site	P3 - Direct Contact	R4 - Neighbouring Site User
L24	S3 - Chemicals Stored on Site	P4 - Migration via Unsaturated Zone	R2 - Groundwater
L25	S4 - Washdown Bay	P1 - Ingestion	R1 - Current/ Future Site User
L26	S4 - Washdown Bay	P2 - Inhalation	R1 - Current/ Future Site User
L27	S4 - Washdown Bay	P3 - Direct Contact	R1 - Current/ Future Site User
L28	S4 - Washdown Bay	P3 - Direct Contact	R3 - Public Stormwater
L29	S4 - Washdown Bay	P1 - Ingestion	R4 - Neighbouring Site User
L30	S4 - Washdown Bay	P4 - Migration via Unsaturated Zone	R2 - Groundwater
L32	S5 - Contaminated Groundwater	P5 - Migration via Saturated Zone	R2 - Groundwater
L33	S5 - Contaminated Groundwater	P5 - Migration via Saturated Zone	R4 - Neighbouring Site User
L34	S6 – Noise/ Odour	P3 - Direct Contact	R1 - Current/ Future Site User
L35	S6 – Noise/ Odour	P3 - Direct Contact	R4 - Neighbouring Site User

15 Appendix 2 - Site Environmental Risk Assessment and Register

The table below forms the site environmental risk assessment and register associated with activities undertaken on site. The risk assessment includes consideration of the potential contaminant linkages as detailed in Appendix 1 in addition to other site related risks.

Activity	Aspect	Potential Impact	Causes	Likelihood	Consequence	Pre Control Risk Score	Controls In Place	Review / Monitoring	Likelihood	Consequence	Post Control Risk Score
Unloading Waste at depot	Air Quality	Discharge of dust, odour or airborne pollutants offsite	movement of wastes with fine particulates, wind exposure to exposed waste, faulty vehicles	likely	Moderate	14 high	Waste storage areas are undercover to protect from wind Roads/Surfaces are largely sealed Vehicles are maintained using JDE & DAMS report to ensure appropriate servicing The Vault is used as a complaints register, and each complaint is treated as an incident for investigation and resolution	Risk register reviewed annually Monthly Workplace Inspections Complaints entered into Vault as incidents DAMS report generated to ensure compliance with service/maintenance plan	unlikely	Minor	7 low
	Water Quality	Contamination of offsite stormwater, or infiltration to groundwater	wastes enter washdown water or rainfall runoff	almost certain	Moderate	15 high	Waste transfer and storage area is fully sealed, preventing ingress to soils and groundwater Unloading bund for tank farm holds spills during unloading. Site is fenced to ensure no litter escapes to surrounding stormwaters Stormwater drains are covered with grates to contain loose litter	Risk register reviewed annually Monthly Workplace Inspections	possible	Minor	8 medium
	Noise	Noise nuisance to surrounding neighbours from traffic and unloading	Unloading waste to ground, vehicle traffic	likely	Moderate	14 high	The recycling facility is covered to buffer sound Any complaints about environmental issues related to the licence are entered into Vault as incidents for investigation	Risk register reviewed annually Monthly Workplace Inspections	unlikely	Minor	7 low

Activity	Aspect	Potential Impact	Causes	Likelihood	Consequence	Pre Control Risk Score	Controls In Place	Review / Monitoring	Likelihood	Consequence	Post Control Risk Score
Waste processing, including sorting and reclaiming	Noise	Noise nuisance to surrounding neighbours from traffic and unloading	Unloading waste to ground, vehicle traffic, heavy machinery movement	possible	Moderate	13 high	The recycling facility is covered to buffer sound Any complaints about environmental issues related to the licence are entered into Vault as incidents for investigation	Risk register reviewed annually Monthly Workplace Inspections	unlikely	Minor	7 low
	Air Quality	Discharge of dusts offsite	movement of waste with fine particulates	likely	Moderate	14 high	Waste storage areas are undercover to protect from wind Roads/Surfaces are largely sealed Vehicles are maintained using JDE & DAMS report to ensure appropriate servicing The Vault is used as a complaints register, and each complaint is treated as an incident for investigation and resolution	Risk register reviewed annually Monthly Workplace Inspections	unlikely	Minor	7 low
with heavy machinery	Litter	Litter escapes from premises & creates nuisance / pollution	Handling of loose recycling items from kerbside collections	likely	Moderate	14 high	The MRF is located indoors Processed & bailed wastes are stored undercover The site is fully fenced Stormwater drains are covered with grates	Monthly Workplace inspections	unlikely	Minor	7 low
	Water Quality	Contamination of offsite stormwater, or infiltration to groundwater	wastes lost to the ground from reclaiming, includes fines which become airborne and then settle, enter the site drainage network	almost certain	Moderate	15 high	Waste transfer and storage area is fully sealed, preventing ingress to soils and groundwater Oils transferred within bunded area Washwaters captured in bund, processed through VGS & transported to Power & Water (Utilities provider) for discharge into ponds Stormwater drains covered with grates to exclude loose litter Appropriate drainage is maintained on the site perimeter, to prevent ingress of runoff into the waste storage area.	Risk register reviewed annually Monthly Workplace Inspections	unlikely	Moderate	12 medium

Activity	Aspect	Potential Impact	Causes	Likelihood	Consequence	Pre Control Risk Score	Controls In Place	Review / Monitoring	Likelihood	Consequence	Post Control Risk Score
	Air Quality	Discharge of dust offsite	waste is left on hard stand areas, and fine particles which are dragged out by vehicles become airborne as it dries wastes are exposed during transport, creating lift-off. Stormwater drains become blocked, creating pooling & making truck tyres wet. Tyres then gather fine particles and drag them out along with driveway. Once the moisture is dried up, those particles are then disturbed by future traffic & become airborne	likely	Moderate	14 high	Waste storage areas are undercover to protect from wind Roads/Surfaces are largely sealed Vehicles are maintained using JDE & DAMS report to ensure appropriate servicing The Vault is used as a complaints register, and each complaint is treated as an incident for investigation and resolution	Risk register reviewed annually Complaints entered into Vault as incidents	unlikely	Minor	7 low
Waste Transport, including vehicles and waste leaving site		Uncontrolled release of asbestos	Asbestos is transported in an uncontrolled manner, through inappropriate wrapping or inadequate signage allowing misidentification and insufficient care when handling	possible	Moderate	13 high	Asbestos volumes receipted are very low - Nil in 2017 Asbestos is only accepted on site if it is appropriately wrapped Asbestos is only transported in customer's containers. IF we used our own containers, we would: Asbestos is stored in a designated, signposted area for easy identification prior to transport offsite Asbestos wastes are labelled prior to transport with "CAUTION ASBESTOS - DO NOT INHALE DUST" Asbestos wastes are handled with care to prevent damage to the wrapping & release of dust	Risk register reviewed annually Complaints or incidents are entered into Vault for investigation	rare	Minor	6 low

Activity	Aspect	Potential Impact	Causes	Likelihood	Consequence	Pre Control Risk Score	Controls In Place	Review / Monitoring	Likelihood	Consequence	Post Control Risk Score
	Water Quality	Contamination of offsite stormwater, or infiltration to groundwater	waste is left on hard stand areas, and particles which collect on tyres are dragged out onto the road vehicle suffers mechanical fail and leaks hydraulic oil / hydrocarbons waste contents of vehicle is not adequately contained and is lost during transport	almost certain	Moderate	15 high	Waste transfer and storage area is fully sealed, preventing ingress to soils and groundwater Trucks are equipped with spill kits, and spill are clean immediately Stormwater diverted around site, to minimise sheet flows & ingress Workplace inspections complete to identify spills	Risk register reviewed annually Complaints entered into Vault as incidents	possible	Minor	8 medium
Waste Transport, including vehicles and waste leaving site (continued)	Unauthorised Transport and Disposal	Wastes are transported to a site not authorised to receive that waste type or volume Listed wastes are transported without appropriate SA EPA transport certificates	Management are not aware of the requirements Inadequate information is provided to drivers	possible	Moderate	13 high	Waste acceptance procedure Listed waste handling reports for verification		unlikely	Moderate	12 medium
	Signage	Vehicles used to transport listed waste are not appropriately licenced & labelled	Management not aware of the requirement Management not capable of updating licence information through online SA EPA licence portal	likely	Moderate	14 high	All vehicles moving listed wastes must display EPA sticker 125	Workplace inspections Risk Register & reviews	unlikely	Minor	7 low

Activity	Aspect	Potential Impact	Causes	Likelihood	Consequence	Pre Control Risk Score	Controls In Place	Review / Monitoring	Likelihood	Consequence	Post Control Risk Score
Waste & Chemical Storage	Land Custodianship	Fire Litter release Vermin infestation	Waste stockpiles are too large Insufficient litter controls Inappropriate wastes are receipted on site Inadequate fire prevention and control systems	possible	Moderate	13 high	No composting is conducted onsite Only wastes listed on EPA licence 125 are accepted on site Segregation & storage of DG's in Hazchem shed Fire suppression systems are in place on site including fire hoses around waste storage area & extinguishers in workshop and admin building	Risk register reviewed annually Workplace Inspections completed monthly, to check on size and capacity	unlikely	Moderate	12 medium

Activity	Aspect	Potential Impact	Causes	Likelihood	Consequence	Pre Control Risk Score	Controls In Place	Review / Monitoring	Likelihood	Consequence	Post Control Risk Score
Waste & Chemical Storage (continued)	Water Quality	stored wastes or chemicals are exposed to rainfall or stormwater ingress, increasing risk of contaminated water release offsite	Operation staff are not aware of the DG requirements Wastes are not appropriately identified in waste manifests Procedures are not adhered to	likely	Moderate	14 high	Waste transfer and storage area is fully sealed, preventing ingress to soils and groundwater bulk waste oil is stored within a self-bunded tank farm, and transfers are complete within the drive-in transfer bund Lubricants and coolant are stored in a bunded area Appropriate drainage is maintained on the site perimeter, to minimise ingress of runoff into the waste storage area. Spill kits are maintained on site with adequate stock	Risk register reviewed annually Workplace Inspections completed monthly, to check on size and capacity	possible	Minor	8 medium
	Air Quality	Discharge of odour Release of Asbestos / fibrous materials	Organic wastes are stored in large volumes on site, starting to decompose and release an environmental naissance through odour Asbestos is accepted on site without being appropriately wrapped, or stored in an inappropriate area without signage	possible	Moderate	13 high	Licence details, including permitted wastes, are displayed on a sign at the site entry Roads are sealed MRF operations undercover Asbestos is only accepted on site if it is appropriately wrapped in 200 micron thick (or greater) plastic Any asbestos accepted is then stored in a designated area with signs stating it is non-friable asbestos	Risk register reviewed annually Workplace Inspections completed monthly, to check on size and capacity Groundwater quality monitoring	rare	Moderate	11 medium

Activity	Aspect	Potential Impact	Causes	Likelihood	Consequence	Pre Control Risk Score	Controls In Place	Review / Monitoring	Likelihood	Consequence	Post Control Risk Score
	Waste Acceptance	Wastes are accepted on site which are not permitted on the licence	Operators not aware of licence condition Wastes not inspected prior to unloading	likely	Moderate	14 high	A copy of the licence is available at the front desk on site Workplace inspections are conducted, and non-compliances with the licence are communicated through toolbox talks and corrective actions Waste acceptance work instruction		unlikely	Minor	7 low
Business Administration Business Administration (continued)	Licence to Operate	Illegal operation	The licensee does not have appropriate administrative processes to ensure annual returns and annual fees are processed on time The licensee does not update its details if personnel change or if the licence is transferred The licensee does not display an appropriate EPA sign The licensee does not ensure adequate security	likely	Moderate	14 high	Operations Managers and the Senior Environmental Business Partner are the nominated contact for each NT EPA licence, to ensure they are contacted by NT EPA for annual returns & fees Annual returns & fees are tracked internally to ensure they are processed The site is secured with locked gates outside of operational hours Licence renewal notifications are currently in process	Risk Register Review Ongoing communication with SA EPA	unlikely	Moderate	12 medium
	Community Management	Operations cause environmental nuisance	Site completes work which may have impacts to nearby sensitive neighbours, and do not implement all reasonable and practicable actions to reduce the impacts	possible	Moderate	13 high	The depot is locked by gate when the premises is unattended Cleanaway actively manages the risk of environmental nuisance related to air quality, stormwater and noise, as described in this register Cleanaway enters each complaint related to environmental issues associated with licenced activities into the Vault as an incident, for investigation.		unlikely	Minor	7 low