



**Prestons Waste Treatment Facility**  
Amendment Report

Appendix F

**Draft Operational environmental management plan**



**PRESTONS WASTE TREATMENT FACILITY**  
**OPERATION ENVIRONMENTAL MANAGEMENT PLAN**  
Integrated Management System

ENV-M-20

**1 Introduction..... 1**

1.1 Overview ..... 1

1.2 Scope and Objectives ..... 2

1.3 Supporting Environmental Management Plans..... 2

1.4 Consultation ..... 3

**2 Facility Overview and Operation..... 4**

2.1 Facility Overview ..... 4

2.2 Operations Overview..... 6

2.3 Operational supporting systems..... 9

2.4 Operating Hours ..... 12

**3 Environmental Requirements..... 13**

3.1 Applicable Legislation ..... 13

3.2 Application Guidelines..... 14

3.3 Development Consent..... 15

3.4 Revised Environmental Management Measures..... 17

3.5 Permits and Licences ..... 18

**4 Operational Environmental Impacts ..... 19**

4.1 Risk Assessment ..... 19

4.2 Operational Environmental Impacts..... 19

4.3 Waste Management..... 20

4.4 Access, Traffic and Parking ..... 21

4.5 Noise and Vibration ..... 21

4.6 Air Quality..... 22

4.7 Soil and Water ..... 22

4.8 Hazards..... 24

4.9 Human Health ..... 24

4.10 Water Usage..... 25

4.11 Other environmental issues ..... 25

**5 Compliance Management ..... 27**

5.1 SEQ Management System ..... 27

5.2 Environment Policy..... 27

5.3 Roles and Responsibilities ..... 27

5.4 Inspections and Monitoring ..... 29

5.5 Reporting..... 30



**PRESTONS WASTE TREATMENT FACILITY**  
**OPERATION ENVIRONMENTAL MANAGEMENT PLAN**  
Integrated Management System

ENV-M-20

5.6	Training and Competence .....	32
5.7	Auditing .....	34
5.8	Communications .....	35
5.9	Complaints Management .....	35
5.10	Incident Management .....	36
5.11	Emergency Response .....	38
5.12	Non-Compliances and Corrective Actions .....	39
<b>6</b>	<b>Review and Improvement .....</b>	<b>41</b>
6.1	OEMP Annual Review .....	41
6.2	Contingency Planning .....	41
6.3	Adaptive Management .....	42
Appendix A	Environmental Observations And Actions Checklist .....	43
Appendix B	Incident And Emergency Response Plan .....	49
Appendix C	Unexpected Finds Management Plan .....	51
Appendix D	Operational Traffic management plan .....	52
Appendix E	Operational Air Quality Management Plan .....	53
Appendix F	Operational Waste Management Plan .....	54
Appendix G	Conditions of consent and Remms applicable to operation .....	55
Appendix H	Operational risk register .....	67

**List of tables**

Table 2-1: Summary of waste and proposed treatments .....	8
Table 2-2: Storage for regents .....	10
Table 2-3: Materials stored at the Facility .....	11
Table 3-1: Anticipated Conditions of Consent relevant to the OEMP .....	15
Table 3-2: Anticipated REMMs relevant to the OEMP .....	17
Table 3-3: Key permits and licences .....	18
Table 4-1 Relevant risk assessments .....	19
Table 4-2: Operational waste types .....	20
Table 4-3: Other low risk environmental impacts .....	25
Table 5-1: Environmental Roles and Responsibilities .....	27
Table 5-2: Operational inspection regime .....	29
Table 5-3: Operational monitoring regime .....	29
Table 5-4: Reporting Requirements .....	30



---

Table 5-5: Internal reporting requirements.....	31
Table 5-6: Emergency Contact Details.....	39

**List of figures**

Figure 1-1: Project site (Source: Google Maps) .....	1
Figure 2-1: Conceptual Facility Layout [Drafting note: Figure to be updated as required during detailed design following project approval] .....	5
Figure 2-2: Operations overview .....	6
Figure 5-1: Environmental Incident Response Flowchart .....	36

DRAFT



## Glossary

Term	Definition
AQIA	Air Quality Impact Assessment
ASS	Acid sulfate soils
CCO	Chemical Control Orders
CLM Act	Contaminated Land Management Act 1997
DAF	Dissolved air flotation (DAF)
DCP	Development Control Plan
DPE	Former NSW Department of Planning and Environment
DPHI	Department of Planning, Housing and Infrastructure
EIS	Environmental Impact Statement
EMS	Environmental Management System
EP&A Act	Environmental Planning and Assessment Act 1979
EPL	Environmental protection licence
GLCs	Ground Level Concentrations
HiQ	HiQ Waste Treatment Services Pty Ltd
HVAC	Heating, ventilation air conditioning
LWTP	Liquid Waste Treatment Plant
NAPL	Non-aqueous phase liquid
NEPM	National Environment Protection Measure
OAQMP	Operational Air Quality Management Plan
OEMP	Operation Environmental Management Plan
OVNMP	Noise and Vibration Management Plan
PAH	Polycyclic aromatic hydrocarbons
PASS	Potential Acid Sulfate Soils
PFAS	Per- and poly-fluoroalkyl substances
PIRMP	Pollution Incident Response Management Plan
POEO Act	Protection of the Environment Operations Act 1997



# PRESTONS WASTE TREATMENT FACILITY OPERATION ENVIRONMENTAL MANAGEMENT PLAN

Integrated Management System

ENV-M-20

Term	Definition
RtS	Response to Submissions
SSD	State Significant Development
TCE	Trichlorethylene
The Facility	9-13 Whyalla Place, Prestons NSW
Tpa	Tonnes per annum
TPH	Total petroleum hydrocarbons
TSP	Total suspended particulates
TWA	Trade waste agreement
UIN	Unique Identification Number
VOC	Volatile organic compounds
WARR Act	<i>Waste and Resource Recovery Act 2001</i>
WHS	Work health and safety
WMA	<i>Water Management Act 2000</i>
WTF	Waste Treatment Facility



## 1 Introduction

### 1.1 Overview

*[Drafting note: Section to be revised following approval]*

HiQ Waste Treatment Services Pty Ltd (HiQ) has submitted a State Significant Development application (SSD 9346594) for the construction and operation of a Waste Treatment Facility (WTF / Facility) at 9-13 Whyalla Place, Prestons NSW (the Site) in accordance with Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The WTF is wholly owned by HiQ (Refer to Figure 1-1).

HiQ is seeking approval to optimise the existing site for the purpose of processing and treating contaminated soils, sludges and liquid wastes to a level suitable for reuse or disposal to a landfill or sewer, with a throughput capacity of up to 210,500 tonnes per annum (tpa). The approval seeks to expand the existing warehouse to a total floor area of about 6,400 m<sup>2</sup> (an increase of 1,300 m<sup>2</sup>). This will be achieved through partial demolition of one external wall.

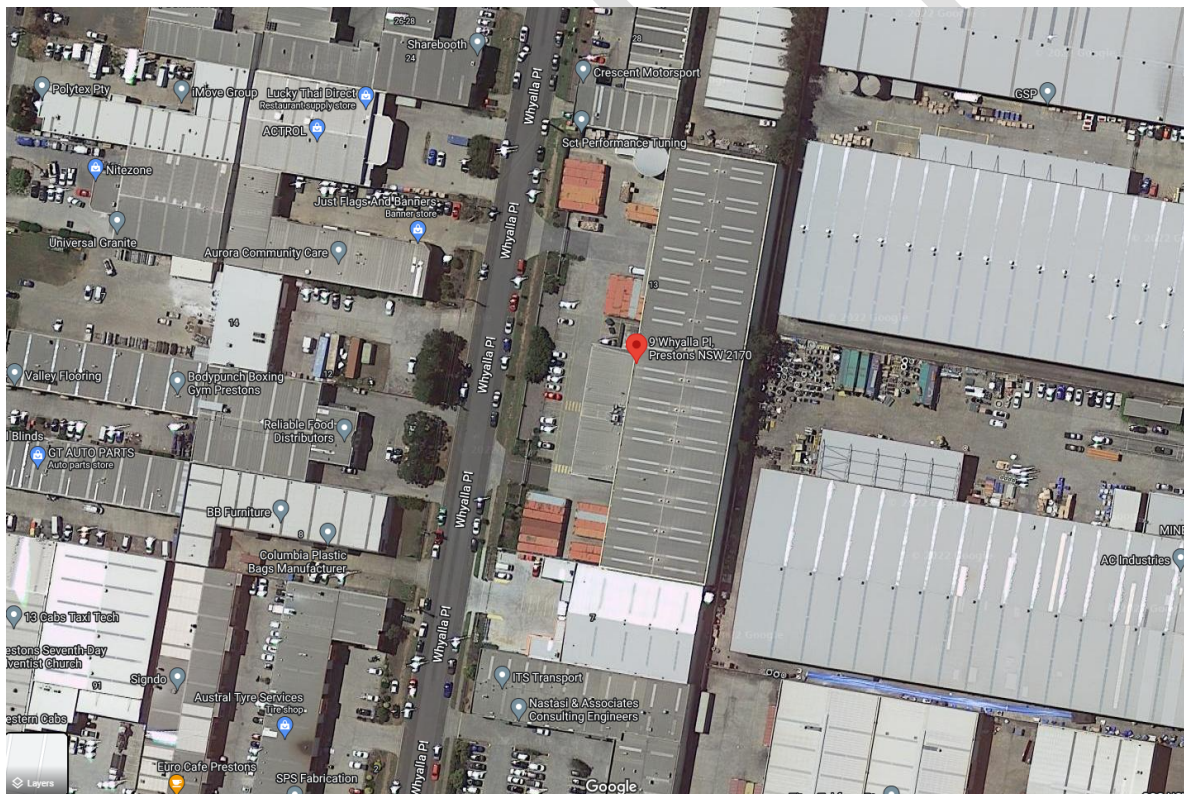


Figure 1-1: Project site (Source: Google Maps)



## 1.2 Scope and Objectives

*[Drafting note: Section to be revised following approval]*

This Draft Operational Environmental Management Plan (OEMP) has been prepared to support the Prestons WTF Amendment Report. This plan will be used to guide environmental management at the WTF during operation.

The management strategies and control measures detailed within the OEMP will be reviewed at a minimum annually and updated, where necessary, to reflect changes introduced by the HiQ, site specific outcomes, non-compliances and recommendations arising out of inspections, meetings and audits.

The OEMP provides the framework and guidance for Facility activities to be conducted in a manner whereby appropriate control measures are implemented to minimise the potential for adverse impacts on the environment and to meet compliance requirements of the approvals and licences.

The objectives of this OEMP are to:

- Provide an overview of the WTF (refer to the Facility Layout Plan in Figure 2-1)
- Describe the relevant legislation, policies, guidelines and standards which apply to the operation of WTF and which influence the environmental management principles and procedures to be used at the Facility
- Identify key environmental management issues relating to the operation of the WTF
- Provide a means of implementing appropriate mitigation measures for the key environmental issues (refer to the individual sub-plans in the Appendices) *[Drafting note: Determined by the Conditions]*
- Provide a working environmental management tool to follow during the operation of the WTF
- Define roles and responsibilities of the WTF
- Provide a guide for the interaction with relevant government authorities and other relevant stakeholders, including the community, during the operation of the WTF
- Provide standard operating procedures for the management of the WTF and key environmental issues
- Provide a basis for monitoring, reporting and maintaining compliance.

This OEMP and associated sub-plans have been prepared to provide the management measures to be implemented to minimise potential adverse impacts on the environment during the operation of the WTF.

## 1.3 Supporting Environmental Management Plans

A series of supporting environmental management sub-plans have been developed to support this OEMP. These sub-plans are provided as Appendices to this OEMP and are as follows:

*[Drafting note: Determined by the Conditions but likely to include traffic, noise, waste, water and air quality management plans]*

- Operational Air Quality Management Plan (OAQMP) (*Draft OAQMP provided, refer to Appendix G to the Amendment Report*)
- Operational Waste Management Plan (OWMP) (*Draft OWMP provided, refer to Appendix H to the Amendment Report*)
- Operational Traffic Management Plan (*Preliminary OTMP provided, refer to Appendix I to the Amendment Report*)



- Emergency Response Plan (Appendix B of this Plan).
- Stormwater and Leachate Management Plan (*to be developed prior to commencement of operations*)
- Operational Noise and Vibration Management Plan (ONVMP) (*to be developed prior to commencement of operations*)
- Landscape Plan (*to be developed prior to commencement of construction*).

#### 1.4 Consultation

[Drafting note: If required by the Conditions of Consent, this section will be updated to detail any of the required consultation.]

The OEMP may be required to be approved by the Department of Planning, Housing and Infrastructure (DPHI) prior to operations commencing.

DRAFT



## 2 Facility Overview and Operation

### 2.1 Facility Overview

The Facility is located in an existing IN3 Heavy Industrial Zone. The nearest commercial receiver is Starfish Learn to Swim located 150 m to the north at 26-28 Whyalla Place, Prestons. The nearest residential receivers are located at 301 Hoxton Park Road, about 450 m north of the Facility.

Access to the Facility is from Hoxton Park Road, Liverpool into Whyalla Place. The surrounding arterial roads include the M7 Motorway to the west and Hume Highway to the east.

The Site is approximately 9,100 m<sup>2</sup> and currently supports a warehouse building (~4,097 m<sup>2</sup>) and 650 m<sup>2</sup> office facility. The existing warehouse includes Compartment 1.

Once upgraded, the Facility will feature:

- An enclosed warehouse with a total floor area of 6,400 m<sup>2</sup> for unloading and handling of waste, with environmental controls including an air extraction system
- An office building with office space and amenities for workers
- Three weighbridges facilitating a single-direction heavy vehicle flow of traffic
- An extension to the Facility to accommodate an additional two Compartments. The three distinct compartments will include:
  - Compartment 1: Waste treatment storage, transfer bays and treatment of soil, muds and sludges, as well as dewatering plant, water tanks, wheel wash, weighbridge, reagent storage and leachate collection pits.
  - Compartment 2: Liquid Waste Treatment Plant (LWTP) and reagent storage.
  - Compartment 3: Mobile plant and equipment, cement silo, storage of packaged waste and resource recovery materials storage area.
- Two 8-metre-wide driveways to Whyalla Place for use by heavy vehicles and a third driveway for light vehicles, allowing for direct access to the carpark, separated from heavy vehicles.

The Facility will house the HiQ Group head office within the existing office space at the Site.

Figure 2-1 provides an overview of the Facility layout.



# PRESTONS WASTE TREATMENT FACILITY

## OPERATION ENVIRONMENTAL MANAGEMENT PLAN

Integrated Management System

ENV-M-20

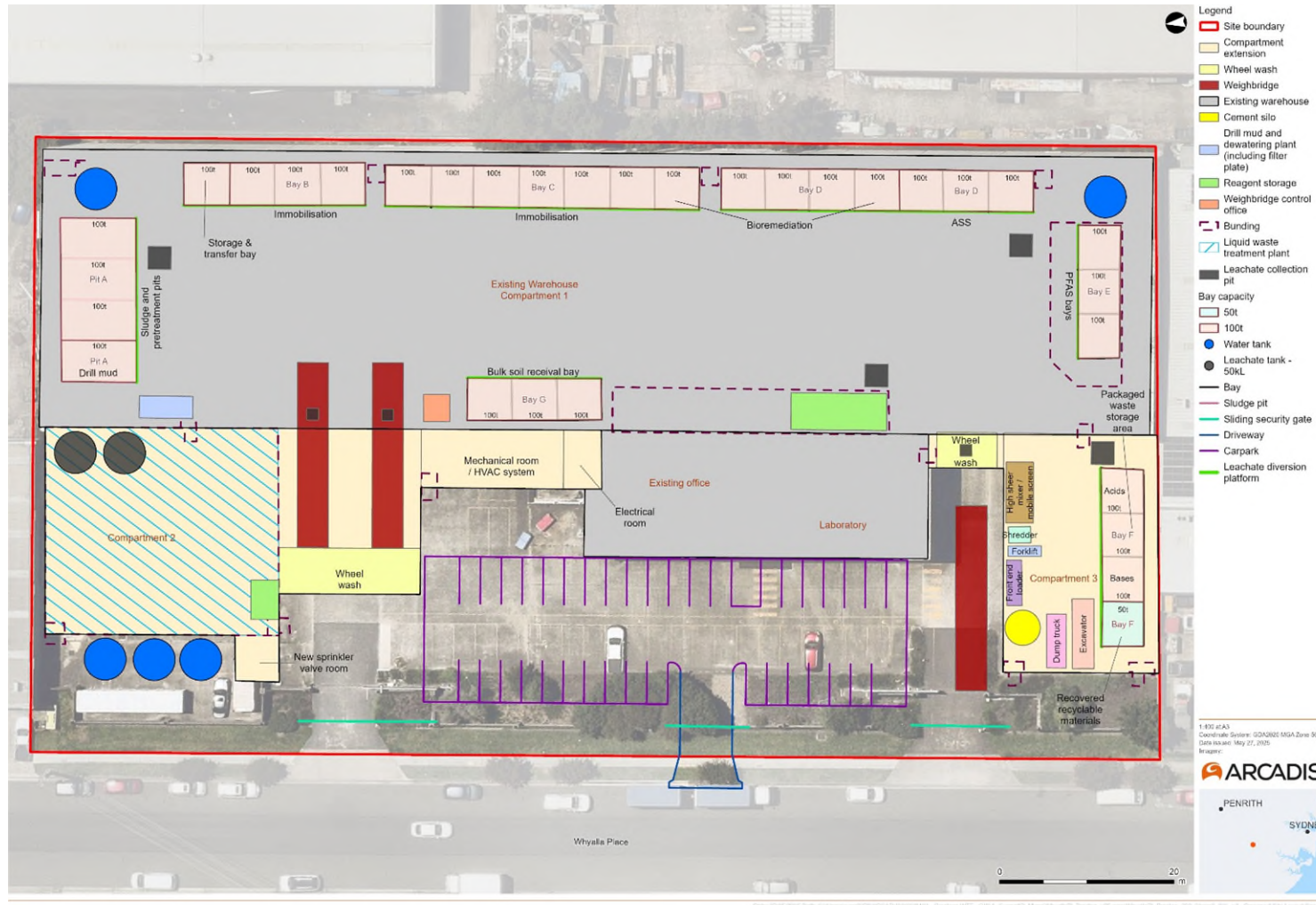


Figure 2-1: Conceptual Facility Layout [Drafting note: Figure to be updated as required during detailed design following project approval]



## 2.2 Operations Overview

A detailed OWMP has been prepared to outline the key operational requirements of the Facility. An overview of operations is provided in Figure 2-2 and described in the following sections.

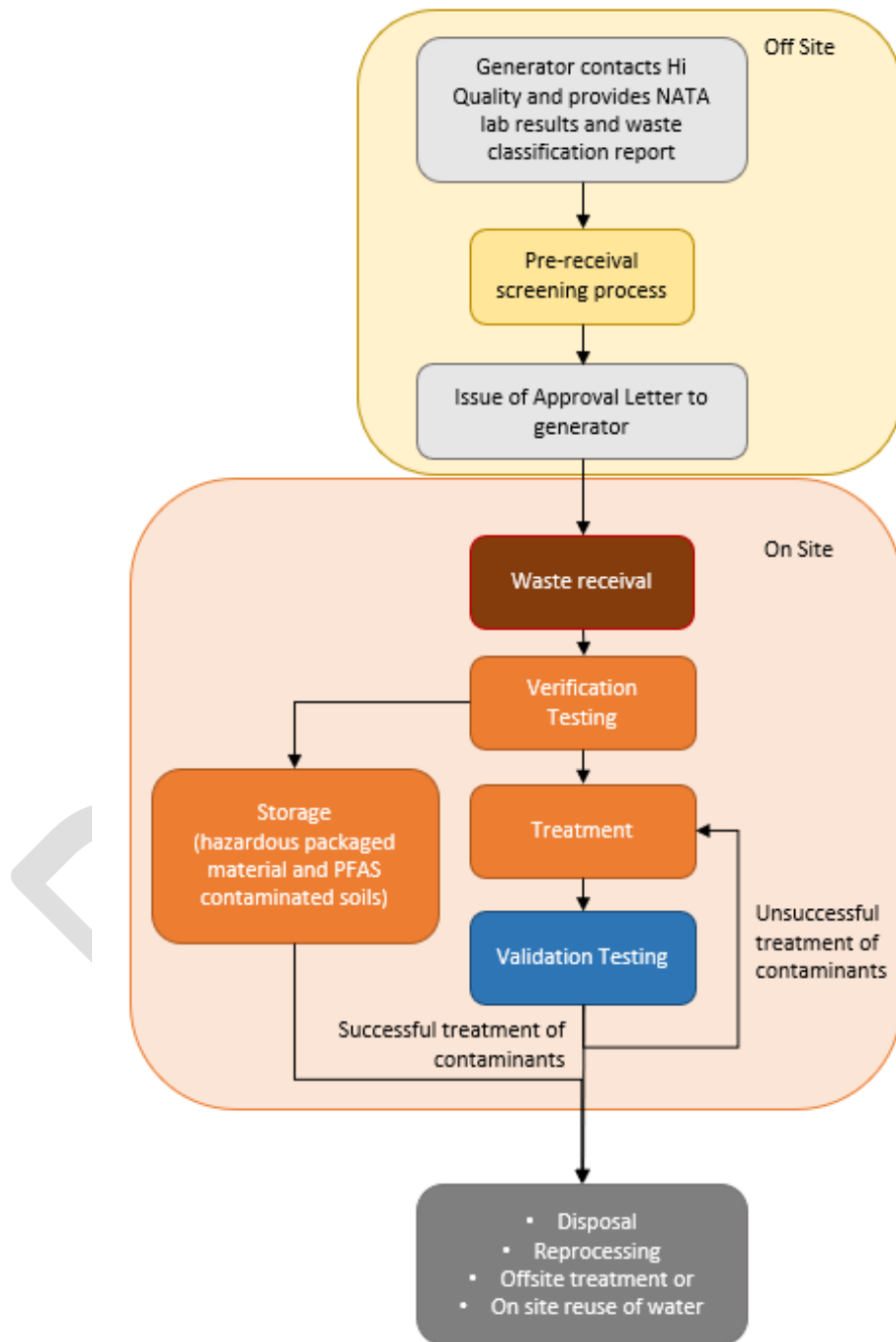


Figure 2-2: Operations overview



### 2.2.1 Wastes Accepted and Treated on Site

Wastes that are accepted at the Facility are categorised by either their nature or by the treatment method that will be applied. Within these waste types there may be a high degree of variability in the specific waste received. All waste accepted at the Facility will be screened and will comply with the relevant waste receipt procedure prior to acceptance at the Facility. More details on the waste types is provided in Section 4 of the Operational Waste Management Plan.

The WTF would utilise technologies aimed at treating waste to a level suitable for reuse, disposal to landfill or disposal to sewer. The Facility will process up to 210,500 tonnes of waste per annum including:

- Packaged waste
- Acid Sulfate Soils (ASS) and Potential Acid Sulfate Soils (PASS)
- Contaminated liquid and solid wastes.

Source material would primarily be generated from industrial processes and contaminated sites. Further detail on the waste types that will be accepted and treated on site is provided in Section 4.2 of the OWMP.

### 2.2.2 Waste Receipt and tracking

All incoming wastes enter via the entry weighbridge located at the northern most gate. The weighbridge(s) would be the primary location for tracking waste, including monitoring the quantity, type and source of waste received at the Facility, and the quantity, type and quality of the outputs produced at the Facility, with the exception of treated liquid waste discharged to sewer in accordance with Sydney Water requirements.

All wastes received at the Facility will be tracked from the waste generator through to the destination facility (e.g. landfill), consistent with the Protection of the Environment Operations (POEO) (Waste) Regulation 2014.

### 2.2.3 Non-Conforming Waste

The following materials are non-conforming waste that is to be automatically rejected:

- Scheduled PCB contaminated material as defined by the Polychlorinated biphenyl chemical control order (1997)
- PFAS contaminated soil above the restricted solid waste criteria
- Asbestos containing material (ACM)
- Wastes classified as Dangerous Goods, other than liquid waste and packaged waste classified as Class 8 PG II or III, or PFAS classified as Class 9 PG III.

A rejected loads register will be completed and maintained in accordance with HiQ's procedure.

In the unexpected event that materials received at the Facility meet the classification of ACM, the material would be subject to an unexpected finds procedure (refer to Appendix C of the OEMP) and removed from the Facility for appropriate disposal at a licensed facility.

Detailed weighbridge procedures for screening and acceptance of waste are described in Section 5 of the OWMP.



**2.2.4 Waste treatment and management processes**

Treatment methodologies for wastes include:

- Physical screening
- Chemical separation
- Bioremediation
- Immobilisation.

**2.2.5 Treatable Waste Categories**

The waste types that may be accepted by the WTF are outlined in Table 2-1, along with the likely treatment technologies. Further details on the treatment technologies and procedures used for each waste stream is provided in Section 6 of the OWMP.

Table 2-1: Summary of waste and proposed treatments

Type of Waste	Waste classification	Management	Tonnes per Annum
Packaged waste – Liquid	<ul style="list-style-type: none"> <li>• Liquid waste</li> </ul>	Contaminated packaged waste: no treatment, only storage	40,000t
Packaged waste – Solid	<ul style="list-style-type: none"> <li>• General solid non-putrescible</li> <li>• Restricted solid waste</li> </ul>	Non-contaminated waste: shredding and offtake for disposal	
PFAS contaminated soils	<ul style="list-style-type: none"> <li>• General solid non-putrescible</li> <li>• Restricted solid waste</li> </ul>	Storage only	7,500t
Bulk soils		Various methods:	58,000t
<i>Contaminated soils</i>	<ul style="list-style-type: none"> <li>• General solid waste (non-putrescible)</li> </ul>	<i>Primarily immobilisation</i>	50,000t
<i>Contaminated soils</i>	<ul style="list-style-type: none"> <li>• Restricted solid waste</li> <li>• Hazardous waste</li> </ul>	<i>Primarily bioremediation</i>	8,000t
ASS	<ul style="list-style-type: none"> <li>• Acid sulfate soils</li> </ul>	Acid neutralisation in batches	26,000t
Drill muds	<ul style="list-style-type: none"> <li>• General solid waste (non putrescible)</li> <li>• Liquid waste</li> </ul>	Dewatering and liquid waste treatment	2,000t
Sediments and sludges	<ul style="list-style-type: none"> <li>• Liquid waste</li> <li>• Restricted solid waste</li> <li>• Hazardous waste</li> </ul>	Dependent on moisture content of sludges – dewatering, liquid waste treatment and soil decontamination	7,000t
Liquid waste	<ul style="list-style-type: none"> <li>• Liquid waste</li> <li>• Restricted solid waste</li> </ul>	Treated and validated in 50 kL batches through the LWTP	70 ML
<b>Total</b>			<b>210,500</b>



### 2.2.6 Offtake of Waste

Following treatment, wastes processed at the WTF will undergo validation testing and final waste classification and reporting to determine if wastes destined for landfill are compliant with chemical composition acceptance criteria.

The final test of materials prior to offtake will be summarised in a Waste Classification and Validation report that includes:

- Analytical Results
- A summary of NATA accredited lab reports against batch records
- A validation report for waste supplier and landfill
- Compilation of waste disposal facility documentation, including field testing (where applicable).

Offtake will occur between 7am and 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays. Treated or stored materials at the Facility will be reprocessed, reused or disposed of, as described below. More details are provided in Section 7 of the OWMP.

## 2.3 Operational supporting systems

### 2.3.1 Stormwater Management System

The stormwater management system would ensure segregation between clean stormwater runoff and potentially contaminated runoff. All stormwater collected from the concrete hardstand will run through an interceptor trap, prior to leaving the Facility. The interceptor pit includes a gate valve that can be manually closed in the event of an incident to prevent spills going offsite. Opportunities for rainwater collection and reuse will be investigated during detailed design and implemented onsite where feasible.

Stormwater management will be detailed in the Operational Stormwater and Leachate Management Plan (OSWLMP) which will be developed for the Project.

### 2.3.2 Leachate Management System

Leachate collection pits will be installed below ground within the building to collect potentially contaminated runoff. Collected run-off will be transferred to one of two 50KL temporary holding tanks. Any leachate generated within the designated PFAS bays will be pumped into separate Intermediate Bulk Containers (IBC) via a portable pump.

Once a trade wastewater licence from Sydney Water is approved, a connection to sewer will be installed. If the collected leachate meets the requirements of the trade wastewater licence it will be discharged to Sydney Water sewer.

Any leachate that does not meet the trade waste criteria set by Sydney Water will be tankered offsite for disposal at an appropriately licenced site. The leachate collection pits will be located below ground.

In the event that a Trade Waste Agreement cannot be obtained (either for part or all of the proposed discharge volumes) treated liquid waste would be collected in tankers and removed offsite for disposal at a Sewage Treatment Plant (STP) or Liquid Waste Treatment Plant.

Leachate management will be detailed in the OSWLMP which will be developed for the Project.



### 2.3.3 Fire Protection

Fire protection and suppression infrastructure are integrated into the proposed building design in accordance with the *Fire Safety Guidelines: Fire safety in waste facilities* (Fire and Rescue, 2020), including:

- Portable fire extinguishers provided throughout the building (in accordance with the National Construction Code (NCC) and selected, located and distributed in accordance with AS 2444:2001)
- A dedicated smoke exhaust system in Fire Compartment 1 (within the existing warehouse building) and Fire Compartment 3 (the southern warehouse building extension) would be implemented to comply with the NCC
- Access for firefighters and emergency vehicles
- Sprinkler and Fire Hydrant System design (including appropriate water pressure)
- Fire detection and alarm system
- Fire Water Run-Off Containment
- Stockpile location and size compliant in accordance with the Fire Rescue NSW (FRNSW) *Fire Safety in Waste Facilities* Guidelines.

The fire system will include:

- Main Fire Indicator Panel located in the office of the Ground Floor
- New sprinkler booster assembly located along the truck entryway to the building adjacent the proposed sprinkler valve room.
- A new hydrant booster assembly.

Fire incidents will be managed in accordance with the Emergency Management Plan (Appendix B) and all staff will receive training in emergency procedures and evacuation routes. Fire wardens would be nominated.

### 2.3.4 Hazardous Chemical and Reagent Storage

Reagents are chemicals or mixtures which will be used in chemical analysis and reactions and will be used at the Facility to treat contaminated soils and water. Appropriate onsite storage will be provided as described in Table 2-2. Table 2-3 lists the materials and maximum quantities that will be stored at the Facility.

Table 2-2: Storage for reagents

Reagent	Storage	Location
Cement	Silos	Located in the southern warehouse building extension and fitted with overflow protection including a high-level alarm.
Corrosive substances (Class 8)	Stored and handled in accordance with AS 3780-2008	Stored on elevated racking, above the PMF level
Liquids	IBC	Storage area adjacent to the office and amenities block internal to the shed.
Powders	Stored in bags located in a storage area	Storage area adjacent to the office and amenities block internal to the shed.



**PRESTONS WASTE TREATMENT FACILITY**  
**OPERATION ENVIRONMENTAL MANAGEMENT PLAN**  
 Integrated Management System

**ENV-M-20**

Table 2-3: Materials stored at the Facility

Material	Maximum Quantity
Cement (stored within cement silo see Figure 2-1)	50 t
<b>Reagents</b>	
Ferrous sulphate (powdered)	5 t
Bacteria (stored in liquid form)	1 t
Urea	5 t
Super phosphate (powdered)	5 t
Biodegradable surfactant	2 t
Polymer (powder or liquid)	2 t
Finely crushed limestone or 'aglime'	20 t
Primary cementitious stabilising agents (Ordinary Portland Cement (OPC), Ground Granulated Blast-furnace Slag (GGBFS), pulverised fuel ash, cement kiln dust)	50 t
Secondary stabilising agents (Lime, sodium silicate, carbons, organophilic clays, natural pozzolans, bentonites)	50 t
Aluminium sulphate (28% w/w or powdered)	5 t
Hydrochloric acid (37% w/w) (DG Class 8)	5 t*
Magnesium oxide (powdered)	5 t
Decon 90	1 t
Liquinox	1 t
In addition, the following reagents and volumes would be stored at the Liquid Waste Treatment Plant compartment within the bunded chemical dosing area:	
Caustic soda	5 t*
Aluminium sulfate	2 t
Polymer	2 t
Activated Carbon	2 t
Magnesium Oxide	2 t
Ferrous sulfate	2 t

\* No more than a combined total of 10 t of hydrochloric acid and caustic soda will be stored on site at any given time.

Further details on storage requirements for reagents is outlined in the OWMP.



### 2.3.5 HVAC and Air Emissions Control System

All air from inside the WTF building is drawn through an emissions control system and is treated prior to discharge. As detailed in the EIS (Golder, 2021), contaminated air is drawn from each area (Compartments 1, 2 and 3) and is routed to the common inlet plenum for the heating, ventilation and air conditioning (HVAC) emissions control system.

The air emissions control system and strobic fans are located in, and on, the small compartment outside the “storage and transfer bays” along the western wall of Compartment 1.

Compartment 1 is served by a series of overhead vents along the north wall. These are designed to draw contaminated air from near the emitting activities and route this air to the common inlet plenum for the air emissions control system.

The maximum air exchange through the system will be 52.6 m<sup>3</sup>/s vented from the building through the three strobic exhaust fans. Each fan is associated with an individual stack and therefore the flow rate through each ventilation outlet is 17.5 m<sup>3</sup>/s.

The HVAC and Air Emissions Control System is described in more detail in Section 2 of the OAQMP.

### 2.4 Operating Hours

The WTF would receive waste 24 hours a day.

Processing and dispatch operations would be undertaken between:

- 7:00 am to 6:00 pm Monday to Saturday and
- 8:00 am to 6:00 pm Sundays and Public Holidays.



### 3 ENVIRONMENTAL REQUIREMENTS

Operation of the WTF is required to comply with all relevant legislation, permits, licences and development approvals that apply to the Facility.

This section provides an overview of the environmental planning and statutory context for the operations of the Facility. It also describes the WTF operations in the context of HiQ's corporate environmental and sustainability policies.

Compliance to applicable regulatory requirements concerning the operations of the WTF will be achieved through:

- Identifying and accessing legal and other requirements which are directly applicable to the organisation
- Consulting and involving relevant government agencies
- Internally communicating relevant information regarding legal and other requirements
- Continually auditing, reviewing and upgrading company systems, management plans and supporting documentation
- Providing relevant training.

#### 3.1 Applicable Legislation

##### 3.1.1 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) aims to manage pollution and waste disposal in NSW, and is administered by the NSW EPA. Part 1 of Schedule 1 of the POEO Act defines premise based scheduled activities that require an Environment Protection Licence (EPL).

The Facility will require an EPL under the POEO Act. This will be considered as part of the State Significant Development assessment process [Drafting note: To be updated if an EPL is required].

##### 3.1.2 Protection of the Environment Operations (Waste) Regulation 2014

The Protection of the POEO (Waste) Regulation requires tracking of certain waste within NSW and between participating States. Each party must be authorised to store, transport, or receive the specific type of waste. Schedule 1 of the POEO (Waste) Regulation identifies the types of waste which apply. In addition, the POEO (Waste) Regulation has specific reporting and record-keeping requirements. It is an offence under the POEO Act to wilfully or negligently dispose of waste in a manner that harms or is likely to harm the environment.

The POEO (Waste) Regulation also prescribes the requirements for recording information relating to:

- The delivery of waste or other material at scheduled waste facilities
- Loads of waste or other material transported from the Facility for use, recovery, recycling, processing or disposal at another place
- Other vehicles entering the Facility for a purpose related to the operation of the Facility.

As per Clause 15 of the POEO (Waste) Regulation, a weighbridge will be installed to ensure that the quantity of waste being transported to and from the Facility is correctly recorded.

Immobilisation approvals will be required for the Facility in accordance with Part 10 of the POEO (Waste) Regulation.



### 3.1.3 Contaminated Lands Management Act 1997

The principal objective of the *Contaminated Land Management Act 1997* (CLM Act) is to establish a process for investigating and, where appropriate, remediating land that the EPA considers to be contaminated significantly enough to require regulation. The Act outlines investigative processes for land contamination should it occur on the premises.

The results of the Phase 1 Site Investigation and the Limited Phase 2 Site Investigation prepared as part of the EIS (Golder, November 2021), indicate that the overall potential for widespread significant soil or groundwater contamination at the Facility as low. The Facility currently presents a low risk to onsite and offsite receptors and is considered to be suitable for ongoing commercial/industrial land use.

### 3.1.4 Waste Avoidance and Resource Recovery Act 2001

The *Waste and Resource Recovery Act 2001* (WARR Act) is the principal piece of legislation governing waste and resource management in NSW. The Act seeks to maximise the utility of resources including waste and minimise disposal of resources to landfill.

### 3.1.5 Water Management Act 2000

The *Water Management Act 2000* (WM Act) aims to facilitate the sustainable and efficient use of water in such a way that benefits the environment and communities. The WM Act provides for the preparation of water management plans that outline arrangements for water sharing, water source protection and drainage management. The WM Act outlines the requirement of the Facility to practice safe water management practices to ensure polluted waters, should they occur on the premises, are contained and properly managed

### 3.1.6 National Greenhouse and Energy Reporting Act 2007

The *National Greenhouse and Energy Reporting Act 2007* (NGER Act) provides the legislative framework for the NGER Scheme which is a national framework for reporting greenhouse gas emissions, greenhouse gas projects and energy consumption and production by corporations in Australia. The Facility does not trigger the requirement for reporting greenhouse gas emissions for the Facility.

## 3.2 Application Guidelines

The WTF design and operating procedures documented have due regard to relevant guidelines and codes of practice including but not limited to:

- Waste Classification Guidelines – Part 1 (including Addendum): Classifying Waste, EPA, November 2014
- AS1940-2004 The Storage and Handling of Flammable and Combustible Liquids
- Controlled Waste National Environment Protection Measure (NEPM)<sup>1</sup>;
- Resource Recovery Orders and Resource Recovery Exemptions under Protection of the Environment Operations (Waste) Regulations 2014 (Clause 93)
- Noise Policy for Industry (2017)
- Industrial Noise Policy Application Notes (EPA, 2013)

<sup>1</sup> [National Environment Protection \(Movement of Controlled Waste between States and Territories\) Measure | National Environment Protection Council \(nepc.gov.au\)](https://www.nepc.gov.au/nepm)



- Road Noise Policy (EPA, 2011)
- Approved methods for the modelling and assessment of air pollutants in New South Wales (NSW EPA, 2022)
- Approved methods for the sampling and analysis of air pollutants in New South Wales (NSW DEC, 2006)
- Technical framework: Assessment and management of odour from stationary sources in NSW (NSW DEC, 2006)
- Technical notes: Assessment and management of odour from stationary sources in NSW (NSW DEC, 2006).

### 3.3 Development Consent

HiQ has submitted a State Significant Development (SSD) application (SSD 9346594) for the construction and operation of the WTF in accordance with Part 4, Division 4.7 of the EP&A Act. Once the WTF has been approved, Conditions of Consent will be issued by the DPHI which will identify measures that are required to [DRAFTING NOTE: text to be updated upon project approval]:

- Prevent, minimise, and/or offset adverse environmental impacts
- Set standards and performance measures for acceptable environmental performance
- Require regular monitoring and reporting
- Provide for the ongoing environmental management of the development.

*[Drafting note: This Section of the OEMP will be updated following the issuing of the Conditions of Consent]*

A summary of relevant conditions which relate to the development of the OEMP have been provided in Table 3-1. The table also provides a cross reference to where the Condition has been addressed in the OEMP. The remainder of the Conditions applicable to the operation of the Facility, have been provided in Appendix G.

Table 3-1: Anticipated Conditions of Consent relevant to the OEMP

Condition #	Requirement	Where addressed
TBC	The Applicant must prepare an Operation Environmental Management Plan (OEMP) to the satisfaction of the secretary. The OEMP must:	This Plan
	Be submitted to the Secretary for approval prior to the commencement of operation	This Plan
	Be prepared by a suitably qualified and experienced expert;	Document Control
	Provide the strategic framework for environmental management of the Development;	Section 3
	Identify the statutory approvals that apply to the Development.	Section 3.3 Section 3.4



**PRESTONS WASTE TREATMENT FACILITY**  
**OPERATION ENVIRONMENTAL MANAGEMENT PLAN**  
 Integrated Management System

**ENV-M-20**

Condition #	Requirement	Where addressed
TBC	Describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the Development;	Section 5.3 Table 4-1
TBC	Describe the procedures that would be implemented to: <ul style="list-style-type: none"> <li>keep the local community and relevant agencies informed about the operation and environmental performance of the Development;</li> </ul>	Section 5.8
TBC	<ul style="list-style-type: none"> <li>receive, handle, respond to, and record complaints;</li> </ul>	Section 5.9
TBC	<ul style="list-style-type: none"> <li>resolve any disputes that may arise;</li> </ul>	Section 5.9
TBC	<ul style="list-style-type: none"> <li>respond to any non-compliance;</li> </ul>	Section 5.12
TBC	<ul style="list-style-type: none"> <li>respond to emergencies; and</li> </ul>	Section 5.11
TBC	Prepare the following environmental management plans: <ul style="list-style-type: none"> <li>Operational Waste Management Plan</li> <li>Operational Air Quality Management Plan</li> <li>Operational Traffic Management Plan</li> <li>Emergency Response Plan</li> <li>Operational Stormwater and Leachate Management Plan</li> <li>Operational Noise and Vibration Management Plan</li> </ul>	Section 1.3 OWMP OAQMP OTMP ERP (Appendix B) OSLMP ONVMP
TBC	Not commence operation until the OEMP is approved by the Secretary; and	Section 1.4
TBC	Operate the Development in accordance with the OEMP approved by the Secretary (and as revised and approved by the Secretary from time to time)	Section 1.4





**PRESTONS WASTE TREATMENT FACILITY**  
**OPERATION ENVIRONMENTAL MANAGEMENT PLAN**  
 Integrated Management System

**ENV-M-20**

REMM	Requirement	Where addressed
	<ul style="list-style-type: none"> <li>• Use and maintenance of personal protective equipment</li> <li>• Personal hygiene and clothes change policy</li> <li>• Incidents and first response</li> <li>• Personal decontamination (safety showers)</li> <li>• Spill response</li> <li>• Site critical controls</li> <li>• Workplace monitoring</li> </ul>	
FIM3	<p>An Emergency Response Plan will be developed in accordance with Hazardous Industry Planning Advisory Paper No 1: Emergency Planning (DPIE, 2011), and all staff will receive training in emergency procedures including the Emergency Response Procedures and delegated fire wardens, the evacuation routes, and the procedures to follow in a fire event. Flood emergency management will be incorporated into the plan with a shelter-in-place strategy adopted for the Site during any flood events. This will be documented within an Emergency Response Plan (ERP) as part of the OEMP for the Project and be in accordance with Work Health and Safety (WHS) legislation and AS3745:2010.</p>	ERP Appendix B

### 3.5 Permits and Licences

A summary of the key permits and licences applicable to the Facility, in addition to the Condition of Consent and REMMs, is provided in Table 3-3. [Drafting note: EPL to be issued by EPA]

Table 3-3: Key permits and licences

Licence / Permit Number	Licence	Regulator	Issued Date	Review Date
TBC	Trade Waste Agreement	Sydney Water	TBC	TBC
TBC	Environment Protection Licence (EPL)	NSW EPA	TBC	TBC



## 4 OPERATIONAL ENVIRONMENTAL IMPACTS

This section addresses the key risks and environmental performance issues associated with the operation of the WTF and the environmental controls established to manage the key risks.

### 4.1 Risk Assessment

As per HiQ’s Environmental Management System (EMS), key risks are to be identified and regularly reviewed regarding activities at the Facility. A Hazard Risk Assessment has been prepared for the Facility (Sherpa 2024) (Appendix L to the Amendment Report). Table 4-1 details the related risk assessments for the Facility. The operational risk register is provided in Appendix H and includes safety and environmental risks and controls.

[Drafting note: To be updated as risk register is periodically reviewed and updates]

Table 4-1 Relevant risk assessments

Risk register / report	Prepared by	Reviewed by	Date
Risk Register	Sherpa	Daniel Blair (HiQ) Jason Welch (HiQ)	12/09/2024
Liquid and Hazardous Waste Risk and Minimisation Report	Arcadis	Dan Blair (HiQ) Jason Welch (HiQ)	15/09/2024

### 4.2 Operational Environmental Impacts

Contractors undertaking site activities at the WTF on behalf of HiQ will be required to work under this OEMP but may utilise their own business and risk management systems and processes to develop any necessary site-specific safety and environmental management documentation and induction materials. The developed documentation and materials are to take into account the activity risk assessment, any relevant mitigation measures and any site / task specific risks that may require other or additional mitigation measures and controls to be applied.

Environmental impacts associated with the day-to-day operations of the Facility are:

- Generation of operational waste
- Access, traffic and parking
- Noise and vibration from operations
- Air quality
- Water management and water usage
- Hazards (storage of hazardous material and dangerous goods)
- Human health.

These impacts are described in more detail below.



### 4.3 Waste Management

An OWMP has been prepared that describes specific procedures for weighbridge activities and reporting, treatment and tipping procedures, management of non-conforming loads and materials, operational contingencies and processes for assessing treatability of waste to be accepted at the WTF. This is provided in Appendix F.

The waste streams generated at the WTF, other than those generated through the waste treatment processes described in Section 2, comprises of general waste from operational staff and used reagent packaging. Table 4-2 summarises the waste likely to be generated during operation of the WTF.

*Table 4-2: Operational waste types*

Waste type	Waste Identified	Waste Description	Storage	Disposal / Reuse
General solid waste (putrescible)	Site office waste	Paper, cardboard co-mingled waste	2m <sup>3</sup> skip bins within the building	Offsite recycling
General solid waste (putrescible)	Site office waste	Generated from work, including lunch packaging	2m <sup>3</sup> skip bins within the building	Offsite disposal
Various	Packaging material	Used reagent packaging generated from operation	Remain within bunding until collected	Under no circumstance to be included in the general waste bin Reuse where possible

#### 4.3.1 Mitigation measures

The *Liverpool City Council Development Control Plan 2008* (Liverpool DCP) requires the design of the garbage/waste storage areas to comply with the following:

- The rooms shall be fully enclosed with concrete floor and concrete or cement rendered walls to the floor
- A hose cock for hosing the garbage bin bay and a sewer drainage point in or adjacent to the bin storage area shall be provided. The drainage point should have a fine grade drain cover sufficient to prevent coarse pollutants from entering the sewer. If the hose cock is located inside the bin storage bay, it is not to protrude into the space indicated for the placement of bins
- The room shall have a floor waste, which is to consist of a removable basket within a fixed basket arrestor and is to comply with Sydney Water requirements
- The room must include a tight-fitting, self-closing door and mechanical ventilation.



#### 4.4 Access, Traffic and Parking

As described in Section 8 of the EIS, separate access points are proposed for trucks and light vehicles.

Trucks accessing the WTF will perform a right-turn from Whyalla Place into the Facility at the northern driveway and will proceed to one of two entry weighbridges. These vehicles will reverse into loading and unloading areas. After unloading, trucks will proceed in a clockwise direction to the exit weighbridge and perform a left-out at the southern driveway to exit the Facility. (See Figure 2-1).

Employees will access the Facility car park from Whyalla Road via a secure gate from the driveway between the truck entry and exit driveways. This parking area is for employees only. Thirty six car parking spaces will be available; 22 for office employees and 14 for staff working at the WTF. Parking includes one disabled parking space.

##### 4.4.1 Mitigation measures

Traffic impacts will be managed in accordance with the Operational Transport Management Plan (OTMP). This is provided in Appendix D of this OEMP.

#### 4.5 Noise and Vibration

##### 4.5.1 Noise

To support the preparation of the RtS the noise and vibration assessment carried out as part of the EIS (Golder, 2021) was updated. The results of a noise assessment undertaken as part of the RtS indicated that operational noise emissions from the WTF would fully comply with the calculated Project Noise Trigger Level (PNTL) and the relevant noise criteria at the identified sensitive receivers under noise-enhancing meteorological conditions.

Potential traffic noise associated with truck movements generated during operation of the WTF was assessed as unlikely to have a perceivable effect on the existing noise sensitive receivers and complied with relevant noise targets at all assessment locations.

The nearest residential assessment locations are greater than 350 m from the Facility and the nearest commercial property is approximately 70 m from the Facility, with all other noise sensitive locations being greater than 300 m from the Facility. Operation at the Facility is not anticipated to generate significant vibration impacts offsite.

##### 4.5.2 Noise mitigation measures

[Drafting note: A Noise and Vibration Management Plan (ONVMP) will be prepared following project approval and will include the following:

- Identification of the surrounding noise-sensitive land use
- A description of working hours and practices to minimise noise
- A list of high noise equipment or processes along with mitigation/minimising measures where possible
- Plant and equipment will be selected and maintained to achieve the sound power levels outlined in the Noise Assessment (EIS, 2021).
- A community complaints register and written process for handling complaints.

Typical noise mitigation measures will include, but not limited to:

- Plant and equipment will be selected to achieve the sound power levels outlined in the Noise Assessment (Appendix F of the RtS).



# PRESTONS WASTE TREATMENT FACILITY

## OPERATION ENVIRONMENTAL MANAGEMENT PLAN

Integrated Management System

ENV-M-20

- Plant and equipment will be maintained and not generate excessive noise.
- Broadband reversing alarms will be utilised in place of traditional beeper reversing alarms.
- Machinery will be operated in a manner that reduces maximum noise level events.
- Site awareness training / environmental inductions will include a section on noise mitigation techniques / measures to be implemented when on the Site.]

### 4.5.3 Vibration

As described in Section 9 of the EIS, vibration impacts during operation are considered to be negligible and unlikely to have any potential impact on sensitive receivers during operation. Nonetheless, details of control measures to minimise potential vibration impacts will be outlined in the ONVMP.

## 4.6 Air Quality

An Air Quality Impact Assessment (AQIA) was completed as part of the EIS (2021). An addendum AQIA was prepared to support the RtS for the Proposal in September 2022, which also included a quantitative odour assessment. Further clarifications of the air quality impact assessment were included in the Amendment Report (Arcadis 2024). The maximum predicted ground level concentration of pollutants and individual toxic pollutants generated by the WTF were each modelled outside the Facility boundary at gridded sensitive receptors.

The AQIA states that the ventilation stacks at the Facility serve as an air emissions control device that include filters to reduce particulate matter emissions and activated carbon to reduce emissions of volatile organic compounds (VOCs) and odour. A quantitative odour assessment in the addendum AQIA prepared in 2022 determined that all receptors are below the criterion.

Particulate matter, VOC and odour emissions from the WTF will be mitigated using engineering controls (e.g. use of vents, sealed vessels, vapour recovery systems etc), as well as management controls including policies and procedures designed to reduce the generation of PM and VOC emissions.

### 4.6.1 Mitigation measures

Air quality impacts will be managed in accordance with the Operational Air Quality Management Plan (OAQMP). This is provided in Appendix E of this OEMP. The OAQMP describes HVAC air emissions control system, air quality, odour and health management, monitoring procedures and mitigation measures. Mitigation measures are provided in Section 7.4 of the OAQMP.

## 4.7 Soil and Water

### 4.7.1 Drainage and runoff

The existing drainage system at the Facility manages runoff from the carpark and roof areas and discharges into the Council's drainage network. A series of existing down pipes convey runoff from the warehouse and office roof into the existing 150 mm diameter drains. Part of this runoff and runoff from the carpark area is captured by grated stormwater pits and then is conveyed to the 375 mm diameter Council drain that runs along the eastern boundary of the Facility. The rest of the warehouse runoff (from the eastern portion of the roof) is conveyed directly into the same Council drain.

During operation, it is proposed that part of the runoff from the warehouse roof will be captured in a rainwater storage tank to be used for onsite activities (if applicable).

Potential impacts on surface or groundwater water quality include:



- Liquid waste contamination of surface water
- Spillage or uncontrolled releases of pollutants.

The key design to protect water quality includes the segregation of clean stormwater from potentially contaminated materials and liquid waste and protection of the groundwater through bunding, containment and barrier systems. Rainwater will be collected from the warehouse roof and will be reused during operations at the Facility.

#### 4.7.2 Flooding

The Liverpool DCP flood mapping identified that the western portion of the Facility is located within 'flood planning area', below the 1% annual exceedance probability (AEP) maximum flood level plus 0.5 m freeboard. The finished floor level for new buildings at the Facility is estimated at 23.6 metres Australian Height Datum (mAHD) i.e. the maximum 1% AEP flood level at the Facility of 23.1 mAHD plus 0.5 m freeboard above the flood planning area noted in the Liverpool DCP.

As a precautionary measure, all chemicals and reagents that are classified as Dangerous Goods Class 8 PG II and III materials will be stored on platforms and/or shelving above the probable maximum flood (PMF) level and stockpiling areas will be bunded and have leachate platforms diversions to prevent any material leaving the Facility.

Additionally, when an extreme flood event is forecast, the Facility will cease to receive 'Hazardous' waste material. The Facility would also make arrangements to transport any 'Hazardous' waste currently at the Facility to an alternative site prior to a high rainfall event.

#### 4.7.3 Mitigation measures

[Drafting note: A Stormwater and Leachate Management Plan (OSWMP) will be prepared prior to operations commencing if required by CoC]

Management of soils and water during operation will include, but not limited to:

- All materials and process water will be wholly contained within the bunded building and separate from the stormwater system (as a closed system)
- The storage and handling of materials will be undertaken inside the WTF building
- The doorways of the building will be bunded with drive-over bunding and will be of sufficient capacity to contain one tanker load of liquid
- Leachate will be collected within the WTF
- The floor of the WTF is concrete with centrally located collection pits so that all spills and contamination will be contained within the building. Water collected is directed to the liquid waste treatment plant.
- Liquid waste treatment plant tanks will be equipped with high level alarms etc to prevent overflow.
- Chemicals and dangerous goods will be stored in bunded areas in accordance with Australian Standards
- All tanks will include overflow protection and alarms
- All treatment chemicals will be applied via enclosed automated dosing systems minimising the potential for spills
- All above-ground pre-treatment pits will be lined and regularly inspected and epoxy liner and concrete repair implemented as required
- All bunding will be inspected on a regular basis
- No washdown will be undertaken in the building to minimise the generation of liquid waste



- Spill kits will be located adjacent to potentially contaminating activities
- All spills will be managed in accorded with the Pollution Incident Response Management Plan (PIRMP) and **incident management procedures**.

#### 4.8 Hazards

The WTF operations have the potential to contaminate land and water in and surrounding the Facility area by the release of various chemicals stored and/or used onsite. However, the operations of the WTF did not trigger the requirement for a PHA during preparation of the EIS and Amendment report, and operations are not considered to be potentially hazardous.

##### 4.8.1 Mitigation measures

Regardless, a number of mitigation and management measures will be implemented to reduce the risk of hazardous substances escaping into the local waterways or soil.

The key design will include protection of surface water and groundwater would be through bunding, containment and barrier systems on raised platforms and/or shelving.

Storage and handling of dangerous goods will be undertaken in accordance with the relevant Australian Standards:

- Corrosive substances (Class 8) will be stored and handled in accordance with AS 3780-2008: *The storage and handling of corrosive substances*.

#### 4.9 Human Health

Source material will be primarily generated from industrial processes and contaminated sites. Treatment of these wastes will generally focus on the destruction of contaminants (e.g. bioremediation and/or immobilisation) or the separation of contaminants (e.g. screening, chemical separation) from recoverable or more inert constituents. Waste streams include organics, halogenated hydrocarbons metals and metalloids and other specific waste streams.

The health consequence of exposure to the various contaminants and hazards depends on:

- Dose of contaminant or level of hazard
- Toxicity or health effect of the contaminant or hazard
- Duration of exposure
- Sensitivity of the population exposed.

These factors are variable depending upon the individual characteristics of the contaminants or hazard, the exposure pathway. Other potential health hazards and potential impacts to human health include dust, noise and odour generated during operation.

##### 4.9.1 Mitigation measures

HiQ has an established comprehensive corporate health and safety management system which aligns with *AS/NZS ISO 45001:2018 Occupational Health and Safety Management Systems –Requirements with Guidance for use*.

Health monitoring requirements specific to air quality and odour management is described in the OAQMP (Appendix E of this OEMP).



#### 4.10 Water Usage

Potable water usage for the WTF and ancillary facilities is anticipated to be around 126.12 kL/year. This covers the water usage required for the kitchen and ablution facilities.

Total water usage for process applications and dust suppression is estimated to be around 4,000 kL/year. This includes:

- 1,000 kL/year for dust suppression and moisture conditions
- 2,500 kL/year for wheel wash and truck wash activities
- 500 kL/year for bioremediation.

Rainwater will be harvested from the WTF roof and will be used for process applications, dust suppression and wheel and truck wash.

#### 4.11 Other environmental issues

The EIS also identified environmental issues with low to very low level of risk. These have been summarised in Table 4-3 and proposed mitigation measures provided to minimise any potential impact arising through operation of the WTF.

*Table 4-3: Other low risk environmental impacts*

Aspect	Description	Mitigation Measures
Biodiversity	The WTF is located within an existing industrial area and is not identified in the <i>Liverpool Local Environment Plan 2008</i> (LEP) as containing biodiversity values  The Flora and Fauna assessment, undertaken for the EIS confirmed that the operation of the WTF would not have a significant impact on biodiversity.	Maintain minimum speed limit Keep bins covered to reduce the likelihood of animal scavenging
Cultural Heritage	The WTF is within an existing industrial area and consists of buildings and infrastructure, concrete drives and parking and landscaped area. During operation, the WTF will have negligible ground disturbance / excavation.	No disturbance of ground conditions across the Site during operation.
Visual	The WTF is predominantly screened by other buildings in adjacent properties to the north, east and south. The Facility has a 10-m setback to the primary frontage of Whyalla Place in accordance with the Liverpool DCP. This setback area includes onsite vegetation.	Maintain site vegetation Keep the Facility neat and tidy and clear of litter



# PRESTONS WASTE TREATMENT FACILITY OPERATION ENVIRONMENTAL MANAGEMENT PLAN

Integrated Management System

ENV-M-20

Aspect	Description	Mitigation Measures
	Whyalla Place was assessed as having low visual sensitivity and low visual effect due to being located within an existing heavy industrial area with typical traffic volumes and similar industrial land uses and the WTF will have negligible visual impacts on the surrounding area.	
Bushfire	The WTF is located within an existing industrial estate that is not identified as being bushfire prone land. Fire management will be predominantly undertaken within existing buildings	<b>Appropriate fire management procedures</b> Emergency response plan (Appendix B) Maintenance of vegetation

DRAFT



## 5 COMPLIANCE MANAGEMENT

### 5.1 SEQ Management System

HiQ's Quality system has documented procedures and processes for managing non-conforming work practices and initiating corrective/preventative actions or system improvements.

The HiQ Group manages its operations with strict adherence to safety compliance, quality systems and environmental performance and sustainability. HiQ Group has obtained ISO accreditation in:

- Quality Management System Scheme certificate - AS/NZS ISO 9001-2016
- Occupational Health and Safety Management System Scheme Certificate - AS/NZS 4801-2001 and AS/NZS ISO 45001-2018
- Environmental Management System Scheme Certificate - AS/NZS ISO 14001-2016.



### 5.2 Environment Policy

The HiQ Group recognises the importance of integral environmental management. We acknowledge that environmental management requires continual assessment and improvement. This is how we do business to enable us to work effectively in a diverse range of environments and community settings. Consistent with HiQ's Environmental Policy, the intended outcomes of HiQ's Environmental Management System (EMS) are for:

- Enhancement of environmental objectives
- Fulfilment of compliance obligations
- Achievement of environmental objectives.

### 5.3 Roles and Responsibilities

Table 5-1 presents roles and responsibilities for implementing the OEMP.

*Table 5-1: Environmental Roles and Responsibilities*

Role	Responsibilities
General Manager	<ul style="list-style-type: none"> <li>• Overall responsibility for implementation of the OEMP and monitoring the effectiveness of the OEMP and rectifying deficiencies in the OEMP</li> <li>• Oversee the implementation of the OEMP for the Facility</li> <li>• Regularly review site environmental performance and report as required</li> <li>• Oversee regular review and update of the OEMP</li> <li>• Liaison with external authorities and regulators as required</li> </ul>



# PRESTONS WASTE TREATMENT FACILITY

## OPERATION ENVIRONMENTAL MANAGEMENT PLAN

Integrated Management System

ENV-M-20

Role	Responsibilities
Site Manager	<ul style="list-style-type: none"> <li>• Implement the OEMP</li> <li>• Ensure subcontractors are inducted to and comply with the OEMP</li> <li>• Undertake and record regular site inspections</li> <li>• Implement preventative maintenance plan for plant and equipment, including weighbridges.</li> <li>• Monitor compliance with the OEMP</li> <li>• Ensure emergency response equipment is available onsite and maintained</li> <li>• Co-ordinate emergency responses as necessary</li> <li>• Undertake community liaison as required</li> <li>• Participate in environmental management reviews of the OEMP</li> <li>• Update and re-issue the OEMP as required</li> <li>• Liaise with relevant authorities regarding environmental management requirements</li> <li>• Complaints management</li> <li>• Raise, investigate and report non-compliances and implement corrective actions</li> </ul>
Technical Manager	<ul style="list-style-type: none"> <li>• Responsible for overseeing the testing and bench testing at the Facility</li> <li>• Responsible for issuing a Letter of Approvals to waste generators prior to receipt of waste deliveries at the facility.</li> </ul>
Environmental Manager	<ul style="list-style-type: none"> <li>• Participate in environmental management reviews of the OEMP</li> <li>• Engage the environmental consultant as and when required</li> <li>• Monitor overall environmental management performance of the Facility</li> <li>• Report compliance with regulatory requirements</li> <li>• Liaison with external authorities and regulators as required</li> </ul>
Operational Staff (Including weighbridge operators)	<ul style="list-style-type: none"> <li>• Undertake Material inspection, processing and screening</li> <li>• Identifying and handling of unacceptable materials</li> <li>• Undertake dust suppression and noise management as required</li> <li>• Management of surface water and ground water</li> <li>• Undertake the inspection and cleaning of vehicles leaving the Facility</li> <li>• Manage the operation, maintenance and servicing of plant &amp; equipment.</li> </ul>
Facility Chemist	<ul style="list-style-type: none"> <li>• Sampling, testing and validation of potential contaminants and materials entering the Facility in accordance with Australian Standards and HiQ procedures</li> <li>• Record keeping of all material and waste that has been sampled, tested and validated at the Facility.</li> </ul>



## 5.4 Inspections and Monitoring

Regular monitoring will be undertaken to monitor the performance of the environmental aspects. These will be through a series of formal and informal inspections at regular intervals. The OAQMP and OWMP describes waste and air quality inspection and monitoring procedures and timings.

### 5.4.1 Environmental Inspections

The Environmental Manager will undertake monthly environmental inspections of the Facility using the HiQ Environmental Checklist.

A summary of these inspections is included in Table 5-2.

*Table 5-2: Operational inspection regime*

Program Item	Type of Inspection/Testing	Frequency	Responsibility
Weighbridges	Certification/calibration	Annual	Site Manager
Site Inspection Housekeeping Checks	Inspection	Daily	Site Manager or nominated person
Air quality and odour	Inspection	Monthly	Environmental Manager

Any non-compliances will be recorded, and action plans or improvement plans developed. Action and/or improvement plans will be recorded within HiQ Rapid system with tasks/actions and timeframe for completion assigned to a relevant employee for close out and completion. If a potential non-compliance is identified during the inspection, the **Incident Management Procedure** will be implemented as described in Section 5.10.1.1.

### 5.4.2 Environmental Monitoring

The Conditions of Consent and the EPL will identify monitoring regimes which will need to be complied with. This Section will be updated following the Approval of the Project. The Environmental Manager will undertake the relevant monitoring requirements.

The OAQMP describes air quality and odour specific monitoring requirements. A summary of these inspections is included in Table 5-3.

*Table 5-3: Operational monitoring regime*

Monitoring Program Item	Type of Inspection/Testing	Frequency	Responsibility
Air quality	Stack testing	within the first year of operation  If post-commissioning stack testing indicates the model predictions are conservative, then stack testing will be repeated on a once-in-three years basis.	Site Manager



Monitoring Program Item	Type of Inspection/Testing	Frequency	Responsibility
Air quality	<ul style="list-style-type: none"> <li>• Particulate matter monitoring (PM2.5 and PM10)</li> <li>• Dust deposition gauge monitoring</li> <li>• Hydrocarbon or VOC monitoring</li> <li>• Total reduced sulfur compound or odour monitoring.</li> </ul>	If post-commissioning testing indicates that there is the potential for air impacts, then fence-line or local air quality monitoring will be undertaken.	Site Manager or nominated person

## 5.5 Reporting

### 5.5.1 External Reporting and Record Keeping Requirements

Compliance reporting will be undertaken to produce systematic, comprehensive and informative reports on the environmental performance of the WTF operations and in line with relevant legislative requirements. The reports required are summarised in Table 5-4. Reporting requirements that relate to specific environmental aspects are included in the relevant sub-plans (Appendices C-E).

[Drafting note: These reports are based on current experience with waste projects. The table will be updated once the conditions of consent are issued and reporting requirements identified]

Table 5-4: Reporting Requirements

Item	Reporting Requirements	Frequency	Responsible
Conditions of consent	Annual Review	Within 12 months from the commencement of operation, and each year thereafter or otherwise agreed by the Secretary	Environmental Manager
Conditions of consent	Incident Report	Within 24 hours days of the date of any incident or potential incident with actual or potential significant offsite impacts	Environmental Manager General Manager
Conditions of consent	Detailed Incident Report	No later than 14 days after incident or potential incident	Environmental Manager
Conditions of consent	Independent Environmental Audit Report	Within three months of commissioning audit, or as otherwise agreed by the Secretary	Auditor Environmental Manager



**PRESTONS WASTE TREATMENT FACILITY**  
**OPERATION ENVIRONMENTAL MANAGEMENT PLAN**  
 Integrated Management System

ENV-M-20

Item	Reporting Requirements	Frequency	Responsible
EPL	Annual Return	Within 60 days after the end of each reporting period (12 months after the issue of the licence, and each subsequent period of 12 months)	Environmental Manager

### 5.5.2 Internal Reporting and Record Keeping Requirements

Internal reporting and record keeping specific to HiQ obligations are detailed in Table 5-5.

Table 5-5: Internal reporting requirements

Subject	Action	Responsible	Frequency
OEMP	Distribute to Site Manager and EPA	Environmental Manager	Commencement of operations
Site Inspection	Record in Environmental Observations and Actions Checklist (Appendix A)	Site Manager	Weekly
Complaints	Record details (refer to Section 5.9)	Site Manager	As required
Complaints Response	Record details	Site Manager	As required
Non-Compliance	Issue notice to Environmental Manager	Site Manager	Immediately
Notification of Environmental Harm	Report to Environmental Manager and EPA (phone 131 555)	Site Manager	Immediately
	Report to NSW EPA in writing via <a href="mailto:info@epa.nsw.gov.au">info@epa.nsw.gov.au</a>	Environmental Manager	Within 2 working days
Audit	Report audit findings and distribute to Site Manager	Environmental Manager	Annually
OEMP Review	<ul style="list-style-type: none"> <li>• Meeting minutes</li> <li>• Record of review</li> <li>• OEMP updates</li> </ul>	Environmental Manager	Annually



The following records will be maintained for record-keeping purposes:

- The OEMP (current and superseded versions)
- Employee training and induction records
- Site inspection reports
- Maintenance and repair records performed on pollution control equipment (for a period of two years as per the conditions of approval)
- Waste disposal certificates for any regulated or controlled wastes disposed offsite (for a period of 1 year as per the conditions of approval)
- Records of VENM accepted at the Facility (for a period of two years as per the conditions of approval), including, material source, type, quantity, who delivered the material, certification of material and EPA approval number where applicable
- Weighbridge dockets (incoming and outgoing materials)
- Environmental monitoring records
- Monitoring equipment calibration reports
- Environmental incidents/emergencies reports
- Non-compliance reports
- Complaints register
- Audit reports
- Rejected loads register
- OEMP review minutes
- Regulatory authority inspection reports and correspondence with regulatory authorities.

## 5.6 Training and Competence

All personnel undertaking work at the WTF will undergo general environmental awareness training and training relevant to their responsibilities under this OEMP.

In addition to the induction program, training will be provided as deemed necessary to employees and contractors to provide them with the knowledge, skills and awareness to minimise environmental impact.

Targeted environmental awareness training will also be provided to individuals or groups of workers with a specific authority or responsibility for environmental management or those undertaking an activity with a high risk of environmental impact.

Records of environmental inductions and other environmental training will be maintained and readily accessible within the HiQ Safety, Health, Environment and Quality system.

### 5.6.1 Inductions

All employees and contractors are required to complete a HiQ general site induction and will be made aware of their environmental responsibilities. A record of all site inductions will be maintained in a training register and kept on-site. The site induction includes:

- An overview of the Facility Rules, Environment Policy and general environmental requirements
- Legal and other obligations
- Environmental incident and community compliant reporting requirements
- Emergency response procedures onsite
- Correct use of spill kit



- Environmental awareness of environmental protection responsibilities and measures to minimise environmental impacts

### 5.6.2 Human health training and inductions

All employees will be required to complete the Proponent's onboarding and induction system that includes health and safety training.

- Task based training will be provided and include a competency assessment process with personnel not being permitted to work unsupervised until deemed competent.
- Ongoing education and awareness will be provided through the Health & Safety Committee, personal monitoring result discussions, safety alerts and toolbox meetings.

The induction will include the following key health related elements:

- Dangerous Goods (storage and storage limits, handling and use)
- Contaminants (e.g. asbestos, PAHs, dust, vapours)
- Use and maintenance of personal protective equipment
- Personal hygiene and clothes change policy
- Incidents and first response
- Personal decontamination (safety showers)
- Spill Response
- Facility Critical Controls
- Workplace Monitoring.

### 5.6.3 Toolbox Talks

Toolbox talks will be used to raise awareness and educate employees and contractor on specific environmental issues including contaminated materials, waste management measures and other environmental issues relevant to the Facility.

Attendance at daily site Toolbox talks is mandatory and attendees of Toolbox talks are required to sign an attendance form. Records of Toolbox attendance is maintained within the HiQ Safety, Health, Environment and Quality system.

All site personnel will also be required to complete refresher training on an annual basis via a toolbox meeting.

Toolbox talks tailored to specific environmental issues include:

- Incident notification requirements
- Emergency and spill response
- Biodiversity, clearing controls and vegetation protection
- Weed management
- Noise and air quality controls
- Housekeeping and waste.

### 5.6.4 Other Targeted Environmental Awareness Training

Other environment related training is provided as needed to operational personnel and may include:

- Customer service
- Asbestos awareness and identification
- Excavation, loading and stockpiling of materials



- Material inspection, processing and screening
- Recording of material types, categories, volume
- Dust suppression and noise management
- Management of surface water and groundwater
- Compliance with environmental and project approval requirements
- Operation, maintenance and servicing of plant and equipment.

## 5.7 Auditing

### 5.7.1 Internal Audits

Internal audits will be undertaken to assess the effectiveness of environmental controls and compliance with this Plan and other relevant guidelines. The following elements may be included in the audit of the overall OEMP:

- Compliance with statutory obligations
- Compliance with standards, guidelines, specifications and contract conditions
- Compliance with the OEMP and PIRMP
- Adequacy of monitoring and operational reports
- Completion of environmental actions
- Adequacy of environmental training records
- Adequacy of environmental records, checklists and document management systems
- Preparation of environmental reports
- Recording and completion of corrective actions following environmental incidents and complaint
- Achievement of environmental performance objectives, and
- Implementation of actions from previous audits.

### 5.7.2 Independent Environmental Audit

In accordance with Condition XX, independent audit reporting for the Project will be in accordance with the *Independent Audit Post Approval Requirements* (DPHI, 2020). The auditing report will also be prepared in accordance with *AS/NZS ISO 19011:2014 - Guidelines for Auditing Management Systems*.  
[Drafting note: To be updated once approval is received]

The first independent environmental audit will be carried out within 12 weeks of the commencement of operation. Ongoing independent environmental audits will occur at intervals, no greater than 26 weeks from the date of the initial audit, or as agreed by the Secretary. However, the Secretary may request the independent audits to be completed at different times. If this occurs, the Secretary will give one month's notice to the HiQ of the date upon which the audit will be required.

The audit team will be led by a suitably qualified auditor and will include relevant experts whose appointment has been endorsed by the DPHI. HiQ will commission and pay for the audit to be conducted.

The audit report will be submitted to the DPHI, together with its response to any recommendations contained in the report including a timetable for implementation of the recommendations within three months of commissioning the Independent Environmental audit.



## 5.8 Communications

### 5.8.1 Internal Communication

Clear communication throughout all levels and functions, such as employees and contractors, is key to minimising environmental impacts and achieving continual improvements in environmental performance.

The Environment Manager will meet periodically with the Site Manager to discuss onsite environmental management, amendments to plans, environmental monitoring results and other relevant aspects of the operation.

The Environmental Manager will participate, as required, in toolbox talks to communicate with the site employees and contractors on environmental performance and to receive feedback on any areas for suggested improvements to environmental management of the Facility.

### 5.8.2 Communication with Agencies and Authorities

The Environmental Manager will be the main point of contact regarding specific environmental issues.

The Environmental Manager has the responsibility to report on the ongoing environmental performance of the Facility to agencies and authorities.

## 5.9 Complaints Management

A telephone complaints line is available during operating hours to receive complaints from members of the public.

**Telephone: 1800 261 666**

**Email address: [community@hiquality.com.au](mailto:community@hiquality.com.au)**

The public will be notified of the complaints line number such that the impacted community knows how to lodge a complaint.

If an environmental complaint (such as a complaint regarding noise or pollution) is received during operations at the Facility, the Site Manager is to be immediately notified. The Site Manager will then prepare a written report and enter the complaint into the electronic database within 24 hours.

HiQ will keep a written record of all complaints. The record will include:

- Date and time of complaint
- Method by which the complaint was made
- Any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect
- The nature of the complaint
- The action taken by HiQ in relation to the complaint, including any follow up contact with the complainant
- If no action was taken by HiQ, the reasons why no action was taken.



### 5.10 Incident Management

Incidents are occurrences that cause or threaten to cause material harm, where material harm is defined as:

- Harm that involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial, or
- Harm that results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment), or
- Have the potential to, or do, impact on one or more protected matter(s) or
- A pollution incident as detailed in Part 5.7 of the POEO Act.

All environmental incidents will be managed in accordance with the flowchart shown in Figure 5-1.

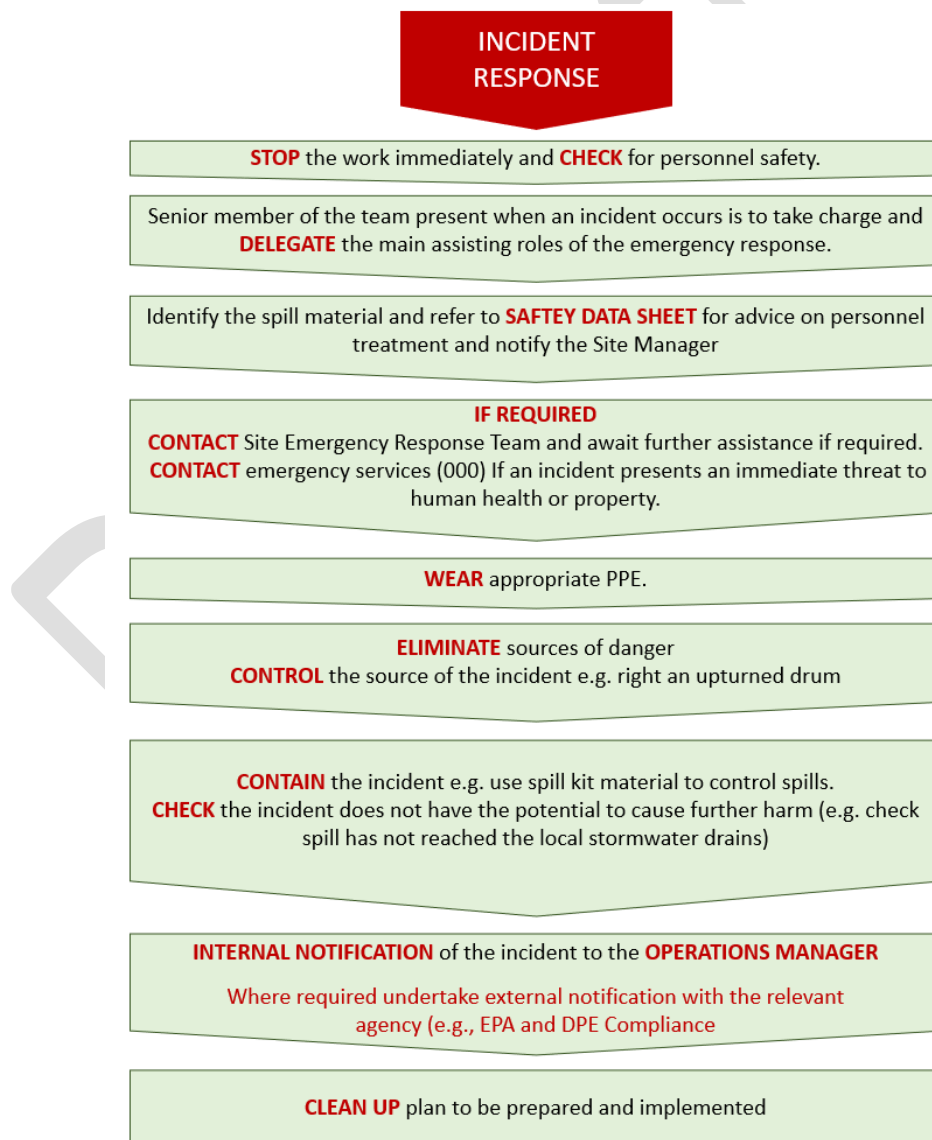


Figure 5-1: Environmental Incident Response Flowchart



#### 5.10.1.1 Incident Notification Requirements

Incident notification processes will reflect the extent of the event and the incident classification.

Regulatory Authorities will be notified of reportable incidents in accordance with the requirements of the Condition XX. Records of incidents will be maintained by the Site Manager and will include details of which external authority was contacted and what information provided.

*[Drafting note: Below is anticipated a part of Conditions of Consent – to be updated if required]*

#### 5.10.1.2 Incident Notification

If an environmental incident occurs, the WTF workers will immediately notify one or more of the Emergency Contacts, listed in Table 5-6. That person/s will then decide whether to notify DPHI, EPA or both. If these regulators are notified, other regulatory authorities that also require notification under the PIRMP may include:

- Local council
- Ministry of Health
- Fire and Rescue NSW
- SafeWork NSW
- Any other relevant authorities
- Third Party land holders (where appropriate).

Section 150 of the POEO Act provides the information that needs to be notified, being:

1. The time, date, nature, duration and location of the incident
2. The location of the place where pollution is occurring or is likely to occur, the nature, the estimated quantity or volume and the concentration of any pollutants involved, if known
3. The circumstances in which the incident occurred (including the cause of the incident, if known)
4. The action taken or proposed to be taken to deal with the incident and any resulting pollution or threatened pollution, if known
5. Other information prescribed by the regulations.

Complying with these notification requirements does not remove the need to comply with any other legislative requirements for incident notification (e.g. requirements under the conditions of an EPL or the *Work Health and Safety Act 2011*).

#### DPHI Notification

If it is determined that the DPHI, EPA or both authorities require notification, this will be undertaken in accordance with the requirements of Condition XX. This requires that the DPHI is notified within 24 hours of the incident or potential incident occurring. *[Drafting note: To be updated once approval is received]*

A further detailed report must be prepared following investigations of the causes and identification of necessary additional preventive measures and submitted to the DPHI no later than 30 days after the incident or potential incident.

Where required, due to the severity or ongoing nature of the incident, investigations will be conducted and action plans established to ensure that the incident does not occur again.

Environmental investigations will include:



- Identification of the cause, extent and responsibility of the incident
- Identification and implementation of the necessary corrective action
- Identification of the personnel responsible for carrying out the corrective action
- Implementation or modification of controls necessary to avoid a repeat occurrence of the incident
- Recording of any changes in written procedures required
- Notifying all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the POEO Act.

A register of accidents, incidents and potential incidents will be maintained and will be made available for inspection at any time by the independent Hazard Auditor and DPHI.

#### EPA Notification

The EPA will also be notified of any incident that represents a threat to the environment due to a breach or breaches of EPL conditions. This will be done via the EPA's 24-hour Pollution Line (131 555) and a written notice will follow within 7 days.

#### Incident Review

A review of the incident register will be undertaken on an annual basis.

#### 5.10.2 Pollution Incident Response Management Plan

[Drafting note: As required under EPLXXXXX, a Pollution Incident Response Management Plan (PIRMP) has been developed.]

The PIRMP will be prepared and tested in accordance with *Environmental guidelines: Preparation of pollution incident response management plans* (EPA, 2012). The primary objective of the PIRMP is to minimise and control the risk of a pollution incidents at the WTF, to allow comprehensive and timely communication about a pollution incident to staff at the premises, the EPA, other relevant government agencies and community members who may be affected by the impacts of the pollution incident.

The PIRMP outlines the followings:

- Description and likelihood of hazards
- PIRMP Test Register
- Communicating with neighbours and the community
- Minimising harm to persons on the premises
- Actions to be taken during or immediately after a pollution incident.

#### 5.11 Emergency Response

In the event of an emergency, the safety of people shall always be the **FIRST PRIORITY**. If there is an emergency, the procedures and instructions contained in the Emergency Plan will be adhered to. Appendix B summarises the procedures to follow in the event of an emergency.

HiQ will ensure that the following equipment will be available to all site personnel to utilise in the event of an incident:

- Protective gloves for certain types of corrosive chemicals
- Other personal protective equipment required for the handling of hazardous chemicals



- Spill kits
- Stormwater drain guards
- Alarms for when there are issues with processes
- Firefighting equipment
- Up-to-date safety data sheets for any chemicals or fuels used or stored at the premises
- Hard hats for designated 'emergency controllers'
- Eye-wash stations.

**5.11.1 Emergency Contacts**

Emergency contact details for the Facility are presented in Table 5-6.

*Table 5-6: Emergency Contact Details*

Services / Contact Name	Contact Name	Contact No.
<b>Emergency</b>		
Ambulance – Fire – Police	N/A	000
NSW Poisons Information	N/A	13 11 26
<b>Local Services</b>		
Liverpool Hospital	N/A	02 8738 3000
<b>Other Agencies</b>		
NSW Environmental Protection Authority	N/A	02 9995 5000
Safe Work NSW	N/A	13 10 50
<b>HiQ Group</b>		
General Manager	Daniel Blair	0407 603 212
Site Manager	TBC	
Environmental/Technical Manager	TBC	

**5.12 Non-Compliances and Corrective Actions**

A non-compliance is an occurrence, set of circumstances or development that is a *breach* of any Condition of Approval, REMM, licence condition (where applicable), permit or any other statutory approval relevant to the activity and/or area where the activity occurs, and which triggers a specific statutory requirement to notify a regulatory authority. This will also include any material non-compliance against the OEMP and other plans strategies and monitoring programs required by the Conditions of Approval.

The Environmental Manager (or delegate) will monitor non-compliances against the Condition of Approval and the OEMP and will initiate a corrective and preventative action where required. Non-compliance is reported using the Non- Conformance Report in HiQ's Management System (RAPID).



Non-compliances will be reported to the Site Manager within 24 hours of the non-compliance being detected. Details of the remedial action will be reported within one working day of completion of the remedial action. The Safety, Health and Environment electronic online Incident Report in the Hi Quality Management System (ref: RAPID) will be used to document the investigation and implementation of preventative actions.

Minor non-compliances, which can be remedied immediately, will be recorded together with the appropriate remedial action in the weekly environmental checklist. A copy of the checklist will be issued monthly to the General Manager.

In the event of a non-compliance presenting potential or actual harm to the environment, the non-conforming practice must cease immediately, the Site Manager must be promptly notified, and remedial and corrective actions implemented to prevent reoccurrence.

#### 5.12.1 DPHI Non-compliance Notification

In accordance with NSW Condition XX, the Secretary must be notified in writing via the Major Projects website within seven days after HiQ becomes aware of any non-compliance. [Drafting note: To be amended once conditions are received]

Corrective actions will be:

- Specific to the incident that has occurred
- Address the root cause(s) of the incident
- Designed to prevent incident reoccurrence.

Corrective actions could include (but are not limited to) the following:

- Physical works to install or rectify controls or a site issue
- Testing and/or monitoring
- Review and improvement of construction methods or work practices
- Review and update of management plans, procedures or other tools
- Communication, training and awareness initiatives for workers.

Workers will be notified of correct systems / procedures (e.g. via toolbox talk). Site personnel will be made aware of the changes and trained as necessary.

**Condition CXX states that a non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.**



## 6 REVIEW AND IMPROVEMENT

### 6.1 OEMP Annual Review

The OEMP will be reviewed annually as a minimum to ensure the ongoing suitability, adequacy and effectiveness of the OEMP and where necessary, to reflect changes introduced by the HIQ Group operational team, site specific outcomes, non-compliances and recommendations arising out of inspections, meetings and audits, including:

- Communications and complaints from interested parties
- Status of implementation of corrective and preventative actions
- Action items from previous management reviews
- Changing circumstances including developments in legislative and other requirements related to operations at the Facility
- Change in inspections and/or monitoring frequency requirements
- Recommendations for improvements.

Outputs from management reviews will include decisions and actions related to possible changes to the OEMP which can result in (and is consistent with) continual improvement.

### 6.2 Contingency Planning

If an exceedance of an environmental criterion is considered to have occurred, the following Contingency Plan will be implemented:

- The Environmental Manager will review the incident to determine the cause of the incident, immediate actions required to manage the incident and the potential improvement plan that may be applied
- The observation will be reported to the Environmental Manager and Group General Manager within 24 hours
- The observation will be recorded by the Environmental Manager
- The Environmental Manager will report the incident to the DPHI and EPA, if required under the requirements conditions of approval
- HIQ will apply adaptive management to support any improvement plans formulated
- Depending on the nature and severity of the exceedance and any potential impacts to the environment and local residences, HIQ may temporarily suspend its operations (or part thereof) which are deemed to be contributing to the exceedance pending an internal investigation
- HIQ will assess the exceedances, modify its operations and implement safety measures in accordance with the relevant Management Plan/s; The Environmental Manager will investigate any potential contributing factors and identify an appropriate action plan to manage the identified impact(s), in consultation with specialists and/or relevant agencies, if necessary
- HIQ will identify the appropriate course of action with respect to the identified impact(s), in consultation with any required technical specialists, any relevant agencies, as necessary
- HIQ will implement the appropriate course of action to the satisfaction of all stakeholders
- HIQ will continue to monitor performance with the new action plan in place and, if successful will formalise these actions as part of the Management Plan.



Contingency measures will be developed in consideration of the specific circumstances of the issue and the assessment of consequences. Modification or suspension of operations would include such actions ranging from increasing the frequency or route of the water cart to reduce dust in particular problem areas, to temporarily ceasing operations or part thereof. This would be dependent on the nature, severity and potential impact on residences and the environment of the exceedance or potential exceedance.

### 6.3 Adaptive Management

HiQ will assess and manage risks to comply with the criteria and/or performance measures outlined within the conditions of approval. Where any exceedance of these criteria and/or performance measures occurs, at the earliest opportunity, HiQ will:

- Take all reasonable and feasible measures to ensure that the exceedance ceases and does not recur
- Consider all reasonable and feasible options for remediation
- Implement remediation measures.

DRAFT



## APPENDIX A Environmental Observations And Actions Checklist

Site:	
Inspected By:	
Date:	

<b>Legend – Record in Results Column</b>	S Column - ✓ = Standard meet	A Column - X = action required	N/A Column = Not applicable
--	------------------------------	--------------------------------	-----------------------------

Inductions	S	A	N/A	COMMENTS
All site personnel inducted				
All contractors inducted and supplied insurances/WMS				
Toolbox meetings conducted				
Building & Structures	S	A	N/A	COMMENTS
Floors in good condition				
Lighting Adequate				
Ventilation - Air Flow				
Amenities - clean and hygienic				
Emergency – Exits Identified and sign posted in office/weighbridge				
Mechanical Safeguarding	S	A	N/A	COMMENTS
Machine guarding – complies with appropriate standards				
Lock-out System and Usage Tags/locks available				
Switches, Isolators, Valves & Controls – Labelled				
Ladders, Handrails and Walkways comply with standards				
Lifting Gear and Machinery Identified and on register				
Regular inspections				
Conveyor - Gears, pulley, shaft and nip points guarded				
Emergency stop				
Lanyards on all conveyors				
Fire Safety	S	A	N/A	COMMENTS
Access to fire equipment				
Access to exits				
Extinguishers/reels inspected and in test date				



# PRESTONS WASTE TREATMENT FACILITY

## OPERATION ENVIRONMENTAL MANAGEMENT PLAN

Integrated Management System

ENV-M-20

Appropriate fire equipment				
Signage				
Training of personnel				
<b>Electrical Safety</b>	<b>S</b>	<b>A</b>	<b>N/A</b>	<b>COMMENTS</b>
Switchboards secured				
Switchboards signage				
Test and tagging in date				
Power points and plugs				
Danger tag and lock out system in place				
RCD units tested				
<b>Equipment Safety</b>	<b>S</b>	<b>A</b>	<b>N/A</b>	<b>COMMENTS</b>
Guards and e-stops				
Storage of tools/equipment				
Pressure vessels in test				
Oxy acetylene cylinders				
Welders VCRs installed				
Compressors in test				
Equipment signage/labelling				
<b>Emergency Provisions</b>	<b>S</b>	<b>A</b>	<b>N/A</b>	<b>COMMENTS</b>
First aid kits				
Qualified first aid person on site				
Emergency eye wash				
Emergency contacts available and displayed				
Relevant signage in place				
Personnel trained				
Incident/accident report forms available and used				
Hazard report forms available and used				
<b>Hazardous Substances</b>	<b>S</b>	<b>A</b>	<b>N/A</b>	<b>COMMENTS</b>
Register available and used				
Products labelled correctly				
Safety Data Sheets- available & in date (Valid for 5 years)				
Stored appropriately, banded & containment				
Segregation distances				
<b>Gas Cylinders and Pressure Vessels</b>	<b>S</b>	<b>A</b>	<b>N/A</b>	<b>COMMENTS</b>
Pressure Vessels – register available				
Inspections/tests to standard and labelled				



# PRESTONS WASTE TREATMENT FACILITY

## OPERATION ENVIRONMENTAL MANAGEMENT PLAN

Integrated Management System

ENV-M-20

Relief (safety) valve operational				
Drained & free of moisture				
Gas Cylinders - Cylinders correctly stored				
Segregation distance				
Correct flashback arrestors used				
<b>Mobile Plant &amp; Machines</b>	<b>S</b>	<b>A</b>	<b>N/A</b>	<b>COMMENTS</b>
Daily Pre-Start completed				
Operator competent				
Seat belts				
ROP's, FOP's, TOP's in place				
Overhead guards where applicable				
Fire Extinguishers				
Flashing light/reversing alarm				
Maintenance records				
Isolated when unattended				
Cranes/Hoists				
<b>Storage</b>	<b>S</b>	<b>A</b>	<b>N/A</b>	<b>COMMENTS</b>
Clean storage areas				
Relevant signage				
Organisation				
Storage shelves				
Dangerous goods				
Storage – adequate				
<b>General</b>	<b>S</b>	<b>A</b>	<b>N/A</b>	<b>COMMENTS</b>
Work areas clean				
Adequate lighting				
Waste bins				
Ventilation				
Ground conditions				
Signage				
<b>Toilets</b>	<b>S</b>	<b>A</b>	<b>N/A</b>	<b>COMMENTS</b>
Walls, floors, doors, windows				
Toilet bowls and seats				
Urinal				
Toilet rolls & dispensers				
Soap				



# PRESTONS WASTE TREATMENT FACILITY OPERATION ENVIRONMENTAL MANAGEMENT PLAN

Integrated Management System

**ENV-M-20**

Lunchroom	S	A	N/A	COMMENTS
Sink				
Benches/Tables				
Cleaning equipment				
Bins lids available				
Fridge clean				
Cooking equipment				
Lights switches and sockets				
Ventilation				
Fire equipment				
Access Road	S	A	N/A	COMMENTS
Wide enough for vehicles				
Adequate passing areas				
Graded surface, no spillage, potholes (Camber 2-3%)				
Signage -Access to site adequately sign posted -Speed limits				
Roads Ramps Dumps	S	A	N/A	COMMENTS
Go Line				
Graded and free of obstructions				
Vehicles parked at safe distance apart				
Windrows Axle height of the largest wheeled vehicle				
Sufficiently wide enough to stop vehicle				
Delineators clearly visible and reflectors clean				
Surface - Adequate width, passing area				
Well graded and free of spillage and potholes				
No signs of cracking or collapse of edges				
Dust suppression				
Traffic movement in accordance to procedures				
Camber 2-3% Less than 10:1 gradient				
Open Pit	S	A	N/A	COMMENTS
Walls designed angle				
No Cracks or over hangs				
No loose material				
Access ramp away from working face				
Berms adequate within ratio to wall height				
Drainage away from pit surrounds				
Environmental	S	A	N/A	COMMENTS





**PRESTONS WASTE TREATMENT FACILITY**  
**OPERATION ENVIRONMENTAL MANAGEMENT PLAN**  
 Integrated Management System

**ENV-M-20**

Sign Off			
Person undertaking inspection			
Print Name	Signature		
Findings/actions arising from this report have submitted to:	Print Name	Position Title	Signature

DRAFT



## APPENDIX B INCIDENT AND EMERGENCY RESPONSE PLAN

### Emergency Preparedness and Response

In the event of an emergency, the safety of people shall always be the FIRST PRIORITY. In the event of an emergency, the procedures and instructions contained in the Emergency Plan will be adhered to.

Steps to be followed include:

- Check personnel safety and attend to any injured personnel so far as is required to prevent further injury, provided no other person is put at risk in the process
- All personnel on site shall be alerted to emergencies by verbal command and directed to an assigned muster or assembly point
- Once emergency services have been notified, site personnel shall, at the earliest opportunity, contact the relevant other parties to report the incident and determine the appropriate course of action.

### Environmental Incidents

Pollution and environmental damage can arise from emergency incidents such as:

- Spillages of dangerous goods, chemicals, fuel and oils
- Unlicensed discharge of pollutants to environment (air, water, noise, soil)
- Structural collapse
- Traffic accidents
- Vandalism, arson and theft
- Explosions and natural disasters – e.g. flood and fire.

All environmental incidents will be dealt with promptly to reduce any potential impacts.

The incident Response Process will be in accordance with the PIRMP.

The NSW EPA and relevant emergency services (as required) will be notified immediately after the person becomes aware of the incident (and is safe to do so), a written report of the notification will be submitted within seven days of the incident occurring.

### Spills Response

Spills at the Facility are most likely to involve fuel, hydraulic oil, engine oil spilled from plant items, though potentially paint and solvents may also be present.

If a chemical or reagent spill occurs, HiQ's Hazardous Chemical Emergency Management Plan (SAF-M-13) will be followed:

- All work to cease in the affected area
- Check personnel safety
- Immediately identify the spilled material and notify the Site Manager. A Register and Safety Data Sheet (SDS) is kept for all hazardous substances kept at the workplace. Spill Kits are kept near chemical storage areas, bunded and refuelling areas, high trafficked areas, etc; and
- Any incidents on site which are likely to cause material harm to the environment are to be immediately reported to the Site Manager.

Any liquid waste spillages would be recirculated through the Liquid Waste Treatment Plant.



## Fire Event

In the event of a fire, the following procedure will be followed:

- Alert persons nearby and request for help
- Raise the alarm
- Summon the Site Manager
- Fight the fire only if it is safe to do so
- Evacuate if necessary – using the nearest safe exit
- Assemble at the relevant muster point in your area
- Await further instructions.

## Flood Event

In the event of a flood, the following procedure will be followed:

- Establish access to up to date and credible information
- Alert and connect with staff
- Conduct an incident assessment and assess the potential for impact to the facility
- Evacuate if necessary – using the nearest safe exit
- Assemble at the relevant muster point in your area
- Await further instructions.

Prior to an extreme flood event all waste material classified as 'Hazardous' waste would be removed from the Facility.

## Evacuation

If an evacuation alarm sounds and/or there is an announcement on the site wide UHF radio, evacuate the area immediately:

- Follow the instructions given and walk calmly to the nearest assembly area relevant to your work area – refer to the Emergency Management Diagrams located on site
- Do not leave the assembly area unless requested to do so; and
- A first aid station will be set up at each assembly area to anyone requiring treatment.



---

## APPENDIX C      Unexpected Finds Management Plan

[To be prepared following project approval]

DRAFT



---

APPENDIX D      OPERATIONAL TRAFFIC MANAGEMENT PLAN

DRAFT



---

APPENDIX E      OPERATIONAL AIR QUALITY MANAGEMENT PLAN

DRAFT



---

APPENDIX F      OPERATIONAL WASTE MANAGEMENT PLAN

DRAFT



---

**APPENDIX G      CONDITIONS OF CONSENT AND REMMS APPLICABLE  
TO OPERATION**

DRAFT



**PRESTONS WASTE TREATMENT FACILITY  
OPERATION ENVIRONMENTAL MANAGEMENT PLAN**  
Integrated Management System

ENV-M-20

Conditions of Consent applicable to Operations

Condition #	Requirement	Where addressed	Responsibility	Reference
TBC	The Applicant must prepare an Operation Environmental Management Plan (OEMP) to the satisfaction of the secretary. The OEMP must:	This Plan		

DRAFT



**PRESTONS WASTE TREATMENT FACILITY  
OPERATION ENVIRONMENTAL MANAGEMENT PLAN**  
Integrated Management System

ENV-M-20

REMMS applicable to operations

ID	Mitigation Measure	Timing	Responsibility	Reference Document
General				
G2	<p>An Operational Environmental Management Plan (OEMP) will be prepared and implemented to guide environmental management and monitoring activities during operation as identified within the EIS in addition to further specific issues identified within the Table. Also refer to Section 16.2 of the EIS. Sub-plans to be prepared as part of the OEMP will include:</p> <ul style="list-style-type: none"> <li>Operational Waste Management Plan</li> <li>Operational Traffic Management Plan</li> <li>Operational Noise and Vibration Management Plan</li> <li>Operational Air Quality Management Plan</li> <li>Stormwater and Leachate Management Plan</li> <li>Emergency Response Plan</li> </ul> <p>The OEMP will be reviewed annually or more frequently on an as needed basis should there be a change in risk, legislative requirements, or non-compliance.</p>	Operation	Site Manager	This OEM and its sub plans
Stakeholder Consultation				
SC1	The Stakeholder Engagement Strategy will be updated to provide procedures for communication with stakeholders, procedures for the dissemination of information to the community, identification of the communication channels available for the community and stakeholders to provide feedback on the Project, a protocol for the Project to respond to any enquires or feedback and for managing site visits and property inspections during both construction and operation.	Construction/Operation	Site Manager	Stakeholder Engagement Strategy
Materials and Waste				
MW1	<p>The Operational Waste Management Plan will include specific details on waste management practices on site, including:</p> <ul style="list-style-type: none"> <li>Stockpile handling and management</li> <li>Details of soil and sludge handling procedures (e.g. details on how often bioremediated soils will be mixed)</li> </ul>	Operation	Site Manager	OWMP



**PRESTONS WASTE TREATMENT FACILITY**  
**OPERATION ENVIRONMENTAL MANAGEMENT PLAN**  
 Integrated Management System

ENV-M-20

ID	Mitigation Measure	Timing	Responsibility	Reference Document
	Sampling and analysis programs for each of the waste streams, including the remediation target levels and monitoring requirements during treatment Contingency measures where materials do not respond to treatment methods Weighbridge waste acceptance procedure Non-conforming waste procedure Waste screening procedure Batch control procedure Material handling procedures – unloading and loading Maintenance procedures Verify licenses and permits for the handling, transportation, and disposal of waste Inspection, monitoring, review and auditing Site induction and training			
MW2	Waste Management will be included in the Site Induction.	Construction/operation	Site Manager	OWMP
MW3	Signs will be erected around the Site providing direction for waste management and adopting the waste management hierarchy.	Construction/operation	Site Manager	OWMP
MW4	Waste storage areas will be located within the building and as per the Liverpool City Council DCP Requirements.	Operation	Site Manager	OWMP
MW5	Operations on the Site will be planned to efficiently manage delivery and storage of materials, reduce waste and spoilage.	Operation	Site Manager	OWMP
MW6	Agreements with suppliers for 'take back' to be arranged where possible.	Operation	Site Manager	OWMP
MW7	General Waste and recycling skips will be made available and emptied regularly so as not to overflow.	Construction/operation	Site Manager	OWMP
MW8	All wastes will be managed and properly disposed of in accordance with an appropriately licensed contractor.	Construction/operation	Site Manager	OWMP
MW9	The following measures will be implemented to prevent waste spreading from the Site: Loads covered until inside the building and before leaving the building. A truck and wheel wash will be installed for trucks prior to exiting the building.	Operation	Weighbridge Operator	OWMP



# PRESTONS WASTE TREATMENT FACILITY OPERATION ENVIRONMENTAL MANAGEMENT PLAN

Integrated Management System

ENV-M-20

ID	Mitigation Measure	Timing	Responsibility	Reference Document
	Entry and exit signage to advise transport operators of covering and loading and unloading procedures. Unloading and loading of waste material will occur within the building.			
MW10	Sampling and Analysis Quality Plans (SAQPs) will be prepared for the treatment of soils and liquid waste at the Site. The SAQPs will be reviewed annually, or more frequently, on an as needed basis should there be a change in risk, legislative requirements, or non-compliance.	Operation	Site Manager	OWMP
Traffic and Transport				
TT1	A construction and operation traffic management plan would be prepared prior to construction and operation of the Project, which would be included within the CEMP and OEMP. These plans would include standard traffic management measures including hours of access, vehicle circulation and parking.	Construction/Operation	Site Manager	OTMP
Noise and Vibration				
NV1	A Noise Management Plan will be completed for construction and operation and include: <ul style="list-style-type: none"> <li>Identification of the surrounding noise-sensitive land use.</li> <li>A description of working hours and practices to minimise noise.</li> <li>A list of high noise equipment or processes along with mitigation / minimising measures where possible.</li> <li>A community complaints register and written process for handling complaints.</li> <li>A description of noise generating activities will be discussed in the morning toolbox with opportunities to minimise noise impacts identified and implemented where possible.</li> </ul>	Construction/Operation	Site Manager	ONVMP
NV2	Proposed plant and equipment will be selected and maintained to achieve the sound power levels outlined in the Noise Assessment (Appendix F of the RtS).	Operation	Site Manager	ONVMP
NV3	Plant and equipment will be maintained and not generate excessive noise.	Operation	Site Manager	ONVMP
NV4	Broadband reversing alarms will be utilised in place of traditional beeper reversing alarms.	Operation	Site Manager	ONVMP
NV5	Machinery will be operated in a manner that reduces maximum noise level events.	Operation	Site Manager	ONVMP
NV6	Site awareness training / environmental inductions will include a section on noise mitigation techniques / measures to be implemented when on the Site.	Operation	Site Manager	ONVMP



# PRESTONS WASTE TREATMENT FACILITY OPERATION ENVIRONMENTAL MANAGEMENT PLAN

Integrated Management System

ENV-M-20

ID	Mitigation Measure	Timing	Responsibility	Reference Document
Air Quality, Odour and Greenhouse Gases				
AQ2	<p>An Operational Air Quality Management (OAQMP) plan will be developed for the Proposal. The OAQMP will:</p> <ul style="list-style-type: none"> <li>• Establish procedures to routinely maintain and test operation of the Heating Ventilation and Air Conditioning (HVAC) and emissions control systems</li> <li>• Procedures for air quality monitoring</li> <li>• Minimise the fugitive emissions from the Site</li> <li>• Identify contingency measures to minimise air quality impacts in the event of failure of the HVAC and emissions control systems</li> <li>• Prevent idling of mobile plant and haul trucks when not in use</li> <li>• Material loading / unloading and handling procedures designed to reduce fugitive dust emissions, e.g. high-speed roller-doors required to be closed during material loading / unloading and handling.</li> </ul>	Operation	Site Manager	OAQMP
AQ3	Emissions control devices will be operated according to their manufacture's specifications.	Operation	Site Manager	OAQMP
AQ4	Regular preventative maintenance of emissions control devices according to their manufacture's specifications will be carried out.	Operation	Site Manager	OAQMP
AQ5	A truck and wheel wash station at the Waste Treatment Facility exit will be installed to reduce soil track-out and generation of fugitive dust outside the building envelope.	Operation	Site Manager	OAQMP
AQ6	The need for fogging suppression systems, where deemed necessary, will be determined during detailed design. This potentially includes Compartment 3 Treatment Bays and other areas as needed.	Operation	Site Manager	OAQMP
AQ7	Compartment 3 on/off switches will be used to focus air collections in the active 1 of 5 Treatment Bays being used for stockpile bay hood to collect, and send for treatment, approximately 95% of the total air flow through the space.	Operation	Site Manager	OAQMP
AQ8	Fabric side curtains and front drop curtain to 4 m will be installed on the Bioremediation Bays and will be used to contain minor contaminant generation from handling and turning process.	Operation	Site Manager	OAQMP



# PRESTONS WASTE TREATMENT FACILITY OPERATION ENVIRONMENTAL MANAGEMENT PLAN

Integrated Management System

ENV-M-20

ID	Mitigation Measure	Timing	Responsibility	Reference Document
AQ9	The building compartments will be maintained at > -5 Pascals (Pa) while in 'daily treatment mode'. When in 'after hours mode', the building can exhaust air system from each compartment shall be reduced and associated outside air inlet dampers closed off to maintain > -5 Pa whilst saving energy.	Operation	Site Manager	OAQMP
AQ10	To validate the model predictions from the AAQIA (Appendix E of the Rts), it is proposed that post-commissioning stack testing be undertaken during the first year of operation of each Stage. This post-commissioning testing will include: <ul style="list-style-type: none"> <li>Stack testing upstream and downstream of the air emissions control system to validate the manufactures-stated Particulate Matter (PM) and Volatile Organic Compounds (VOC) removal efficiencies.</li> <li>Stack testing for size resolved PM (PM2.5 and PM10) and a metals in PM assay while treating bulk soils or wastes containing heavy metals.</li> <li>Stack testing for VOCs or odour while treating wastes containing hydrocarbons, industrial solvents and/or odorous wastes.</li> </ul> If post-commissioning stack testing indicates the model predictions are conservative, then stack testing will be repeated on a once-in-three years basis.	Operation	Site Manager	OAQMP
AQ11	If post-commissioning testing indicates that there is the potential for air impacts, then fenceline or local air quality monitoring is proposed to be undertaken. This air quality monitoring could include, but may not be limited to, the following: <ul style="list-style-type: none"> <li>Size resolved fenceline particulate matter monitoring (PM2.5 and PM10)</li> <li>Dust deposition gauge monitoring;</li> <li>Hydrocarbon or VOC monitoring or;</li> <li>Total reduced sulphur compound or odour monitoring.</li> </ul>	Operation	Site Manager	OAQMP
AQ12	Energy consumption associated with the generation of greenhouse gas emissions for the Project will be limited by the following mitigation measures: <ul style="list-style-type: none"> <li>Use of fuel-efficient machinery, equipment, and plant</li> <li>Consider energy rating when purchasing new machinery and equipment</li> <li>Implementing a maintenance plan for fuel and electricity powered machinery and equipment</li> <li>Training to and implementing energy conservation practices by all staff</li> </ul>	Operation	Site Manager	OAQMP



**PRESTONS WASTE TREATMENT FACILITY  
OPERATION ENVIRONMENTAL MANAGEMENT PLAN**  
Integrated Management System

**ENV-M-20**

ID	Mitigation Measure	Timing	Responsibility	Reference Document
	<ul style="list-style-type: none"> <li>Consider use of solar energy where feasible.</li> </ul>			
Soil and Water				
SW2	<p>The OEMP will outline environmental procedures during operation including development and implementation of an Stormwater and Leachate Management Plan that will include the following measures:</p> <ul style="list-style-type: none"> <li>Implementation of the proposed post-development stormwater management strategy and plan</li> <li>Recycle and reuse the rainwater for the Site’s activities to reduce the portable water use</li> <li>Allow no process water mix into the Site’s stormwater system through:               <ul style="list-style-type: none"> <li>All storage and handling of materials undertaken inside the Waste Treatment Facility</li> <li>Bunding the doorways of the Waste Treatment Facility with drive over bunding</li> <li>Undertake wheel and truck wash down inside the build prior to exit with water collected and directed to the liquid waste treatment plants</li> <li>Leachate collection within the Waste Treatment Facility</li> <li>Overflow protection on all tanks</li> <li>Bunding of the liquid waste treatment plants in accordance with Australian Standards</li> <li>Storage of reagents classed as dangerous goods above the PMF in accordance with relevant Australian Standards</li> <li>No delivery truck wash down inside the Waste Treatment Facility</li> <li>Material Safety data sheets maintained onsite for all chemicals</li> <li>Bunds water-proof tested on a regular basis and repair implement as needed and procedures documented in the OEMP</li> <li>Appropriately lined Pre-Treatment Pits and regularly inspected and epoxy liner and concrete repairs implement as needed and procedures documented on the OEMP</li> <li>Spill kits located adjacent to potentially contaminating activities and procedures would be in place for Spill Management and documented in the OEMP.</li> </ul> </li> <li>Installation of water efficient fixtures to conform to Council requirements.</li> <li>No use of groundwater by the Project.</li> <li>Quarterly monitoring of the groundwater and surface water quality.</li> </ul>	Operation	Site Manager	Stormwater and Leachate Management Plan



# PRESTONS WASTE TREATMENT FACILITY OPERATION ENVIRONMENTAL MANAGEMENT PLAN

Integrated Management System

ENV-M-20

ID	Mitigation Measure	Timing	Responsibility	Reference Document
SW3	The minimum finished floor level for the Project be 23.6 m AHD (Australian Height Datum), which is identified by Council as the maximum 1% AEP (Annual Exceedance Probability) flood level at the Site of 23.1 m AHD plus 0.5 freeboard allowance. Any onsite parking will be located above the 1% AEP flood level of 23.1m AHD.	Operation	Site Manager	Stormwater and Leachate Management Plan
Hazards and Risk				
HR1	A Pollution Incident Response Management Plan (PIRMP) will outline procedures to minimise the risk of a pollution incident on the premises and notification, action, and communication procedures to ensure the incident is dealt with safely, and all relevant people and authorities are notified, and kept informed throughout the incident. The PIRMP will be reviewed annually or more frequently on an as needed basis should there be a change in risk, legislative requirements, or non-compliance.	Construction/operation	Site Manager	PRIMP
HR2	The storage and handling of dangerous goods would be as per the EPL for the Site and be bunded and stored in accordance with the relevant Australian Standards including: <ul style="list-style-type: none"> <li>Corrosive substances (Class 8) to be stored and handled by following the methods outlined in AS 3780-2008, The storage and handling of corrosive substances.</li> <li>Storage and handling of Class 5.1 oxidizing substances to be undertaken in accordance with AS 4326-2008, The storage and handling of oxidizing agents.</li> </ul>	Operation	Site Manager	PRIMP
Human Health				
HH1	Quarterly personal and ambient monitoring will be conducted to verify that engineering controls outlined above are effective in controlling worker exposure to contaminants.	Operation	Site Manager	This plan
HH2	Dermal contact and ingestion will be managed through standard personal hygiene practices, personal protective equipment, clothes change policy and the use of containerised plant, mobile plant and enclosed systems to minimise physical contact with the waste streams.	Operation	Site Manager	This plan
HH3	Emergency showers and eyewash stations will be installed and maintained in accordance with AS4775 Emergency eyewash and shower equipment.	Operation	Site Manager	This plan
HH4	A structured, pre-employment medical and risk-based health surveillance program will be implemented for the Project.	Operation	Site Manager	This plan



**PRESTONS WASTE TREATMENT FACILITY  
OPERATION ENVIRONMENTAL MANAGEMENT PLAN**  
Integrated Management System

ENV-M-20

ID	Mitigation Measure	Timing	Responsibility	Reference Document
HH5	During the first year of operation a competent, independent occupational hygienist will design and conduct quarterly personal and ambient monitoring for silica dust, dust and vapours. The program will be reviewed at the end of the first year and adjusted based on the outcome of the results and Site observations.	Operation	Site Manager	This plan
HH6	All employees will be required to complete the Proponent's onboarding and induction system that includes health and safety training. The induction will be Site-specific and developed as part of the OEMP for the Project, including the key hazards within each area of the Waste Treatment Facility and critical controls. This induction will include the following key related elements: <ul style="list-style-type: none"> <li>• Dangerous goods (storage, handling and use)</li> <li>• Contaminants (e.g. asbestos, PAHs, dust, vapours)</li> <li>• Use and maintenance of personal protective equipment</li> <li>• Personal hygiene and clothes change policy</li> <li>• Incidents and first response</li> <li>• Personal decontamination (safety showers)</li> <li>• Spill response</li> <li>• Site critical controls</li> <li>• Workplace monitoring</li> </ul>	Operation	Site Manager	This plan
HH7	Signage will be provided within the Waste Treatment Facility that identifies process areas, key hazards and protective equipment requirements.	Operation	Site Manager	This plan
HH8	Task based training will be provided and include a competency assessment process with personnel not being permitted to work unsupervised until deemed competent.	Operation	Site Manager	This plan
HH9	Ongoing education and awareness will be provided through the health & safety alerts and toolbox meetings.	Operation	Site Manager	This plan
HH10	The Proponent will maintain their health and safety management system developed to align with AS/NZS ISO 45001:2018 Occupational Health and Safety Management Systems – Requirements with Guidance for use.	Operation	Site Manager	This plan



# PRESTONS WASTE TREATMENT FACILITY OPERATION ENVIRONMENTAL MANAGEMENT PLAN

Integrated Management System

ENV-M-20

ID	Mitigation Measure	Timing	Responsibility	Reference Document
Fire and Incident Management				
FIM1	All aspects of the Fire Safety Strategy as identified within Appendix K (of the EIS) will be adopted and proposed fire safety measures will meet the relevant Performance Requirements of the National Construction Code (NCC).	Operation	Site Manager	Fire Safety Strategy
FIM2	The Project will be consistent with Fire and Rescue NSW Guidelines including: <ul style="list-style-type: none"> <li>• Access for firefighters and emergency vehicles.</li> <li>• Building design.</li> <li>• Sprinkler and Fire Hydrant System design (including appropriate water pressure).</li> <li>• Fire detection and alarm system.</li> <li>• Smoke Hazard Management.</li> <li>• Fire Water Run-Off Containment.</li> <li>• Stockpile location and size.</li> </ul>	Operation	Site Manager	Fire Safety Strategy
FIM3	An Emergency Response Plan will be developed in accordance with Hazardous Industry Planning Advisory Paper No 1: Emergency Planning (DPIE, 2011), and all staff will receive training in emergency procedures including the Emergency Response Procedures and delegated fire wardens, the evacuation routes, and the procedures to follow in a fire event. Flood emergency management will be incorporated into the plan with a shelter-in-place strategy adopted for the Site during any flood events. This will be documented within an Emergency Response Plan (ERP) as part of the OEMP for the Project and be in accordance with Work Health and Safety (WHS) legislation and AS3745:2010.	Operation	Site Manager	Appendix B of this Plan
FIM4	Portable fire extinguishers will be provided throughout the building in accordance with the NCC and selected, located, and distributed in accordance with AS2444:2001.	Operation	Site Manager	Fire Safety Strategy
FIM5	A dedicated smoke exhaust system in Fire Compartment 1 and 3 will be implemented to comply with the requirements of Clause 3 of Specification E2.2b of the NCC with a minimum operating duration of at least 2 hours. The exact smoke exhaust rates shall be determined through detailed design.	Operation	Site Manager	Fire Safety Strategy
FIM6	Primary firewater containment will be from process bunding pits and main floorplate within the Waste Treatment Facility building. This shall be achieved by bunding entry points with drive-over bunding at the truck entry and exits. This primary containment must be capable of containing:	Operation	Site Manager	Fire Safety Strategy



# PRESTONS WASTE TREATMENT FACILITY OPERATION ENVIRONMENTAL MANAGEMENT PLAN

Integrated Management System

ENV-M-20

ID	Mitigation Measure	Timing	Responsibility	Reference Document
	<ul style="list-style-type: none"> <li>Hydrants operating at 30 L/s for a minimum of 4 hours and</li> <li>High hazard sprinklers operating for a minimum of 2 hours – flowrate to be advised by fire services engineer and</li> <li>Drenchers operating for a minimum of 2 hours – flowrate to be advised by fire services engineer.</li> </ul>			
FIM7	Stockpiles will not exceed 4 m in height. Fire separating masonry walls shall extend at least 1 m above the top of a stockpile and at least 2 m beyond the outermost stockpile edge. The boundary limits of stockpiles will be permanently marked. It is noted for fire purposes these requirements shall only apply to each 100 m <sup>3</sup> stockpile. Internal partitioning proposed for operational purposes need not comply with these requirements.	Operation	Site Manager	Fire Safety Strategy
FIM8	Each accessible side of a stockpile will have at least 6 m of clear unobstructed space to reduce the risk of fire spread.	Operation	Site Manager	Fire Safety Strategy
FIM9	Internal stockpiles will not impede access to exits and a minimum 1 m path must be maintained past stockpiles to ensure requires paths of travel are accessible.	Operation	Site Manager	Fire Safety Strategy
FIM10	The fire safety systems will be tested and maintained in accordance with Australian Standard AS1851 or other relevant testing regime.	Operation	Site Manager	Fire Safety Strategy
FIM11	The ERP and Operational Waste Management Plan will be developed by the Site operator as per Section 8.6 of FRNSWs Guideline – Fire Safety in Waste Facilities.	Operation	Site Manager	Fire Safety Strategy
FIM12	An Emergency Services Information Package will be provided to emergency service personnel in accordance with Section 9.4.2 of FRNSWs Guideline – Fire Safety in Waste Facilities.	Operation	Site Manager	Fire Safety Strategy
Other: Heritage				
H1	In the unlikely event that Aboriginal or suspected Aboriginal archaeological material is uncovered during the development, then works in that area are to stop and the area cordoned off. The project manager will contact DPHI or other regulatory body to make an assessment as to whether the material as classed as Aboriginal object/s under the <i>National Parks and Wildlife Act 1974</i> and advise on the required management and mitigation measures. Works are not re-commenced in the cordoned area until heritage clearance has been given and/or the required management and mitigation measures have been implemented.	Construction/Operation	Site Manager	Fire Safety Strategy



---

APPENDIX H      OPERATIONAL RISK REGISTER

DRAFT

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	Unmanaged (UM)						Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	Managed Risk						Control Option/Action	Action Owner	Comments
							Safety			Environment					Safety			Environment					
							L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)			L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)			
1	[Carpark / External] Waste Reveal and Offtake	On-Land Transport (Driving)	Loss of control of waste trucks	A large number of environmental consequences to consider given the variety of waste loads  Drill muds - uncontaminated Sol: ASS, PFAS, TPH, TRH, BTEXN, coal tar, CCA, BaP, Phenol, AC, heavy metals (Pb, Cr, Cu, As, Ni, Cd, Hg, Se, Ag) Sludge - all soil contaminants? PFAS Soil Liquid waste: TPH, PAH, heavy metals, organics PFAS Liquid waste Packaged waste (unknown contaminants?)	Waste truck driver error  Poor markings, speeding, new driver, evening operations  Driver medical condition  Driver unfamiliar with site	<b>Safety</b> Harm to personnel (by impact)  Damage to nearby parked vehicles in carpark (Escalated: Fire or Explosion, Injury / Fatality)  <b>Environment</b> Spillage of liquid waste product, unwanted reactions, leak of waste material beyond site boundary (Whyalla Place). Pollution of waterways / mixing with stormwater system / groundwater  Spillage of solid waste leading to release of contaminant particulates, vapours, dust, and odours	Possible	Severe	Medium	Unlikely	Major	Medium	Separation between heavy and light vehicle sectors  Truck scheduling / access known  Loads are uniform and known  Trucks covered until they enter facility (OEMP)  Driver training / protocol  Speed limits (5 km) and traffic control, signage	Emergency response plan (spills, fire) (OEMP)  OTMP - responsibility of directors to manage incoming deliveries  Weighbridge is banded	Rare	Severe	Low	Rare	Severe	Low			In discussion Hi-Quality noted that the responsibility for this incident would also fall to the transport provider
2	[Carpark / External] Waste Reveal and Offtake	General	Leak of waste material from waste truck	Already a leak present when truck arrives at facility	Improper securing of waste containers during transport  Improper closing of truck storage  Wheel generated dust movements	<b>Safety</b> Harm to personnel (skin contact, inhalation) (Specifically liquid waste and drill muds)  <b>Environment</b> Spillage of liquid waste product, unwanted reactions, leak of waste material beyond site boundary (Whyalla Place). Pollution of waterways / mixing with stormwater system / groundwater  Spillage of solid waste leading to release of contaminant particulates, vapours, dust and odours	Possible	Minor	Medium	Possible	Minor	Medium	Quality control of operators / transporters (blacklisting - also a requirement for overloading)	Spill kits - OEMP emergency response (employee induction on procedure)  PPE on personnel	Unlikely	Minor	Low	Unlikely	Minor	Low	Add notification to generator of vehicles in an unmaintained state to the OEMP (Acceptance protocol)	Arcadis on behalf of Hi-Quality	Incident has occurred twice during operation at Yatala.
3	[Carpark / External] Waste Reveal and Offtake	Incompatible Mixing	Receival of unacceptable waste types / incompatible material	Dangerous goods except for Liquid wastes Class 8 Packing II & III Any form of Asbestos PFAS materials (apart from PFAS contaminated soil for storage - to be reviewed from EPA EIS Response)  Flammable and pH are the important factors to consider	Inadvertant waste mixing (undetected contaminant)  Improper cataloging of waste  Incorrect classification of waste type  Mixing of waste batches	<b>Safety</b> Cross-contamination, unwanted reactions  Harm to personnel  <b>Environment</b> Release of dangerous goods waste materials	Possible	Minor	Medium	Possible	Slight	Low	Generator screening / acceptance protocol  OEMP / OWMP unexpected finds protocol	Rejected loads protocol for onsite receipt  PPE for personnel	Rare	Minor	Low	Rare	Slight	Low	Confirm inclusion of rejected loads register as a part of non-conforming waste protocol	Arcadis on behalf of Hi-Quality	

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
4	[Carpark / External] Waste Receive and Offtake	On-Land Transport (Driving)	Waste trucks on hold	Hold up within facility meaning trucks need to wait outside site with waste loads	Incorrect delivery schedule Traffic delays Facility mismanagement	<b>Safety</b> Potential traffic obstruction and accident risk <b>Environment</b> Release of dust and odours of exposed solid waste	Unlikely	Slight	Low	Unlikely	Slight	Low	7 stacking spaces in facility, turning circles OTMP and scheduling of deliveries OWMP outlining stoppage protocols Inspection of vehicles during arrival	Loads are covered - acceptance protocol / legislation Industrial area (no large pedestrian numbers / through traffic)	Rare	Slight	Low	Rare	Slight	Low	Review number of vehicles stacked on site within Compartment 1 (Existing Warehouse)	Arcadis on behalf of Hi-Quality	All vehicles accepted to be covered according to acceptance protocol.
5	[Carpark / External] Waste Receive and Offtake	Open Flame	Fire / Ignition	Vehicle fires	Ignition source from waste truck (fuel leak, hot surfaces e.g., breaks) Hot loads	<b>Safety</b> Harm to personnel (Escalated: Explosion) <b>Environment</b> Release of vapours / gases / odours	Unlikely	Major	Medium	Unlikely	Severe	Medium	Not accepting mixed waste loads / organics / flammable Acceptance protocol	Building has fire walls to stop spread into facility OEMP includes emergency response plan (fire) / employee training on procedure Hose reel at the front Fire extinguishers PPE for personnel	Rare	Major	Medium	Rare	Minor	Low			Hi-Quality acknowledges that a major safety risk persists due to potential fatality in vehicle fire.
6	[Carpark / External] Reagent Receive	On-Land Transport (Driving)	Loss of control of reagent trucks	HCl (8 II) - Hazardous (Corrosive 1, Skin 1, Eye 1, Organ 3) Caustic Soda (8 II) - Hazardous (Corrosive 1, Skin 1A, Eye 1) Ferrous sulphate - Hazardous (Oral 4, Skin 2, Eye 2A, Aquatic 2) OCP - Hazardous (Skin 2, Eye 1, Organ 2) GGBFS - Hazardous (Skin 2, Eye 2A, Organ 3, Cancer 1A) PFA - Hazardous (Skin 2, Eye 2A, Cancer 1A, Organ 1, Aquatic 4) CKD - hazardous (Skin 1C, Eye 2B, Organ 3) Lime - Hazardous (Skin 2, Eye 1, Organ 3) Sodium silicate - Hazardous (Skin 2, Eye 2A) Organophilic Clays - Hazardous (Skin 2, Eye 2A, Organ 3) Pozzolans - Hazardous (Skin 2, Eye 2A, Organ 2, Cancer 1A) Bentonite - Hazardous (Skin 2, Eye 2A, Organ 3) Aluminium Sulphate -	Reagent truck driver error Poor markings, speeding, new driver	<b>Safety</b> Harm to personnel Damage to nearby vehicles in carpark (Escalated: Fire or Explosion) <b>Environment</b> Loss of containment of reagents, unwanted reactions, leak of reagent material beyond site boundary (Whyalla Place, Pollution of waterways / mixing with stormwater system / groundwater Release of dust / odours / biohazards	Rare	Severe	Low	Rare	Severe	Low	Reagents are non-reactive (cementitious) or natural (bacteria) Parking location - no interaction of reagent deliveries with waste trucks Trusted suppliers / packaging Infrequent deliveries - smaller quantities of material Site manager knowledge of deliveries / schedule	Spill kits OEMP emergency procedures PPE for personnel	Rare	Severe	Low	Rare	Severe	Low			Breach of packaging also required for this event.
7	[Carpark / External] Reagent Receive	General	Leak of reagent material from transport truck	Already a leak present when truck arrives at facility	Improper securing of reagent containers during transport Improper closing of truck storage Wheel generated dust movement	<b>Safety</b> Harm to personnel (skin contact, inhalation) <b>Environment</b> Leak of reagent material beyond site boundary (Whyalla Place), unwanted reactions. Pollution of waterways / mixing with stormwater system / ground water Release of dust and odours	Rare	Slight	Low	Rare	Slight	Low	Trusted suppliers Trained site manager	Spill kits OEMP response protocols PPE for personnel	Rare	Slight	Low	Rare	Slight	Low			

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
8	[Carpark / External] Reagent Receiving	Open Flame	Fire / Ignition	Vehicle fires How are reagents delivered? Separate trucks from separate companies?	Ignition source from waste truck (fuel leak, hot surfaces e.g., breaks)	<b>Safety</b> Harm to personnel <b>Environment</b> Release of toxic fumes (reagent or waste within facility)	Unlikely	Major	Medium	Unlikely	Minor	Low	Stable choice of reagents Known reagent schedule / reactions	Building has fire walls to stop spread into facility OEMP includes emergency response plan (fire) Hose reel at the front Fire extinguishers PPE for personnel / training	Rare	Major	Medium	Rare	Slight	Low			No flammable reagents used. Hi-Quality acknowledges that a major safety risk persists due to potential facility in vehicle fire. Truck frequency for reagent vehicles is far lower than waste trucks.
9	[Carpark / External] General	Natural and Environmental hazards (effect on surroundings)	Natural Events / Disasters	Accounting for floods	High rainfall above the 1 in 100 year floodline	<b>Safety</b> Inability to deliver waste <b>Environment</b> Overflow of waste from truck bed Release of untreated waste to nearby waterway and stormwater system	Rare	Slight	Low	Rare	Minor	Low	Scheduling of deliveries Shut-down protocol (OEMP flood event protocol) 7 stacking spaces inside facility		Rare	Slight	Low	Rare	Minor	Low	Include notification to delivery services of flooding resulting in facility shutdown in the OEMP	Arcadis on behalf of Hi-Quality	Facility above 1 in 500 year flood level.
10	[Carpark / External] General	Compliance / Regs	Noise Pollution	EPA has specifically outlined inadequacies in addressing the generated noise from the facility (sleep disturbance?) 81 trucks per day	Waste / reagent truck delivery during day and / or night	<b>Safety</b> Distruption to local commercial / recreational facilities Health impacts due to employee long term exposure Noise impacts and sleep disturbance for nearby residents	Possible	Slight	Low	Possible	Slight	Low	Built in an industrialised area 7 stacking spaces inside facility Traffic management and scheduling	Traffic manager directs drivers to turn off engines OEMP has noise and vibration management plan (working hours, practices to minimise)	Unlikely	Slight	Low	Unlikely	Slight	Low	Review number of waste / reagent delivery trucks daily to the facility Review noise pollution modelling and results to confirm if environmental standards are met	Arcadis on behalf of Hi-Quality	Hi-Quality commented that the throughput of the facility is being reconsidered and the initial suggestion of 81 trucks per day is being substantially reduced - expected to be closer to 40 (this is at maximum operational capacity). Yatala is around 20 / day.
11	[Carpark / External] General	Health	Arrival / Leaving facility		Poor lighting Car strikes person Uneven surface	<b>Safety</b> Harm to personnel <b>Environment</b> Soil and waste tracking in neighbouring streets Dust and odour	Possible	Minor	Medium	Possible	Slight	Low	OTMP - carparking management strategy Shift scheduling - not a high frequency of vehicles Induction of personnel on protocol		Possible	Minor	Medium	Unlikely	Slight	Low			It is noted that this is more of an OHS safety issue, hence similar safety risks are not covered for each stage of the facility as the HAZID / ENVID focuses on loss of containment / control scenarios.
12	[Compartment 1 - Exiting Warehouse] Wheel Wash / Weighbridge	Incompatible Mixing	Loose contaminated waste material enters site		Clogging / contamination of wheel well	<b>Safety</b> Exposure of personnel / personal items to waste <b>Environment</b> Contaminated wash water causes pollution of waterways / mixing with stormwater system / groundwater	Rare	Slight	Low	Rare	Slight	Low	Concrete treated with performance based sealant (70% design report)	Bunding of washing area	Rare	Slight	Low	Rare	Slight	Low			Arcadis noted that the wheel wash is a control.

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments	
13	[Compartment 1 - Existing Warehouse] Waste Trucks	On-Land Transport (Driving)	Loss of control of waste trucks / heavy machinery	EPA requests assessment of the movement of heavy machinery within the warehouse  Differs from HAZID-1 and HAZID-6 as this is now within the warehouse rather than the external receival area	Waste truck driver error  Poor markings, speeding, new driver, evening operations	<b>Safety</b> Harm to personnel (impact)  Damage to heavy vehicles (forklift, excavator, frontloader, mobile plant)  Damage to site equipment (dewatering, mobile plant)  <b>Environment</b> Mixing of waste batches, unwanted reactions, loss of containment beyond designated bays or beyond banded region of warehouse  Loss of containment of stored reagents  Release of dust and odours	Possible	Severe	Medium	Possible	Minor	Medium	SWIM protocols  Weigh bridge operator to guide to designated bay  Driver training	Bunding within warehouse to withstand 1 tanker load (20 KL) of lost waste (70% design report)  Entire building is at negative pressure (70% design report)  Scrubber / HVAC system  OEMP - emergency response plan	Unlikely	Severe	Medium	Unlikely	Minor	Low				Hi-Quality acknowledges the inherent risk associated with the use of heavy machinery.
14	[Compartment 1 - Existing Warehouse] Leachate Management System	General	Compromise of mechanical integrity	Refers to actual failure of piping network within warehouse	Crack - heavy machinery, waste trucks  Improper installation	<b>Environment</b> Leaching into groundwater  Release of leachate into sewer / local waterways  Cross-contamination of waste loads from overflow of system	Probable	Slight	Medium	Probable	Slight	Medium	Engineering design of leachate system  Regular inspections / maintenance program (OEMP)		Rare	Slight	Low	Rare	Slight	Low			Hi-Quality commented that waste materials are primarily non-biological material so odours are a minor issue.	
15	[Compartment 1 - Existing Warehouse] Leachate Management System	Toxic fluid	Leachate spill	Not much leachate in untreated soils	System blockage with solid waste material  Failure of waste effluent pump system  Overflow of underground holding tanks (Stage 1)	<b>Environment</b> Cross-contamination of waste piles  Unintended release of leachate to ground water / storm water system	Unlikely	Slight	Low	Unlikely	Severe	Medium	Waste types (drier soils) do not release excess quantities of leachate  Regular inspections / maintenance program (OEMP)	Bunding of facility  OEMP - spill response / incident response	Rare	Slight	Low	Rare	Severe	Low			Hi-Quality noted that all incoming waste materials treated at the facility have already been dug from environment.  A similar event has not occurred at Yatala during operation.  Personnel are not considered at risk due to minimal volumes of leachate expected from the waste materials.	
16	[Compartment 1 - Existing Warehouse] Pit A (Drill Mud)	Asphyxiates	Airborne particulate release	Any process requiring the relocation of drill muds (off loading from trucks, physical screening, loading for disposal offsite)  Unknown contaminants	Transfer from truck to storage  Improper operation of physical screening process	<b>Safety</b> Harm to personnel (inhalation)  <b>Environment</b> Transfer of dust beyond site boundary polluting air for nearby commercial / recreation / residential settings  Odour release	Rare	Slight	Low	Rare	Slight	Low	Drill muds are kept wet across entire treatment period  Known waste schedule / type	Enclosed / negative pressure of treatment facility (limits exposure)  HVAC / Scrubber system  Personnel PPE	Rare	Slight	Low	Rare	Slight	Low			Drill muds are inherently wet and do not give off particulates  No odours either	

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
17	[Compartment 1 - Existing Warehouse] Pit A (Drill Mud)	Dynamic situation hazards	Implosion of vacuum pressure truck	Not sure if credible, but is the only case where a vacuum tanker is used  Drill muds released under gravity	Pressure failure of vacuum tanker	<b>Safety</b> Harm to personnel (exposure to waste, injury from debris / implosion)  Damage to site equipment (dewatering)  <b>Environment</b> Loss of containment of non-contaminated drill mud  Mixing of waste batches / contamination of bays in Compartment 1	Rare	Major	Medium	Rare	Severe	Low	Drill muds are treated to a soil consistency (reloading does not require vacuum tanker)  Qualified transporters used to unload under supervision of site staff (met at unload point)	OEMP spill procedures  PPE for personnel	Rare	Major	Medium	Rare	Severe	Low			Hi-Quality acknowledges that a major safety risk persists due to potential fatality in vehicle implosion.
18	[Compartment 1 - Existing Warehouse] Pit A (Drill Mud)	General	Drill mud spill	Drill mud is non-contaminated, minimal hazard	Overfilling of drill mud pit  Improper decontamination of pit  Leak during physical separation (shaker sieve, desilter hydrocyclone, and decanter centrifuge)  Blockage of physical separation equipment  Inaccurate discharge / filling of waste truck  Compromise of pit lining	<b>Safety</b> Harm to personnel (contact with waste, injury from solid material)  <b>Environment</b> Cross-contamination of waste batches  Seepage into groundwater from pit	Unlikely	Minor	Low	Unlikely	Slight	Low	Engineered design of pit (HDPE liners of pit, earthen clay liner, concrete)  All tanks include overflow protection and alarms (OEMP)  Visual inspection of pits for faults	Bunding of facility (OEMP)  Emergency response plans (OEMP)  PPE for personnel	Unlikely	Minor	Low	Unlikely	Slight	Low			Hi-Quality and Arcadis confirmed that the underground pits have a three layer barrier to prevent leakage into the surrounding groundwater.
19	[Compartment 1 - Existing Warehouse] Pit A (Drill Mud)	On-Land Transport (Driving)	Overfilling of drill mud bays	EPA notes that treatment time is not sufficient to include both waste treatment as well as the analytical time to validate waste treatment techniques	Delays in analytical treatment protocols  Misbatching	<b>Safety</b> Rejection of incoming waste streams / disruption of treatment schedule  Accelerated levels of wear / corrosion on storage pits  <b>Environment</b> Longer than acceptable storage times for treated drill muds leading to odorous emissions (low odours)	Unlikely	Minor	Low	Unlikely	Minor	Low	Engineered design of pit (HDPE liners of pit, earthen clay liner, concrete)  All tanks include overflow protection and alarms (OEMP)  Visual inspection of pit  Supporting supervisor onsite during all unloadings	HVAC / Scrubber system  OEMP - emergency response  Personnel PPE	Unlikely	Minor	Low	Unlikely	Minor	Low			
20	[Compartment 1 - Existing Warehouse] Pit A (Drill Mud)	Incompatible Mixing	Unexpected / Unknown Contaminants	Need to be defined by Hi-Quality - are there any that are specifically monitoring for / pose a greater danger level?	Inaccurate generator waste certificate / incorrect waste classification  Mixing of waste batches (mislabelling / human error)  Transportation cross-contamination  Improper decontamination of pit prior to restock	<b>Safety</b> Exposure of personnel (skin contact)  <b>Environment</b> Unwanted reactions  Disruption to treatment schedule  Release of unintended contaminants to landfill or waterways through wastewater (contaminant dependent)	Possible	Minor	Medium	Possible	Minor	Medium	Drill mud initial location sourcing (low risk)  Visual observation of any contaminants / waste during offloading  Non-confining waste protocol (if hasn't been unloaded) - follow up with provider	Post-treatment analytical assessment  PPE for personnel	Rare	Minor	Low	Rare	Minor	Low	Define a protocol for unloaded contaminated drill muds and include in the OEMP	Arcadis on behalf of Hi-Quality	

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
21	[Compartment 1 - Existing Warehouse] Pit B (Sludge Pits)	Toxic fluid	Sludge spill	Sludge pits are below ground  Environmental consequences for: Soil: TPH, TRH, BTEXN, coal tar, CCA, BaP, Phenol, AC, heavy metals (Pb, Cr, Cu, As, Ni, Cd, Hg, Se, Ag) Sludge - all soil contaminants?	Overflowing of sludge pits  Aggressive mixing during bentonite dosing  Inaccurate discharge / filling of waste truck  Compromise of pit lining	<b>Safety</b> Harm to personnel  <b>Environment</b> Release of leachate beyond pit area, into sewer system, or into groundwater  Potential release of odour to surrounding industrial and residential neighbourhood  Vapour generation during mixing	Unlikely	Severe	Medium	Possible	Severe	Medium	Engineered design of pit (HDPE liners of pit, earthen clay liner, concrete)  All tanks include overflow protection and alarms (OEMP)  Visual inspection of pit  Supporting supervisor onsite during all unloadings	Leachate system  Scrubber / HVAC system  Bunding of facility (OEMP)  OEMP emergency / spill response  PPE for personnel	Unlikely	Severe	Medium	Unlikely	Severe	Medium			Hi-Quality and Arcadis confirmed that the underground pits have a three layer barrier to prevent leakage into the surrounding groundwater.
22	[Compartment 1 - Existing Warehouse] Pit B (Sludge Pits)	Toxic fluid	Bentonite spill	Sludge pits are below ground  Bentonite is a hazardous material (Skin 2, Eye 2A, Organ 3)	Malfunction of dosing system  Overflowing of sludge pits  Aggressive mixing during bentonite dosing	<b>Safety</b> Harm to personnel (inhalation)  Dosing of incorrect waste batch, unwanted reactions  <b>Environment</b> Potential air pollution due to the release of dust and particulate matter	Probable	Minor	Medium	Probable	Minor	Medium	Design of pits (layered with appropriate headroom)  Separation of sludge pits from soil treatment area  Transported in a bulk bag  Operator protocols / training / maintenance checks / induction	Spill kits  PPE for personnel	Rare	Minor	Low	Rare	Minor	Low			
23	[Compartment 1 - Existing Warehouse] Pit B (Sludge Pits)	Compliance / Regs	Incomplete waste treatment	EPA notes that most treatment protocols suggested have not been used at an industrial level, posing the risk of scale-up issues affecting treatment viability  Environmental consequences for: Soil: TPH, TRH, BTEXN, coal tar, CCA, BaP, Phenol, AC, heavy metals (Pb, Cr, Cu, As, Ni, Cd, Hg, Se, Ag) Sludge - all soil contaminants?	Large scale failure of lab tested waste treatment technique  Incorrect assessment of sludge type	<b>Safety</b> Harm to personnel  Damage to plant equipment (overflow of plate press, blockage of WWTP)  <b>Environment</b> Release of odours	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Redundancy through generator certificate and onsite testing (OEMP)  Testing post-treatment to verify conformity to waste regulations, if unacceptable further treatment is performed	PPE for personnel	Rare	Severe	Low	Rare	Severe	Low			
24	[Compartment 1 - Existing Warehouse] Bay C (ASS)	Toxic solid	ASS spill	Environmental consequences for acid sulfate release  Generally uncontaminated, can become acidic through exposure to moisture or oxygen  More so PASS, all naturally occurring	Improper operation of physical screening process  Inaccurate discharge / filling of waste trucks  Aggressive aglime mixing in high shear mixer	<b>Safety</b> Harm to personnel  <b>Environment</b> Cross-contamination of waste batches  Release of leachate beyond pit area  Discharge of ASS to surrounding soils and waterways when soils rewetted, resulting in reduced pH, decreased oxygen concentration in water and the release of heavy metals, acid and other contaminants, posing a risk to aquatic ecosystems and human health.  Minor odours	Unlikely	Minor	Low	Unlikely	Severe	Medium	Management procedures for transporting, screening, and mixing (OWMP)  Minimised exposure of soil to moisture (transforms PASS into ASS)	Enclosed / negative pressure of treatment facility (limits exposure)  HVAC / Scrubber system  Leachate system  OEMP spill response  PPE for personnel	Rare	Minor	Low	Rare	Severe	Low			Hi-Quality commented that most soil received is PASS and can only become ASS with moisture and oxygen, very mild acidic soil.

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
25	[Compartment 1 - Existing Warehouse] Bay C (ASS)	Toxic solid	Aglime spill	Aglime is a non-hazardous material	Aggressive mixing in high shear mixer	<b>Safety</b> Harm to personnel (inhalation) <b>Environment</b> Dosing of incorrect waste batch	Possible	Minor	Medium	Possible	Slight	Low	Transported in bulker bag PASS treatment protocol training (OWMP)	OEMP spill protocols PPE for personnel	Unlikely	Minor	Low	Unlikely	Slight	Low			
26	[Compartment 1 - Existing Warehouse] Bay C (ASS)	Compliance / Regs	Incomplete waste treatment	EPA notes that most treatment protocols suggested have not been used at an industrial level, posing the risk of scale-up issues affecting treatment viability  Environmental consequences for ASS release	Large scale failure of lab tested waste treatment technique  Incorrect dosing calculation  Quality issue with bulk aglime	<b>Environment</b> Impact to downstream treatment protocols (bioremediation / immobilisation)  Leachate out to water ways  Release of odours (low)	Unlikely	Minor	Low	Unlikely	Severe	Medium	Testing post-treatment to verify conformity to waste regulations, if unacceptable further treatment is performed	HVAC / Scrubber system	Rare	Minor	Low	Rare	Severe	Low			Landfills licenced to take PASS are fully lined
27	[Compartment 1 - Existing Warehouse] Bay C (ASS)	Incompatible Mixing	Unexpected / Unknown Contaminants	EPA notes the requirement for batch control to prevent cross-contamination  Cannot test for asbestos internally	Inaccurate generator waste certificate / incorrect waste classification  Mixing of waste batches (mislabelling / human error)  Transportation cross-contamination  Improper decontamination of pit prior to restock	<b>Safety</b> Exposure of personnel <b>Environment</b> Unwanted reactions  Reduction in treatment effectiveness and release of untreated ASS to downstream processes  Undetermined concentration of leachate released	Unlikely	Minor	Low	Unlikely	Severe	Medium	Generator screening / acceptance protocol  OEMP / OWMP have an unexpected finds protocol / non-conforming waste protocol initially  Onsite testing prior to treatment	PPE for personnel	Rare	Minor	Low	Rare	Severe	Low			
28	[Compartment 1 - Existing Warehouse] Bay C (ASS)	Asphyxiates	Airborne particulate release		Loading / unloading of waste with trucks  Physical screening	<b>Safety</b> Harm to personnel  Airborne particulates to surrounding community <b>Environment</b> Potential odour emissions	Possible	Minor	Medium	Possible	Minor	Medium	Dust suppression (water) unloading / loading / treatment  Visual inspection during treatment	Enclosed / negative pressure of treatment facility (limits exposure)  HVAC / scrubber system  Wheel wash - not tracking out dust  PPE for personnel	Unlikely	Minor	Low	Rare	Minor	Low			
29	[Compartment 1 - Existing Warehouse] Bay C (ASS)	Corrosive substances	Corrosion (Pit)	Aglime use  Also requested by EPA	Failure of cleaning / maintenance (improper decontamination)  Build-up of concentrated leachate  Use overtime	<b>Safety</b> Equipment failure <b>Environment</b> Loss of containment of ASS (bay are concrete) leading to contamination of ground water / storm water system	Unlikely	Slight	Low	Rare	Slight	Low	Leachate system  OWMP - treatment procedure / dosing  Bay decontamination  Regular inspection of bunding / general bay / pavement condition		Unlikely	Slight	Low	Rare	Slight	Low			
30	[Compartment 1 - Existing Warehouse] Pit B (Sludges) - Chemical Separation	Toxic fluid	Leachate release	Process is used to remove hydrocarbons before bioremediation or immobilisation	High dosing of surfactant surface tension releases high quantities of leachate	<b>Safety</b> Fire (ignition of hydrocarbon rich leachate)  Harm to personnel <b>Environment</b> Release into local water ways / ground water / storm water system	Unlikely	Minor	Low	Rare	Minor	Low	All tanks include overflow protection and alarms (OEMP)  Engineered design of pit (HDPE liners of pit, earthen clay liner, concrete)  Visual inspection of pit  Supporting supervisor onsite during all unloadings	Bunding (OEMP)  OEMP emergency / spill response  PPE for personnel	Rare	Minor	Low	Rare	Minor	Low			

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
31	[Compartment 1 - Existing Warehouse] Pit B (Sludges) Chemical Separation	Open Flame	Fire / Ignition	Process is used to remove hydrocarbons before bioremediation or immobilisation	Leachate rich in hydrocarbons	<b>Safety</b> Harm to personnel  <b>Environment</b> Generation of toxic vapours (BETX, BaPs, phenols, etc.) and odours release beyond site boundaries affecting nearby community and ecosystem	Rare	Minor	Low	Rare	Minor	Low	No flammable waste accepted on site  Underground pit design  Segregation of pits from bays	Fire extinguishers onsite (fire designs)  OEMP - fire protocols  PPE for personnel	Rare	Minor	Low	Rare	Minor	Low	Add an action to stop any maintenance / hot works activities near sludge pits (even when empty) in the OWMP. Adapted from existing company wide HI-Quality hot works protocol	Arcadis on behalf of HI-Quality	Company wide protocol of hot works protocol  Material accepted is combustible and not flammable
32	[Compartment 1 - Existing Warehouse] Bay D (Immobilisation)	Toxic solid	Soil spill	Environmental consequences for: Soil: TPH, TRH, BTEXN, coal tar, CCA, BaP, Phenol, AC, heavy metals (Pb, Cr, Cu, As, Ni, Cd, Hg, Se, Ag)	Improper operation of physical screening process  Incorrect transfer of soil to high shear mixer  Transfer of soil along shear mixer belt  Blockage and overflow of mixer	<b>Safety</b> Harm to personnel (inhalation)  Damage to equipment  <b>Environment</b> Cross-contamination with other waste loads  Generation of dust released to atmosphere  Odour release	Possible	Minor	Medium	Rare	Minor	Low	Stockpile site limits  Push walls in bays give minimum 1 m clearance  Operator induction of shear mixer / heavy equipment (OWMP)	Leachate system  Enclosed / negative pressure of treatment facility (limits exposure)  HVAC / Scrubber system  OEMP - spill beyond bay (incident procedures)  PPE for personnel	Possible	Slight	Low	Rare	Minor	Low			Similar to general operation of waste facility
33	[Compartment 1 - Existing Warehouse] Bay D (Immobilisation)	Compliance / Regs	Incomplete waste treatment	EPA suggests that oxidation times are inaccurate  EPA notes that most treatment protocols suggested have not been used at an industrial level, posing the risk of scale-up issues affecting treatment viability  EPA specifically requests further info on treatment of coal tar soil, heavy metal soil, and bulk soils  Environmental consequences for: Soil: TPH, TRH, BTEXN, coal tar, CCA, BaP, Phenol, AC, heavy metals (Pb, Cr, Cu, As, Ni, Cd, Hg, Se, Ag)	Large scale failure of lab tested waste treatment technique  Incorrect initial classification of waste batch  Accidental treatment of incorrect waste material  Improper mixing  Excess humidity / moisture (cement to moisture ratio) preventing complete cure  Generalised treatment to 'family' of chemicals is ineffective	<b>Safety</b> Harm to personnel during concrete cutting - release / exposure to untreated waste (dust)  <b>Environment</b> Release of untreated waste to landfill / contaminated wastewater or leachate to local waterways  Release of generated dust	Possible	Minor	Medium	Possible	Minor	Medium	Redundancy through generator certificate and onsite testing prior to treatment (OEMP)  Each load is individually examined to design treatment protocol (OWMP)  Testing post-treatment to verify conformity to waste regulations, if unacceptable further treatment is performed	PPE for personnel	Rare	Slight	Low	Rare	Minor	Low			HI-Quality has reported no issues with large batch testing at Yatala - if batch is too large, it is split into smaller batches and treated individually
34	[Compartment 1 - Existing Warehouse] Bay D (Immobilisation)	Incompatible Mixing	Unexpected / Unknown Contaminants	EPA notes the requirement for batch control to prevent cross-contamination	Inaccurate generator waste certificate / incorrect waste classification  Mixing of waste batches (mislabelling / human error)  Transportation cross-contamination  Improper decontamination of pit prior to restock	<b>Safety</b> Inhalation - specifically asbestos contamination (not tested for onsite)  <b>Environment</b> Unwanted reactions  Distruption to treatment protocol and release of untreated waste to landfill / contaminated wastewater or leachate to local waterways	Probable	Severe	Medium	Rare	Minor	Low	Redundancy through generator certificate and onsite testing prior to treatment (OEMP)  Visual inspection  Non-conforming protocol  Water suppression for dust	Leachate system  PPE for personnel	Unlikely	Minor	Low	Rare	Minor	Low			

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
35	[Compartment 1 - Existing Warehouse] Bay D (Immobilisation)	Toxic solid	Cementitious stabiliser spill	EPA notes the requirement for how these spills will be managed  Hazardous materials: OCP, GGBFS (carcinogenic), PFA (carcinogenic, danger to aquatic life), CKD Lime, Sodium silicate, organophilic clay, pozzolans (carcinogenic), bentonite	Improper mixing of cement with waste batch	<b>Safety</b> Harm to personnel (inhalation of particulate matter)  <b>Environment</b> Spread of particulate matter beyond site boundaries to pollute surrounding air	Possible	Minor	Medium	Rare	Slight	Low	Bulk container transport when moving  OWMP for immobilisation	Enclosed / negative pressure of treatment facility (limits exposure)  HVAC / Scrubber system  OEMP spill response  PPE for personnel	Unlikely	Minor	Low	Rare	Slight	Low			
36	[Compartment 1 - Existing Warehouse] Bay D (Immobilisation)	Incompatible Mixing	Mixing of contaminated waste from other stockpiles (in high shear mixer)	EPA requests how will cross contamination of Hazardous waste stockpiles be prevented	Remenant waste in excavator during transfer  Inadequate decontamination procedure  Residue material left on high shear mixer belt  Overflow of liquid contaminant from bund	<b>Environment</b> Unwanted reactions  Distruption to treatment protocol and release of untreated waste to landfill / contaminated wastewater or leachate to local waterways	Possible	Slight	Low	Unlikely	Minor	Low	Types of soil waste (non-hazardous and similar contaminant types)  Decontamination procedure  Individual treatment of batches (treatment / storage)  OWMP - management requirements  Overseen by supervisor (visual inspection)	Testing post-treatment to verify conformity to waste regulations, if unacceptable further treatment is performed	Unlikely	Slight	Low	Rare	Slight	Low			Hi-Quality commented that the relative levels of material remaining in bays are negligible (kg of remenant material vs tonnes of new batch)  Soils not hazardous  General acceptance of a wide variety of contaminant types across the facility  Most likely place is soil unloading area (Bay G)
37	[Compartment 1 - Existing Warehouse] Bay D (Immobilisation)	Asphyxiates	Airborne particulate release		Concrete cutting (curred)  Removal of cured waste  Improper operation of heavy equipment  Physical screening	<b>Safety</b> Harm to personnel (silicosis (inhalation))  <b>Environment</b> Release of concrete dust to the air	Possible	Minor	Medium	Rare	Slight	Low	Bulk container transport when moving  OWMP for immobilisation	Enclosed / negative pressure of treatment facility (limits exposure)  HVAC / Scrubber system  OEMP spill response  PPE for personnel	Unlikely	Minor	Low	Rare	Slight	Low			
38	[Compartment 1 - Existing Warehouse] Bay D (Immobilisation)	Open Flame	Fire / Ignition	Hydrocarbon presence	Soils containing hydrocarbons (TPH, PAH, BTEXN)  Activated carbon waste  Heavy machinery ignition source	<b>Safety</b> Harm to personnel  Release of toxic fumes (Escalated: Explosion)  <b>Environment</b> Pollution of local air quality spreading to nearby residential commerial, and recreational facilities	Rare	Severe	Low	Unlikely	Minor	Low	Waste type (low concentration of hydrocarbons accepted < 5% - worst case scenario)  Non-flammable waste types  Enclosed building  Hot works protocol (Hi-Quality company wide)	OEMP - fire management  Fire design features (extinguishers, detectors)  PPE for personnel	Rare	Minor	Low	Rare	Minor	Low			

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
39	[Compartment 1 - Existing Warehouse] Bay E (Bioremediation)	Compliance / Regs	Bioremediation treatment	EPA specifically requested environmental impact of bioremediation  Gases released specifically during treatment	Breakdown of HVAC system  Release of gases during bioremediation  Release of particulates or odours during aeration  Release of BTEX compounds  Use of urea as a nutrient	<b>Safety</b> Harm to personnel - aerosolised carcinogenic compounds (benzene, naphthalene, benzopyrene)  Release of CO2  <b>Environment</b> Reduction of air quality for local residences, commercial and recreational businesses	Possible	Severe	Medium	Unlikely	Minor	Low	Continuous addition of moisture during the process (no dust)  Temperature monitoring to ensure bacteria remain viable  Discrete sizing of waste batches	Enclosed / negative pressure of treatment facility (limits exposure)  HVAC / Scrubber system  PPE for personnel	Rare	Slight	Low	Rare	Minor	Low	Clarify bioremediation treatment protocol, specifically if aeration occurs through pumps or is performed manually by a front end loader	Arcadis on behalf of Hi-Quality	Soil 30% - 40% moisture content  Hi-Quality commented they are only required to meet landfill requirements not environmental criteria  Mixing can be performed through front end loader or air pumps and tubes at the bottom of the pile for continuous mixing  Hi-Quality commented that <i>Bacillus cereus</i> is the dominant bacteria, however, the supplier provides a mixture with other species. The specific mixture has not reported any odour issues during operation at Yatala.
40	[Compartment 1 - Existing Warehouse] Bay E (Bioremediation)	Toxic solid	Soil spill	EPA specifically requested environmental impact of bioremediation  Environmental consequences for: Sol: PAH, TPH, TRH, BTEXN, Phenol	Improper operation of physical screening process	<b>Safety</b> Harm to personnel (inhalation)  <b>Environment</b> Release of bacteria into waterways ( <i>Bacillus cereus</i> )	Possible	Minor	Medium	Rare	Minor	Low	Stockpile size limits  Push walls in bays give minimum 1 m clearance  Operator induction of shear mixer / heavy equipment (OWMP)	OEMP - spill beyond bay (incident procedures)  Leachate system to recirculate liquid waste / bacteria  PPE for personnel	Possible	Slight	Low	Rare	Minor	Low			Hi-Quality noted that the bacteria is commonly used for diesel oil  Bacteria typically sold with a few other variants but <i>B. cereus</i> is the dominant
41	[Compartment 1 - Existing Warehouse] Bay E (Bioremediation)	Toxic fluid	Biological material spill	Need more information on the bacteria type - but most likely non-hazardous	Improper handling - human error  Compromise of container	<b>Safety</b> Harm to personnel  <b>Environment</b> Release of excess bacteria quantities through leachate system  Release of contaminate to nearby waterway and ecosystem	Rare	Slight	Low	Rare	Slight	Low	5 L container of bacteria for 50 tonne treatment (minimal reagent volume)  OWMP for bioremediation  Chosen bacteria strain (SDS for bacteria)	PPE for personnel	Rare	Slight	Low	Rare	Slight	Low			
42	[Compartment 1 - Existing Warehouse] Bay E (Bioremediation)	Compliance / Regs	Incomplete waste treatment	EPA suggests that factors for successful bioremediation treatment are difficult to predict with certainty  Environmental consequences for: Sol: PAH, TPH, TRH, BTEXN, Phenol	Incorrect initial classification of waste batch (i.e., high levels of benzopyrene)  Accidental treatment of incorrect waste material  Inactive bacteria / natural variation in biological performance (shelf life / expiry)  Improper mixing or aeration  Incomplete chemical separation (remaining hydrocarbons / tar)	<b>Environment</b> Release of strong odours (death of bacteria)  Release of untreated waste to landfill / contaminated wastewater or leachate to local waterways	Possible	Minor	Medium	Possible	Minor	Medium	Redundancy through generator certificate and onsite testing prior to treatment (OEMP)  Each load is individually examined to design treatment protocol (OWMP)  Temperature and moisture content monitoring throughout treatment	Landfill site standards  Testing post-treatment to verify conformity to waste regulations, if unacceptable further treatment is performed  PPE for personnel	Rare	Slight	Low	Rare	Minor	Low			Hi-Quality commented that copper will kill bacteria - needs to be immobilised prior to treatment

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
43	[Compartment 1 - Existing Warehouse] Bay E (Bioremediation)	Open Flame	Fire / Ignition	Hydrocarbon presence (same as immobilisation)	Soils containing TPH Large quantities of organic material	<b>Safety</b> Harm to personnel Release of fumes (Escalated: clean burning fire) <b>Environment</b> Pollution of local air quality spreading to nearby residential, commercial, and recreational facilities	Rare	Severe	Low	Unlikely	Minor	Low	Waste type (low concentration of hydrocarbons accepted < 5% - worst case scenario) Non-flammable waste types Hot works protocol (Hi-Quality company wide)	Enclosed / negative pressure of treatment facility (limits exposure) HVAC / Scrubber system OEMP - fire management Fire design features (extinguishers, detectors) PPE for personnel	Rare	Minor	Low	Rare	Minor	Low			
44	[Compartment 1 - Existing Warehouse] Bay E (PFAS Soil)	Toxic solid	PFAS soil spill	No treatment is given to this material Environmental consequences for PFAS	Loading / unloading of waste with trucks	<b>Safety</b> Harm to personnel (inhalation) <b>Environment</b> Release of PFAS contaminated water to leachate system and ecosystem	Possible	Minor	Medium	Rare	Minor	Low	Stockpile size limits Push walls in bays give minimum 1 m clearance Operator induction of shear mixer / heavy equipment (OWMP) Supervision during offloading and reloading procedures	OEMP - spill beyond bay (incident procedures) Bunding around PFAS bay isolating from the warehouse floor PPE for personnel	Possible	Slight	Low	Rare	Minor	Low	Confirm and document inhalation limits for human safety and the environment of PFAS compared to accepted contamination limits for landfill	Arcadis on behalf of Hi-Quality	Hi-Quality confirmed that Prestons WTF is a holding facility before any PFAS waste is sent to QLD (immobilisation) or VIC (thermal treatment).  Cannot take hazardous levels of PFAS, only restricted levels (included in OWMP).  Hi-Quality confirmed that the PFAS soil will remain moist to reduce airborne particulates and inhalation risks.  Solid soil spills were noted to be a part of normal operation, however, these breaches occurred in a minor amount that do not present a significant safety hazard. The solid nature of the waste and the location within the enclosed warehouse does not provide a logical pathway for release to the environment.
45	[Compartment 1 - Existing Warehouse] Bay E (PFAS Soil)	Incompatible Mixing	Cross-Contamination	EPA has suggested that it not be stored at the facility	Improper storage Human error with batch handling Failed seal in storage bay	<b>Environment</b> Failure in waste treatment of surrounding batches (unwanted reactions) Release of PFAS through solid waste batches or contaminated water to leachate system	Possible	Minor	Medium	Rare	Minor	Low	PFAS levels are already minimal (contamination would be a residual amount) - eliminated through restricted levels of PFAS accepted at facility OTMP - waste scheduling		Rare	Minor	Low	Rare	Minor	Low			Hi-Quality confirmed that all contaminated soils will go to a regulated landfill
46	[Compartment 1 - Existing Warehouse] Bay G (Bulk Soil)	Toxic solid	Soil spill	Soils first stored here for initial physical screening then transferred to more specific bays Environmental consequences for: Soil: TPH, TRH, BTEXN, coal tar, CCA, BaP, Phenol, AC, heavy metals (Pb, Cr, Cu, As, Ni, Cd, Hg, Se, Ag) Similar to immobilisation soil spill	Improper operation of physical screening process Inaccurate discharge / filling of waste trucks	<b>Environment</b> Release of mixed contaminant leachate	Possible	Minor	Medium	Rare	Minor	Low	Stockpile size limits Push walls in bays give minimum 1 m clearance Operator induction of shear mixer / heavy equipment (OWMP)	Leachate system OEMP - spill beyond bay (incident procedures) PPE for personnel	Possible	Slight	Low	Rare	Minor	Low			Solid soil spills were noted by Hi-Quality to be a part of normal operation, however, these breaches occurred in a minor amount that do not present a significant safety hazard. The solid nature of the waste and the location within the enclosed warehouse does not provide a logical pathway for release to the environment.

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
47	[Compartment 1 - Existing Warehouse] Bay G (Bulk Soil)	Incompatible Mixing	Cross-Contamination	Similar to immobilisation mixing of contaminated waste	Improper operation of physical screening process Inaccurate discharge / filling of waste trucks Degradation of bay lining	<b>Environment</b> Reduction of specific waste treatment effectiveness due to new contaminants	Possible	Slight	Low	Unlikely	Minor	Low	Types of soil waste (non-hazardous and similar possible contaminant)  Decontamination procedure  Individual testing and treatment design for batches  OWMP - management requirements  Overseen by supervisor (visual inspection)	Testing post-treatment to verify conformity to waste regulations, if unacceptable further treatment is performed	Unlikely	Slight	Low	Rare	Slight	Low			
48	[Compartment 1 - Existing Warehouse] Reagent Storage	Incompatible Mixing	Different reagent spills	EPA specifically requests consideration of the stored reagents on site and the environmental controls  Liquids stored in IBCs  Powders stored in bags  List of hazardous reagents present: Ferrous sulphate (Aquatic), Aluminium sulphate (Aquatic), HCl, Caustic Soda, Decon 90	Human error - waste truck, heavy machinery, on-foot collision  Improper / degradation of packaging	<b>Safety</b> Harm to personnel (skin, eye, respiratory, carcinogenic)  Corrosion/damage to bunding  Unwanted reactions  <b>Environment</b> Release of undiluted chemicals to waterways (danger to aquatic life)	Unlikely	Severe	Medium	Rare	Severe	Low	OEMP stating segregation according to Australian guidelines  Operator training / handling procedures	Spill kits  Fire extinguishers  Specific bunding isolating reagent storage from warehouse floor  Leachate diversion system  PPE for personnel	Rare	Severe	Low	Rare	Severe	Low			
49	[Compartment 1 - Existing Warehouse] Dewatering	Toxic fluid	Leachate release	Similar to sludge spill	Overflow of dewatering equipment  Inaccurate discharge from feed tank / truck	<b>Safety</b> Harm to personnel  Cross-contamination of waste batches  <b>Environment</b> Release of untreated waste to sewer system	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Enclosed pump system  Supervisor observing treatment	Bunding within main warehouse floor (OEMP)  Leachate system to WWTP  OEMP emergency / spill response  PPE for personnel	Unlikely	Severe	Medium	Unlikely	Severe	Medium			Hi-Quality acknowledges the higher risk associated with this piece of equipment due to the higher quantity of liquid waste and the proximity of the unit to the facility entrance.
50	[Compartment 1 - Existing Warehouse] General	Compliance / STDS	Floor degradation	Similar to leachate system loss of mechanical integrity	Waste / reagent trucks  Internal use of heavy machinery	<b>Safety</b> Uneven surfaces disrupting machinery operation leading to loss of containment of waste materials  Harm to personnel (trips / injury)  Build up of contaminated material in cracks / faults	Probable	Slight	Medium	Probable	Slight	Medium	Regular inspections / maintenance program (OEMP)  Visual inspections		Rare	Slight	Low	Rare	Slight	Low			
51	[Compartment 1 - Existing Warehouse] General	Compliance / Regs	Acceptance of asbestos contaminated materials	Similar to immobilisation contaminant	Incorrect generator certificate  Human error mixing up batches  Cross-contamination during transport	<b>Safety</b> Harm to personnel (inhalation - e.g., dusting during sieving, aeration for bioremediation)  <b>Environment</b> Release of asbestos for landfill	Probable	Severe	Medium	Rare	Minor	Low	Work conducted with trusted / known / reputable suppliers  Visual inspection	Water suppression for dust  PPE for personnel	Unlikely	Minor	Low	Rare	Minor	Low			Hi-Quality confirmed that waste generators are required to provide a detailed waste analysis prior to acceptance of the waste on site and if unacceptable waste (i.e., asbestos) is discovered, the waste is returned and incident recorded in the rejected wastes register.

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
52	[Compartment 1 - Existing Warehouse] General	Compliance / Regs	Noise Pollution	EPA has specifically outlined inadequacies in addressing the generated noise from the facility	Heavy machinery operation Treatment equipment operation	<b>Safety</b> Long term health effects for employees  Distruption to nearby recreational / industrial businesses	Possible	Slight	Low	Possible	Slight	Low	Built in an industrialised area	Enclosed warehouse  OEMP has noise and vibration management plan (working hours, practices to minimise)  PPE for personnel	Unlikely	Slight	Low	Unlikely	Slight	Low			
53	[Compartment 1 - Existing Warehouse] General	Natural and Environmental hazards (effect on surroundings)	Natural Events (Flooding)	EPA has specifically requested further insight into the leachate and water management infrastructure	High rainfall Crack in the roof	<b>Safety</b> Cross-contamination of waste loads  Unwanted reactions  Harm to personnel  <b>Environment</b> Excess leachate released into natrual waterways/sewer system  Harm to nearby ecosystem	Rare	Severe	Low	Rare	Severe	Low	Building built to Australian standards  Reagents stored above flood level  Entire facility is above the 1 in 500 flood level	Bunding of warehouse floor  WWTP / leachate system filter / storage tanks	Rare	Severe	Low	Rare	Severe	Low			
54	[Compartment 1 - Existing Warehouse] General	Corrosive substances	Compromise of bunding (Mechanical / Corrosion)	EPA has specifically requested further insight into the leachate and water management infrastructure	Collision of heavy machinery / waste trucks Exposure to waste treatment loads / reagents	<b>Environment</b> Release of leachate beyond bay designation  Cross-contamination of waste loads	Rare	Slight	Low	Unlikely	Minor	Low	Regular maintenance checks	Double bunding (pits and facility)	Rare	Slight	Low	Rare	Minor	Low			
55	[Compartment 1 - Existing Warehouse] General	Compliance / STDS	Pit Decontamination	Addressing the risk of repeated contact with Decon90 while decontaminating waste pits	Consistent use of Decon90 use	<b>Safety</b> Harm to personnel  <b>Environment</b> Release of undiluted solution to waterways	Possible	Minor	Medium	Rare	Minor	Low	Small quantities handled  OEMP - inductions and site management	Safety showers and personal decontamination  PPE used during decontamination procedure	Rare	Minor	Low	Rare	Minor	Low			
56	[Compartment 2 - WWTP] Holding Tanks (4 x 135 KL)	Toxic fluid	Wastewater spill	2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids  Environmental consequences for: Liquid waste: TPH, PAH, heavy metals, organics PFAS Liquid waste  Similar to sludge spill	Inaccurate unloading of waste truck Leak in tank Overflow of tank Pump failure	<b>Safety</b> Harm to personnel (saturation with liquid waste)  <b>Environment</b> Mixing of liquid waste batches  Contamination of drill mud  Partial flooding of compartment 1  Leak to outside of building confines (soil / waterways / groundwater)	Possible	Severe	Medium	Unlikely	Severe	Medium	All tanks include overflow protection and alarms (OEMP)  Visual inspection during loading / operation  Training / use of trusted transport operators  Maintenance checks on tank integrity	Bunding (OEMP) (for WWTP and Compartment 1)  OEMP emergency / spill response  Isolation of processing line with valves  PPE for personnel	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Classify disposal protocols for liquid waste spillages within WWTP. Define if recirculation through the system or pumping out and disposal off site is required  Clarify the connection of the leachate retrieval system to the WWTP holding tanks. Any leachate returned from Compartment 1 must be treated in the PFAS line due to the potential for contamination from the stored soil.	Arcadis on behalf of Hi-Quality	Bunding of WWTP accounts for 110% of the volume of the largest vessel in the WWTP  Batch process with manual controls for pumps (< 1 hr)  Hi-Quality and Arcadis commented on the possibility of trucks to draw waste liquid out and dispose offsite to licensed facilities in the event of a loss of containment.

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
57	[Compartment 2 - WWTP] Coalescing Plate Oil Separator	Toxic fluid	Wastewater spill	2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids  Environmental consequences for: Liquid waste: TPH, PAH, heavy metals, organics PFAS Liquid waste  Similar to holding tank wastewater spill Check personnel placement and leachate system	Overflow of separator  High / uncontrolled inflow  Machinery malfunction	<b>Safety</b> Harm to personnel (saturation with liquid waste)  <b>Environment</b> Mixing of liquid waste batches  Leak to outside of building confines (soil/ waterways / groundwater)	Possible	Severe	Medium	Possible	Severe	Medium	Supporting supervisor  Equipment alarms  Visual inspection during operation  OWMP protocol and operator training  Maintenance checks on equipment	Bunding of WWTP (OEMP)  OEMP emergency / spill response  PPE for personnel	Unlikely	Severe	Medium	Unlikely	Severe	Medium			
58	[Compartment 2 - WWTP] Coalescing Plate Oil Separator	Toxic fluid	Separation of oil (Oil spill)	2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids	High inflow  Machinery malfunction	<b>Safety</b> Oil overflow and potential ignition source  Harm to personnel (saturation with liquid waste, inhalation)  <b>Environment</b> Leak to outside of building confines (soil / waterways / groundwater)  Release fumes / odours	Unlikely	Minor	Low	Unlikely	Minor	Low	Dual operation team  Equipment alarms  Visual inspection during operation  OWMP protocol and operator training  Maintenance checks on equipment	Bunding of WWTP (OEMP)  OEMP emergency / spill response  PPE for personnel	Rare	Minor	Low	Rare	Minor	Low			Stored in 1 kL IBC  Hi-Quality commented that the potential volume of oil will be low mitigating some of the risk, however, the concentrated nature of the removed oil still presents an inherent risk.
59	[Compartment 2 - WWTP] Coalescing Plate Oil Separator	Open Flame	Fire / Ignition	2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids	Machinery malfunction  External ignition source (operator, office) against protocol	<b>Safety</b> Harm to personnel  Damage to equipment  <b>Environment</b> Release of hazardous vapours / fumes  Pollution of local air quality spreading to nearby residential, commercial, and recreational facilities  Spread to compartment 1 waste piles	Rare	Severe	Low	Rare	Minor	Low	Fire wall enclosing compartments  Fire shutter	OEMP - Fire reel, extinguisher  PPE for personnel	Rare	Severe	Low	Rare	Minor	Low			
60	[Compartment 2 - WWTP] Mixing Tank (50 KL - Batch)	Toxic fluid	Wastewater spill	2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids  Environmental consequences for: Liquid waste: heavy metals, organics PFAS Liquid waste  Similar to holding tank wastewater spill Check personnel placement and leachate system	Overflow from incoming waste stream  Overflow from incoming dosing agents  Overmixing of system	<b>Safety</b> Harm to personnel (saturation with liquid waste)  <b>Environment</b> Pollution of soil, groundwater and local waterways	Possible	Severe	Medium	Unlikely	Severe	Medium	Dual operation team  All tanks include overflow protection and alarms (OEMP)  Visual inspection during loading / operation  Operator training  Maintenance checks on tank integrity	Bunding of WWTP (OEMP)  OEMP emergency / spill response  Isolation of processing line with valves  PPE for personnel	Rare	Severe	Low	Rare	Severe	Low			
61	[Compartment 2 - WWTP] Mixing Tank (50 KL - Batch)	Incompatible Mixing	Incompatible mixing	2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids  Addition of incorrect additives or incorrect quantities which may cause undesirable reactions	Human error  Treatment miscalculation  Improper labelling / confusion of reagents	<b>Safety</b> Unwanted reactions (heat generation, toxic vapour generation)  <b>Environment</b> Unreacted waste moving through treatment process	Possible	Minor	Medium	Rare	Minor	Low	Dilute acid / caustic reagent  Relative volume of liquid waste compared to added reagents  OWMP - treatment protocols	PPE for personnel	Unlikely	Minor	Low	Rare	Minor	Low			

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
62	[Compartment 2 - WWTP] Mixing Tank (50 KL - Batch)	Toxic fluid	Hydrochloric acid (37 wt.%) spill	Hazardous Corrosive 1, Skin 1, Eye 1, Organ 3  2 sets of each equipment - one for PFAS liquids and one for non-PFAS liquids	Pump malfunction  Leak in piping	<b>Safety</b> Harm to personnel  Damage to equipment  <b>Environment</b> Improper dosing and incomplete treatment of waste water  Pollution of soil, groundwater and local waterways	Possible	Severe	Medium	Rare	Minor	Low	Use of relatively dilute acid  OWMP - Mixing protocols / Operator training  Regular maintenance checks on pumps (preventative maintenance to change diaphragms)  Isolation valves on processing lines  Dual operation team  Plant operators carry a two-way radio at all times	Bunding of WWTP (OEMP)  Emergency shower  PPE for personnel	Unlikely	Severe	Medium	Rare	Minor	Low	Update preventative maintenance plan for HCl diaphragm pump in the OEMP	Arcadis on behalf of Hi-Quality	Hi-Quality and Arcadis confirmed that all transport of liquid waste occurs within the site boundary or the enclosed facility. Hence, any leakage as a result of wear or malfunction of pumps or breach of piping will be contained onsite within the capture range of the leachate system.
63	[Compartment 2 - WWTP] Mixing Tank (50 KL - Batch)	Toxic fluid	Caustic soda (30 wt.%) spill	Hazardous Corrosive 1, Skin 1A, Eye 1  2 sets of each equipment - one for PFAS liquids and one for non-PFAS liquids	Pump malfunction  Leak in piping	<b>Safety</b> Harm to personnel  Damage to equipment  <b>Environment</b> Improper dosing and incomplete treatment of waste water  Pollution of soil, groundwater and local waterways	Possible	Severe	Medium	Rare	Minor	Low	Use of relatively dilute base  OWMP - Mixing protocols / Operator training  Regular maintenance checks on pumps (preventative maintenance to change diaphragms)  Isolation valves on processing lines  Dual operation team  Plant operators carry a two-way radio at all times	Bunding of WWTP (OEMP)  Emergency shower  PPE for personnel	Unlikely	Severe	Medium	Rare	Minor	Low	Update preventative maintenance plan for caustic soda diaphragm pump in the OEMP	Arcadis on behalf of Hi-Quality	Hi-Quality and Arcadis confirmed that all transport of liquid waste occurs within the site boundary or the enclosed facility. Hence, any leakage as a result of wear or malfunction of pumps or breach of piping will be contained onsite within the capture range of the leachate system.
64	[Compartment 2 - WWTP] Mixing Tank (50 KL - Batch)	Toxic solid	Aluminium sulfate (28 wt.%) spill	Hazardous Skin 1A, Eye 1, Oral 4, Cell Mutagenicity 2, Aquatic 2  2 sets of each equipment - one for PFAS liquids and one for non-PFAS liquids	Mishandling of 20 kg by operator	<b>Safety</b> Harm to personnel  <b>Environment</b> Environmental impact on aquatic life if released to water ways  Improper dosing and incomplete treatment of waste water  Pollution of soil, groundwater and local waterways	Rare	Minor	Low	Rare	Minor	Low	Maximum limits of reagents transported (OEMP)	Scrubber / HVAC system  Spill kits (OEMP)  PPE for personnel	Rare	Minor	Low	Rare	Minor	Low	Draft handling and transport procedures for mixing tank reagents in the the OEMP	Arcadis on behalf of Hi-Quality	
65	[Compartment 2 - WWTP] Mixing Tank (50 KL - Batch)	Toxic fluid	Polymer spill	Polymer not specified  2 sets of each equipment - one for PFAS liquids and one for non-PFAS liquids	Mishandling of 20 kg by operator	<b>Need further polymer details</b>  <b>Improper dosing and incomplete treatment of waste water</b>	Rare	Minor	Low	Rare	Minor	Low	Maximum limits of reagents transported (OEMP)	Scrubber / HVAC system  Spill kits (OEMP)  PPE for personnel	Rare	Minor	Low	Rare	Minor	Low	Draft handling and transport procedures for mixing tank reagents in the the OEMP  Update mixing tank procedure to include polymer type in OEMP	Arcadis on behalf of Hi-Quality	

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
66	[Compartment 2 - WWTP] Mixing Tank (50 KL - Batch)	Toxic solid	Activated carbon spill	Non-hazardous 2 sets of each equipment - one for PFAS liquids and one for non-PFAS liquids	Mishandling of 20 kg by operator	<b>Safety</b> Formation of combustible carbon cloud - fire / ignition  <b>Environment</b> Improper dosing and incomplete treatment of waste water	Unlikely	Severe	Medium	Rare	Minor	Low	Running of air operated pumps, no electric motors reducing ignition sources  Downstream equipment using AC to further treat relevant contaminants preventing environmental impacts	Scrubber / HVAC system  PPE for personnel	Rare	Severe	Low	Rare	Minor	Low	Draft handling and transport procedures for mixing tank reagents in the the OEMP  Include action in the OEMP to cease operation of WWTP in the case of an activated carbon spill	Arcadis on behalf of Hi-Quality	
67	[Compartment 2 - WWTP] Mixing Tank (50 KL - Batch)	Toxic solid	Magnesium oxide spill	Non hazardous 2 sets of each equipment - one for PFAS liquids and one for non-PFAS liquids	Mishandling of 20 kg by operator	<b>Environment</b> Improper dosing and incomplete treatment of waste water  Potential to alter nearby soil conditions and effect ecosystems	Rare	Minor	Low	Rare	Minor	Low	Maximum limits of reagents transported (OEMP)	Scrubber / HVAC system  Spill kits (OEMP)  PPE for personnel	Rare	Minor	Low	Rare	Minor	Low	Draft handling and transport procedures for mixing tank reagents in the OEMP	Arcadis on behalf of Hi-Quality	
68	[Compartment 2 - WWTP] Mixing Tank (50 KL - Batch)	Toxic solid	Ferrous sulfate spill	Hazardous (Oral 4, Skin 2, Eye 2A, Aquatic 2) 2 sets of each equipment - one for PFAS liquids and one for non-PFAS liquids	Mishandling of 20 kg by operator	<b>Environment</b> Improper dosing and incomplete treatment of waste water	Rare	Minor	Low	Rare	Minor	Low	Maximum limits of reagents transported (OEMP)	Scrubber / HVAC system  Spill kits (OEMP)  PPE for personnel	Rare	Minor	Low	Rare	Minor	Low	Draft handling and transport procedures for mixing tank reagents in the OEMP	Arcadis on behalf of Hi-Quality	
69	[Compartment 2 - WWTP] Mixing Tank (50 KL - Batch)	Compliance / Regs	Incomplete waste treatment	2 sets of each equipment - one for PFAS liquids and one for non-PFAS liquids  Environmental consequences for: Liquid waste: heavy metals, organics PFAS Liquid waste	Malfunction of dosing system  Unknown contaminants  Incorrect generator certificate  Incorrect initial site testing	<b>Safety</b> Damage to downstream equipment  <b>Environment</b> Pollution of soil, groundwater and local waterways	Rare	Slight	Low	Possible	Severe	Medium	Operator training on treatment protocols (OEMP)  Maintenance of pumps	Treated water sampled prior to discharge with any unacceptable liquid wastes recirculated for further treatment  Discharge to sewage is then further treated by an offsite treatment plant before discharge to environment	Rare	Slight	Low	Rare	Minor	Low			Hi-Quality confirmed that all waste must meet tradewaste agreement criteria for discharge
70	[Compartment 2 - WWTP] Clarifier	Toxic fluid	Wastewater spill	Gravity settling 2 sets of each equipment - one for PFAS liquids and one for non-PFAS liquids  Environmental consequences for: Liquid waste: organics PFAS Liquid waste  Similar to holding tank wastewater spill Check personnel placement and leachate system	High inflow	<b>Safety</b> Harm to personnel (saturation with liquid waste)  Compromise of Compartment 1 boundary and contamination of waste piles  <b>Environment</b> Pollution of soil, groundwater and local waterways	Possible	Severe	Medium	Unlikely	Severe	Medium	Dual operation team  All tanks include overflow protection and alarms (OEMP)  Visual inspection during loading / operation  Operator training  Maintenance checks on tank integrity	Bunding of WWTP (OEMP)  OEMP emergency / spill response  Isolation of processing line with valves  PPE for personnel	Rare	Severe	Low	Rare	Severe	Low			
71	[Compartment 2 - WWTP] Clarifier	Toxic solid	Contaminants (solids)	Gravity settling 2 sets of each equipment - one for PFAS liquids and one for non-PFAS liquids	High inflow	<b>Safety</b> Solid particulates carried through system clogging downstream filtration equipment or overflowed onto WWTP floor  Slips / falls	Possible	Minor	Medium	Rare	Slight	Low	Daily decontamination of WWTP floor (OWMP)  Solids management outlined in OWMP	Bunding of WWTP (OEMP)  PPE for personnel	Unlikely	Minor	Low	Rare	Slight	Low			

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
72	[Compartment 2 - WWTP] Sand & Carbon (MMF)	Toxic fluid	Wastewater spill	2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids  Environmental consequences for: Liquid waste: organics PFAS Liquid waste  Similar to holding tank wastewater spill Check personnel placement and leachate system	High inflow Blockage / pressure build-up	<b>Safety</b> Harm to personnel (saturation with liquid waste)  Damage to equipment  Compromise of Compartment 1 boundary and contamination of waste piles  <b>Environment</b> Pollution of soil, groundwater and local waterways	Possible	Severe	Medium	Unlikely	Severe	Medium	Dual operation team  All tanks include overflow protection and alarms (OEMP)  Visual inspection during loading / operation  Operator training  Maintenance checks on tank integrity	Bunding of WWTP (OEMP)  OEMP emergency / spill response  Isolation of processing line with valves  PPE for personnel	Rare	Severe	Low	Rare	Severe	Low			
73	[Compartment 2 - WWTP] Sand & Carbon (MMF)	Toxic solid	Filtration Media Spill	Sand and activated carbon (non-hazardous)  Glass beads instead of sand filters  2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids	High inflow Blockage / pressure build-up  Media Exchange	<b>Safety</b> Harm to personnel	Unlikely	Slight	Low	Rare	Slight	Low	Maintenance checks on piping and process unit integrity  OWMP operating protocols	PPE for personnel	Unlikely	Slight	Low	Rare	Slight	Low	Outline protocol in the OWMP for the exchange of filtration media for MMF process unit	Arcadis on behalf of Hi-Quality	
74	[Compartment 2 - WWTP] Plate Filter Press	Toxic fluid	Wastewater spill	Batch - used for some compartment 1 treatments?  2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids  Environmental consequences for: Liquid waste: organics PFAS Liquid waste  Similar to holding tank wastewater spill Check personnel placement and leachate system	High inflow Poor equipment sealing  System blockage	<b>Environment</b> Release of leachate in solids disposal	Possible	Severe	Medium	Unlikely	Severe	Medium	Dual operation team  All tanks include overflow protection and alarms (OEMP)  Visual inspection during loading / operation  Operator training  Maintenance checks on tank integrity	Bunding of WWTP (OEMP)  OEMP emergency / spill response  Isolation of processing line with valves  PPE for personnel	Rare	Severe	Low	Rare	Severe	Low			Hi-Quality commented that low level quantity of waste in each treatment batch and does not present a safety hazard
75	[Compartment 2 - WWTP] VCZ Mechanical and IE Filtration	Toxic fluid	Wastewater spill	2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids  Environmental consequences for: Liquid waste: organics PFAS Liquid waste  Similar to holding tank wastewater spill Check personnel placement and leachate system	High inflow System blockage / pressure build-up	<b>Safety</b> Harm to personnel (saturation with liquid waste)  Damage to equipment  Compromise of Compartment 1 boundary and contamination of waste piles  <b>Environment</b> Pollution of soil, groundwater and local waterways	Possible	Severe	Medium	Unlikely	Severe	Medium	Dual operation team  All tanks include overflow protection and alarms (OEMP)  Visual inspection during loading / operation  Operator training  Maintenance checks on tank integrity	Bunding of WWTP (OEMP)  OEMP emergency / spill response  Isolation of processing line with valves  PPE for personnel	Rare	Severe	Low	Rare	Severe	Low			
76	[Compartment 2 - WWTP] VCZ Mechanical and IE Filtration	Toxic solid	VCZ Spill	Non-hazardous  2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids	High inflow System blockage / pressure build-up  Media exchange	<b>Safety</b> Harm to personnel	Unlikely	Slight	Low	Rare	Slight	Low	OWMP operating protocols	PPE for personnel	Unlikely	Slight	Low	Rare	Slight	Low	Outline protocol in the OWMP for the exchange of filtration media for VCZ and IE process unit	Arcadis on behalf of Hi-Quality	Hi-Quality confirmed that media is wet from WWTP so inhalation / particulates are not considered

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
77	[Compartment 2 - WWTP] GAC Adsorption Filtration	Toxic fluid	Wastewater spill	2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids  Environmental consequences for: Liquid waste: organics PFAS Liquid waste  Similar to holding tank wastewater spill Check personnel placement and leachate system	High inflow  System blockage / pressure build-up	<b>Safety</b> Harm to personnel (saturation with liquid waste)  Damage to equipment  Compromise of Compartment 1 boundary and contamination of waste piles  <b>Environment</b> Pollution of soil, groundwater and local waterways	Possible	Severe	Medium	Unlikely	Severe	Medium	Dual operation team  All tanks include overflow protection and alarms (OEMP)  Visual inspection during loading / operation  Operator training  Maintenance checks on tank integrity	Bunding of WWTP (OEMP)  OEMP emergency / spill response  Isolation of processing line with valves  PPE for personnel	Rare	Severe	Low	Rare	Severe	Low			
78	[Compartment 2 - WWTP] GAC Adsorption Filtration	Toxic solid	Activated Carbon Spill	Non-hazardous  2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids  Environmental consequences for: Liquid waste: organics PFAS Liquid waste  Similar to holding tank wastewater spill Check personnel placement and leachate system	High inflow  System blockage / pressure build-up  Media exchange	<b>Safety</b> Damage to equipment  <b>Environment</b> Ineffective filtration of incoming liquid waste	Unlikely	Slight	Low	Rare	Slight	Low	OWMP operating protocols	PPE for personnel	Unlikely	Slight	Low	Rare	Slight	Low	Outline protocol in the OWMP for the exchange of filtration media for GAC adsorption filtration process unit	Arcadis on behalf of Hi-Quality	Hi-Quality confirmed that media is wet from WWTP so inhalation / particulates are not considered
79	[Compartment 2 - WWTP] Coconut GAC Adsorption	Toxic fluid	Wastewater spill	2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids  Environmental consequences for: Liquid waste: organics PFAS Liquid waste  Similar to holding tank wastewater spill Check personnel placement and leachate system	High inflow  System blockage / pressure build-up	<b>Safety</b> Harm to personnel (saturation with liquid waste)  Damage to equipment  Compromise of Compartment 1 boundary and contamination of waste piles  <b>Environment</b> Pollution of soil, groundwater and local waterways	Possible	Severe	Medium	Unlikely	Severe	Medium	Dual operation team  All tanks include overflow protection and alarms (OEMP)  Visual inspection during loading / operation  Operator training  Maintenance checks on tank integrity	Bunding of WWTP (OEMP)  OEMP emergency / spill response  Isolation of processing line with valves  PPE for personnel	Rare	Severe	Low	Rare	Severe	Low			
80	[Compartment 2 - WWTP] Coconut GAC Adsorption	Toxic solid	Activated Carbon Spill	Non-hazardous  2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids  Environmental consequences for: Liquid waste: organics PFAS Liquid waste  Similar to holding tank wastewater spill Check personnel placement and leachate system	High inflow  System blockage / pressure build-up	<b>Safety</b> Damage to equipment  <b>Environment</b> Ineffective filtration of incoming liquid waste	Unlikely	Slight	Low	Rare	Slight	Low	OWMP operating protocols	PPE for personnel	Unlikely	Slight	Low	Rare	Slight	Low	Outline protocol in the OWMP for the exchange of filtration media for coconut GAC adsorption filtration process unit	Arcadis on behalf of Hi-Quality	Hi-Quality confirmed that media is wet from WWTP so inhalation / particulates are not considered
81	[Compartment 2 - WWTP] Weak Base Anion Exchange	Toxic fluid	Wastewater spill	2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids  Environmental consequences for: Liquid waste: organics PFAS Liquid waste  Similar to holding tank wastewater spill Check personnel placement and leachate system	High inflow  System blockage / pressure build-up	<b>Safety</b> Harm to personnel (saturation with liquid waste)  Damage to equipment  Compromise of Compartment 1 boundary and contamination of waste piles  <b>Environment</b> Pollution of soil, groundwater and local waterways	Possible	Severe	Medium	Unlikely	Severe	Medium	Dual operation team  All tanks include overflow protection and alarms (OEMP)  Visual inspection during loading / operation  Operator training  Maintenance checks on tank integrity	Bunding of WWTP (OEMP)  OEMP emergency / spill response  Isolation of processing line with valves  PPE for personnel	Rare	Severe	Low	Rare	Severe	Low			

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
82	[Compartment 2 - WWTP] Weak Base Anion Exchange	Toxic solid	Resin spill	Need to further define ion exchange  2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids	High inflow  System blockage / pressure build-up  Media exchange	<b>Environment</b> Ineffective filtration of incoming liquid waste	Unlikely	Slight	Low	Rare	Slight	Low	OWMP operating protocols	PPE for personnel	Unlikely	Slight	Low	Rare	Slight	Low	Outline protocol in the OWMP for the exchange of filtration media for weak base anion exchange process unit  Update weak base anion exchange procedure to include resin type in the OEMP	Arcadis on behalf of Hi-Quality	Hi-Quality confirmed that media is wet from WWTP so inhalation / particulates are not considered  Polymer resin (plastic beads), different affinities for different contaminants
83	[Compartment 2 - WWTP] Kinetic GAC Adsorption	Toxic fluid	Wastewater spill	2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids  Environmental consequences for: Liquid waste, organics PFAS Liquid waste  Similar to holding tank wastewater spill Check personnel placement and leachate system	High inflow  System blockage / pressure build-up	<b>Safety</b> Harm to personnel (saturation with liquid waste)  Damage to equipment  Compromise of Compartment 1 boundary and contamination of waste piles  <b>Environment</b> Pollution of soil, groundwater and local waterways	Possible	Severe	Medium	Unlikely	Severe	Medium	Dual operation team  All tanks include overflow protection and alarms (OEMP)  Visual inspection during loading / operation  Operator training  Maintenance checks on tank integrity	Bunding of WWTP (OEMP)  OEMP emergency / spill response  Isolation of processing line with valves  PPE for personnel	Rare	Severe	Low	Rare	Severe	Low			
84	[Compartment 2 - WWTP] Kinetic GAC Adsorption	Toxic solid	Activated Carbon Spill	2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids	High inflow  System blockage / pressure build-up	<b>Safety</b> Damage to equipment  <b>Environment</b> Ineffective filtration of incoming liquid waste	Unlikely	Slight	Low	Rare	Slight	Low	OWMP operating protocols	PPE for personnel	Unlikely	Slight	Low	Rare	Slight	Low	Outline protocol in the OWMP for the exchange of filtration media for kinetic GAC adsorption process unit	Arcadis on behalf of Hi-Quality	Hi-Quality confirmed that media is wet from WWTP so inhalation / particulates are not considered
85	[Compartment 2 - WWTP] Holding Tank / Trade Waste Discharge	Toxic fluid	Wastewater spill	2 sets of each equipment one for PFAS liquids and one for non-PFAS liquids  Environmental consequences for: Liquid waste, organics PFAS Liquid waste  Similar to holding tank wastewater spill Check personnel placement and leachate system	High inflow  Leak in tank  Human error - release timing	<b>Safety</b> Harm to personnel (saturation with liquid waste)  Damage to equipment  Compromise of Compartment 1 boundary and contamination of waste piles  <b>Environment</b> Pollution of soil, groundwater and local waterways	Possible	Severe	Medium	Unlikely	Severe	Medium	Dual operation team  All tanks include overflow protection and alarms (OEMP)  Visual inspection during loading / operation  Operator training  Maintenance checks on tank integrity	Bunding of WWTP (OEMP)  OEMP emergency / spill response  Isolation of processing line with valves  PPE for personnel	Rare	Severe	Low	Rare	Severe	Low			
86	[Compartment 2 - WWTP] Screw Press	Toxic fluid	Wastewater spill	Used for by-products of wastewater treatment process. Dewatered material either sent for landfill or treated further using bulk soils methodology	High inflow  Poor equipment sealing	<b>Safety</b> Harm to personnel (saturation with liquid waste)  Damage to equipment  Compromise of Compartment 1 boundary and contamination of waste piles  <b>Environment</b> Pollution of soil, groundwater and local waterways	Possible	Minor	Medium	Unlikely	Slight	Low	Dual operation team  All tanks include overflow protection and alarms (OEMP)  Visual inspection during loading / operation  Operator training  Maintenance checks on tank integrity	Bunding of WWTP (OEMP)  OEMP emergency / spill response  Isolation of processing line with valves  PPE for personnel	Rare	Severe	Low	Rare	Severe	Low			

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
87	[Compartment 2 - WWTP] Reagent Storage	Incompatible Mixing	Reagent spills	Reagent storage for excess filter media and other dosing chemicals in use (excl. HCl and caustic soda)  Hazardous: Aluminium sulphate, polymer, ferrous sulphate	Compromise of packaging  Human error / mishandling	Safety Harm to personnel (skin, eye, respiratory)  Unwanted reactions  Corrosion/damage to bunding  Environment Release of undiluted chemicals to soil / groundwater / waterways (danger to aquatic life)	Possible	Severe	Medium	Rare	Severe	Low	OEMP stating segregation according to Australian guidelines	Spill kits  Fire extinguishers  Spill training  Bunding of WWTP  Leachate system  PPE for personnel	Unlikely	Severe	Medium	Rare	Severe	Low			
88	[Compartment 2 - WWTP] Reagent Storage	Toxic fluid	Hydrochloric acid (37 wt.%) spill	Hazardous Corrosive 1, Skin 1, Eye 1, Organ 3	Pump malfunction  Leak from IBC	Safety Harm to personnel  Environment Pollution of soil, groundwater and local waterways	Possible	Severe	Medium	Rare	Minor	Low	Use of relatively dilute acid  OWMP - Mixing protocols / Operator training  Regular maintenance checks on pumps (preventative maintenance to change diaphragms)  Isolation valves on processing lines  Dual operation team  Plant operators carry a two-way radio at all times	Bunding of WWTP  Emergency shower  PPE for personnel	Unlikely	Severe	Medium	Rare	Minor	Low			Hi-Quality and Arcadis confirmed that all transport of liquid waste occurs within the site boundary or the enclosed facility. Hence, any leakage as a result of wear or malfunction of pumps or breach of piping will be contained onsite within the capture range of the leachate system.
89	[Compartment 2 - WWTP] Reagent Storage	Toxic fluid	Caustic soda (30 wt.%) spill	Hazardous Corrosive 1, Skin 1A, Eye 1	Pump malfunction  Leak from IBC	Safety Harm to personnel  Environment Pollution of soil, groundwater and local waterways	Possible	Severe	Medium	Rare	Minor	Low	Use of relatively dilute base  OWMP - Mixing protocols / Operator training  Regular maintenance checks on pumps (preventative maintenance to change diaphragms)  Isolation valves on processing lines  Dual operation team  Plant operators carry a two-way radio at all times	Bunding of WWTP  Emergency shower  PPE for personnel	Unlikely	Severe	Medium	Rare	Minor	Low			Hi-Quality and Arcadis confirmed that all transport of liquid waste occurs within the site boundary or the enclosed facility. Hence, any leakage as a result of wear or malfunction of pumps or breach of piping will be contained onsite within the capture range of the leachate system.
90	[Compartment 2 - WWTP] Filtration Disposal	Toxic solid	Spent filtration media spill	EPA is concerned with the disposal and storage of spent filtration media (specifically GAC and VCZ)	Improper handling - human error  Compromise of IBC tank		Unlikely	Slight	Low	Rare	Slight	Low	Segregation of media in different drums based on treatment stage  Operators forklift certified (enter through truck bay)	Spill kits  PPE for personnel	Rare	Slight	Low	Rare	Slight	Low	Include detailed disposal protocol of spent filtration media in the OEMP	Arcadis on behalf of Hi-Quality	Hi-Quality confirmed the need for testing of filtration media prior to disposal  Storage with other reagents
91	[Compartment 2 - WWTP] General	Natural and Environmental hazards (effect on surroundings)	Natural Events (Flooding)	Closed or open tanks in use?	High rainfall  Compromise of facility roofing	Safety Compromise of reagent packaging leading to exposure of personnel  Environment Pollution of soil, groundwater and local waterways	Rare	Minor	Low	Rare	Minor	Low	Bunding preventing entry of water to WWTP  Reagents stored above flood level  Above ground tanks prevent contamination of flood water	Emergency response (OEMP)  PPE for personnel	Rare	Slight	Low	Rare	Slight	Low			

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
92	[Compartment 3 - Packaged Waste] Bay F (Packaged Waste)	Compliance / Regs	Acceptance of dangerous goods waste	Packaged waste received of a different dangerous goods class (e.g., Class 3, 5, 6.1)	Unintended contamination Mislabelled waste drums	<b>Safety</b> Harm to personnel (flammable materials, toxic odours) <b>Environment</b> Pollution of air quality Leak of liquid wastes beyond site boundary and contamination of local waterways / entry into storm water system	Probable	Severe	Medium	Possible	Severe	Medium	Chemical analysis or an SDS for each packaged waste batch Non-conforming protocols		Rare	Severe	Low	Rare	Severe	Low	Adapt isolation protocol from Yatala for dangerous packaged waste received onsite. This includes storage and onsite testing of dangerous waste materials to confirm against received SDS / chemical analysis	Arcadis on behalf of Hi-Quality	Hi-Quality confirmed that the procedure at Yatala - testing upon receipt to immediately determine if suitable for onsite storage  Hi-Quality commented that a degree of knowledge on the waste generator / waste material is required - is hazardous waste expected from this supplier, what physical / chemical qualities are expected for this waste type? A rejected waste register is also maintained to ensure the conformity of all suppliers
93	[Compartment 3 - Packaged Waste] Bay F (Packaged Waste)	Open Flame	Fire / Ignition		Human error in vehicle handling External ignition from laboratory or office	<b>Safety</b> Harm to personnel (inhalation) Release of toxic fumes (Escalated: Explosion) <b>Environment</b> Pollution of local air quality and potential odour spreading to nearby residential, commercial, and recreational facilities	Unlikely	Severe	Medium	Unlikely	Minor	Low	Fire walls Hot works protocol Staff inductions / training	Fogging suppression system (70%) HVAC / Scrubber system Fire hose reel, extinguisher (OEMP) Emergency response plan PPE for personnel	Rare	Severe	Low	Rare	Minor	Low	Confirm inclusion of fogging suppression system in the fire management plan	Arcadis on behalf of Hi-Quality	It was noted that industry incidents have been associated with flammable materials (hand sanitisers)
94	[Compartment 3 - Packaged Waste] Bay F (Packaged Waste)	Natural and Environmental hazards (effect on surroundings)	Natural Events (Flooding)	EPA specifically enquires as to storage of hazardous packaged waste	High rainfall Compromise of facility roofing	<b>Safety</b> Unwanted reactions <b>Environment</b> Cross-contamination of waste batches Loss of containment through compromise of packaging Pollution of soil, groundwater and local waterways	Rare	Minor	Low	Rare	Minor	Low	Hazardous waste stored in line with Australian guidelines Stored above flood level (1 in 500 years)		Rare	Minor	Low	Rare	Minor	Low			
95	[Compartment 3 - Packaged Waste] Bay F (Recovered Recyclables)	Incompatible Mixing	Contaminants		Carry over contaminants from soil batches	<b>Safety</b> Harm to personnel (arsenic timber) Unwanted reaction <b>Environment</b> Release of contaminants to landfill for disposal	Unlikely	Minor	Low	Rare	Slight	Low	OEMP treatment protocols (physical screening) Storage limit of 35 tonnes before removal (in line with fire safety guidelines) Sampling of recovered material for contaminants (case-by-case basis)	PPE for personnel	Rare	Minor	Low	Rare	Slight	Low			Hi-Quality commented arsenic levels already lower than landfill limits for timber

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
96	[Compartment 3 - Packaged Waste] Bay F (Recovered Recyclables)	Open Flame	Fire / Ignition	Wood from physical separation of soils	Heavy machinery External ignition sources (office / laboratory)	<b>Safety</b> Harm to personnel Spread and ignition of flammable waste (Escalated: Explosion)  <b>Environment</b> Pollution of local air quality spreading to nearby residential, commercial, and recreational facilities	Possible	Severe	Medium	Possible	Minor	Medium	Storage limit of 35 tonnes before removal (in line with fire safety guidelines) OEMP fire safety protocol Fire walls	Fogging suppression system (70%) Enclosed / negative pressure of treatment facility (limits exposure) Push walls minimum 1 m above stockpile height HVAC / Scrubber system Fire hose reel, extinguisher (OEMP) Emergency response plan PPE for personnel	Unlikely	Severe	Medium	Rare	Minor	Low			
97	[Compartment 3 - Packaged Waste] Shredder	Open Flame	Fire / Ignition		Mechanical action of shredding Malfunction of equipment Failure of nearby heavy vehicles Shredding of incorrect waste type	<b>Safety</b> Harm to personnel (inhalation, burns)  <b>Environment</b> Spreading to packaged waste and stored waste in compartment 1 resulting in ignition, release of toxic fumes (Escalated: Explosion), pollution of local air quality (high PM) spreading to nearby residential, commercial, and recreational facilities	Possible	Severe	Medium	Possible	Minor	Medium	Storage limit of 35 tonnes before removal (in line with fire safety guidelines) OEMP fire safety protocol Fire walls Dual operation Automatic shutdown interlocks / emergency stops Thermal overloads for shredder	Fogging suppression system (70%) Enclosed / negative pressure of treatment facility (limits exposure) HVAC / Scrubber system Fire hose reel, extinguisher (OEMP) Emergency response plan PPE for personnel	Rare	Severe	Low	Rare	Minor	Low			
98	[Compartment 3 - Packaged Waste] Shredder	Dynamic situation hazards	Projectiles		Improper loading / overloading of shredder Human error	<b>Safety</b> Harm to personnel (injury, released waste exposure) Damage to heavy machinery  <b>Environment</b> Striking / damaging of packaged waste containers leading to loss of containment (solid / liquid waste) and release of untreated waste to stormwater system	Possible	Major	Medium	Rare	Slight	Low	Dual operation Operator training to prevent overloading Safe operating distance	PPE for personnel	Unlikely	Major	Medium	Rare	Slight	Low	Confirm if shredder covering has an interlock preventing operation of shredder while open	Hi-Quality	Discussion with Hi-Quality regarding potential fatalities at this site and existing facilities ( <a href="https://www.owhsp.qld.gov.au/court-report/waste-resource-company-fined-140000-after-worker-fatality">https://www.owhsp.qld.gov.au/court-report/waste-resource-company-fined-140000-after-worker-fatality</a> ). Hi-Quality felt the incident was not comparable to the proposed facility at Prestons.
99	[Compartment 3 - Packaged Waste] Shredder	Asphyxiates	Airborne particulate release	EPA requests environmental controls	Shredding of packaged materials	<b>Safety</b> Harm to personnel (inhalation) Cross-contamination of packaged waste	Possible	Minor	Medium	Possible	Slight	Low	Material choice for shredding doesn't form particulates Cross checking of materials before shredding activity Operator training (OEMP) - procedures, SOPs, training	Enclosed / negative pressure of treatment facility (limits exposure) HVAC / Scrubber system PPE for personnel	Rare	Minor	Low	Rare	Slight	Low			

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
100	[Compartment 3 - Packaged Waste] Heavy Equipment	Incompatible Mixing	Cross-Contamination	Loaders and seives used for a number of different operations Similar to immobilisation mixing of waste	Improper decontamination between uses	<b>Safety</b> Impact to effectiveness of waste treatment procedures Corrosion of equipment Unwanted reactions	Possible	Slight	Low	Unlikely	Minor	Low	Types of soil waste (non-hazardous and similar contaminant compositions) Decontamination procedure Individual treatment of batches (treatment / storage) OWMP - management requirements Overseen by supervisor (visual inspection)	Testing post-treatment to verify conformity to waste regulations, if unacceptable further treatment is performed	Unlikely	Slight	Low	Rare	Slight	Low			
101	[Compartment 3 - Packaged Waste] Heavy Equipment	Dynamic situation hazards	Loss of control of machinery / mobile plant	Occurrences during treatment within compartment 1 EPA also noted this point	Human Error Equipment Malfunction	<b>Safety</b> Harm to personnel Falling of vehicle into treatment pits Cross-contamination of waste loads Loss of containment for current treatment load Damage to plant bunding	Possible	Severe	Medium	Rare	Slight	Low	Training protocols for machinery operation (OEMP) Swept path analysis to determine manoeuvrability of heavy machinery (Proposal description) All operators carry two-way radios Supervisors Equipment maintenance program	Bunding of compartment 3 PPE for personnel	Unlikely	Severe	Medium	Rare	Slight	Low			Hi-Quality commented that collision is more of a risk than spilling of waste.
102	[Compartment 3 - Packaged Waste] Cement Silo	Toxic solid	Cementitious spill	EPA specifically requests consideration of the stored cement on site and environmental controls List of hazardous materials present OCP, GGBFS (carcinogenic), PFA (carcinogenic, danger to aquatic life), CKD Lime, Sodium silicate, organophilic clay, pozzolans (carcinogenic), bentonite	Human error - collision of heavy vehicle Overflow / inaccurate filling of storage container	<b>Safety</b> Harm to personnel (inhalation) Contamination of packaged waste <b>Environment</b> Release of cementitious particulates to surrounding area	Possible	Severe	Medium	Rare	Slight	Low	Bulk container transport when moving	Enclosed / negative pressure of treatment facility (limits exposure) HVAC / Scrubber system OEMP spill response PPE for personnel	Unlikely	Minor	Low	Rare	Slight	Low			
103	[Mechanical Room / HVAC System]	Toxic gas	Excess discharge / high velocity rates	OEMP Section 2.9	Malfunction of HVAC system (electrical, maintenance) Damage due to road impact	<b>Safety</b> Build up of particulates and fumes presenting a potential for harm to personnel in the warehouse Harm to the nearby community <b>Environment</b> Further spread of particulate matter, fumes/vapors, odorous cloud to nearby residential, commercial, and recreational sites	Possible	Severe	Medium	Possible	Severe	Medium	Area is protected within light vehicle carpark Bollards in front of HVAC room Protocol to stop site operation (any odour or gas generating activity) if HVAC / Scrubber is compromised Monthly exchange of filters (1 - 2 hrs to exchange)	Self-contained warehouse for fumes / pollutants / particulates Air quality management plan PPE for personnel	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Confirm that stop operation protocol is included in the emergency response as outlined in the OEMP. Revise Air Quality Impact Assessment (AQIA) to provide clarification regarding the ventilation system design and assessment of ventilation flowrates and discharge velocities.	Arcadis on behalf of Hi-Quality	Hi-Quality acknowledged that this is an acceptable risk to warehouse personnel given the current waste piles still need to be maintained even when the acceptance of new waste has been halted.

RISK REGISTER

ID	Plant Area / Activity / Process Unit	ISO17776 Guideword (Prompt)	Event (Hazard)	Comments / Notes (Background Information / Regulator / Sherpa)	Cause	Consequence (Direct and Escalated)	L (Saf - UM)	C (Saf - UM)	RR (Saf - UM)	L (Env - UM)	C (Env - UM)	R (Env - UM)	Preventative Controls (Minimize potential loss of containment / impact)	Detection / Mitigation Controls (Maximize recovery from loss of containment / impact)	L (Saf)	C (Saf)	RR (Saf)	L (Env)	C (Env)	RR (Env)	Control Option/Action	Action Owner	Comments
104	[Mechanical Room / HVAC System]	Asphyxiates	Discharge of pollutant particulates / polluting fumes	EPA notes arsenic and chromium specifically	Filter failure with HVAC system Malfunction of HVAC system	<b>Safety</b> Build up of particulates and fumes presenting a potential for harm to personnel in the warehouse  Harm to the nearby community  <b>Environment</b> Pollution of local air quality spreading to nearby residential, commercial, and recreational facilities	Probable	Minor	Medium	Possible	Severe	Medium	Testing by independent consultants (3 months) to ensure conformity with EPL  Protocol to stop site operation (any odour or gas generating activity) if HVAC / Scrubber is compromised  Monthly exchange of filters (1 - 2 hrs to exchange)	Self-contained warehouse for fumes / pollutants / particulates  Air quality management plan  PPE for personnel	Unlikely	Minor	Low	Unlikely	Severe	Medium	Confirm that stop operation protocol is included in the emergency response as outlined in the OEMP.  Revise Air Quality Impact Assessment (AQIA) to provide clarification regarding the ventilation system design and assessment of ventilation flowrates and discharge velocities.	Arcadis on behalf of Hi-Quality	Hi-Quality commented on the presence of arsenic and chromium as minor contaminants within the soils for immobilisation.
105	[Office]	Open Flame	Fire / Ignition		Improper use of workplace appliances Contraband personal items	<b>Safety</b> Harm to personnel (burns, inhalation)  <b>Environment</b> Spread and ignition of waste, pollution of local air quality spreading to nearby residential, commercial, and recreational facilities	Unlikely	Severe	Medium	Unlikely	Minor	Low	On-site protocols for unacceptable personal items  Fire walls  Operator / personnel training	Enclosed / negative pressure of treatment facility (limits exposure)  HVAC / Scrubber system  Fire walls  Fire hydrants  Fire response plan  Office protocols / fire wardens  PPE for personnel	Unlikely	Severe	Medium	Unlikely	Minor	Low			Hi-Quality confirmed that only non-flammable materials are to be stored onsite reducing the severity of any fires, however, the inherent risk of a fire is still acknowledged.
106	[Laboratory]	Compliance / Regs	False test results		Cross-contamination of laboratory equipment Sample non-representative of bulk waste batch Improper technique	<b>Safety</b> Distruption to waste treatment schedule (build-up in facility)  <b>Environment</b> Incorrect treatment protocol, unwanted reactions, discharge of untreated waste (offsite or tradewaste)  Pollution of drainage system and waterways	Possible	Minor	Medium	Rare	Minor	Low	Scheduled waste delivery of known batches  Australian standards for testing protocols / waste verification  Lab technician training  Fume hood  Two qualified personnel on site (one actively working)  Verification / validation against incoming certificates / chemical analysis	Spill kits  Fire extinguishers  Emergency response plan (OEMP)  PPE for personnel	Rare	Minor	Low	Rare	Minor	Low	Update standards for laboratory testing in the OEMP based on EPL (once license received)	Arcadis on behalf of Hi-Quality	