Karratha Hazardous Waste and Decontamination Facility

Cleanaway Co Pty Ltd

Part V *Environmental Protection Act 1986* – Works Approval Application Supporting Document

JBS&G 68026 | 165,881 (Rev 0)

19 March 2025

We acknowledge the Traditional Custodians of Country throughout Australia and their connections to land, sea and community.

We pay respect to Elders past and present and in the spirit of reconciliation, we commit to working together for our shared future.

Caring for Country The Journey of JBS&G
Artist: Patrick Caruso, Eastern Arrernte

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Abbreviations

Term	Definition
ACN	Australian Company Number
AEP	Annual Exceedance Probability
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
CAW	Crown Allocation Well (related to groundwater abstraction)
CVAA	Cold Vapor Atomic Absorption (analytical method for mercury)
DER	Department of Environment Regulation (former name of DWER)
DG	Dangerous Goods
DWER	Department of Water and Environmental Regulation
EP Act	*Environmental Protection Act 1986*
HDPE	High-Density Polyethylene
HCl	Hydrochloric Acid
H_2O_2	Hydrogen Peroxide
Hg	Mercury
IBC	Intermediate Bulk Container
ICP-MS	Inductively Coupled Plasma Mass Spectrometry (analytical method)
ISO	International Organization for Standardization
kL	Kiloliters
L8332/2009/3	Licence number for the premises
mg/kg	Milligrams per kilogram (unit of concentration)
NORM	Naturally Occurring Radioactive Material
PFAS	Per- and Polyfluoroalkyl Substances
PVC	Polyvinyl Chloride
RSMP	Radiation Safety Management Plan
RSWA	*Radiation Safety Act of Western Australia 1975*
TEC/PEC	Threatened and Priority Ecological Communities
UNEP	United Nations Environment Programme
µSv/h	Microsieverts per hour (radiation dose rate)
$\mu g/m^3$	Micrograms per cubic meter (air concentration)

1. Introduction

1.1 Background

Cleanaway Co Pty Ltd (Cleanaway) operates the Karratha Hazardous Waste and Decontamination Facility (previously Karratha Liquid Waste Treatment and Waste Transfer Station) (the premises). The premises serves as a liquid and solid waste storage and treatment facility. Waste is stored and processed before being sent off-site to alternative authorised premises or directed, as treated liquid waste, to lined evaporation ponds on-site.

Cleanaway holds Licence L8332/2009/3 for the premises issued by the Department of Water and Environmental Regulation (DWER) under Part V of the *Environmental Protection Act 1986* (EP Act). In May 2017, Cleanaway received approval from DWER through an amendment to the licence for the acceptance and storage of infrastructure associated with the offshore oil and gas industry contaminated with naturally occurring radioactive material (NORM). In December 2020, the Radiation Council of Western Australia (RCWA) approved the decontamination of NORM surface contaminated objects at the premises under the *Radiation Safety Act 1975* (registration reference RS5/2020/31906). Subsequently, in May 2022, Cleanaway was granted a further licence amendment to authorise the decontamination of NORM surface contaminated objects to align with the RCWA approval.

Cleanaway is seeking approval to expand the decontamination activities to include other contaminants present in decommissioned items from various industries, including the offshore oil and gas industry. The additional activities involve new equipment that will be used in the existing decontamination area, and the resulting contamination will be processed through existing infrastructure and equipment at the premises, e.g., wastewater treatment plant, ponds and storage areas.

In addition, Cleanaway is requesting approval to install dewatering equipment, including centrifuge, at the premises to dewater sludges (predominantly hydrocarbon-contaminated sludge) such that the liquid and solid components can be separated and treated, including using bioremediation, or removed from the premises.

1.2 Purpose and scope

This document together with the completed DWER application form constitutes an application for a works approval under Part V of the EP Act. Table 1.2 provides an overview of the application form supporting attachments and the relevant sections of this document that address each item.

Table 1.1: Application attachments

Application Form attachments	Attached
Attachment 1A: Proof of occupier status	N/A
Attachment 1B: ASIC company extract	N/A
Attachment 1C: Authorisation to act as a representative of the occupier	N/A
Attachment 2: Premises map/s	Yes
Attachment 3A: Environmental commissioning plan	N/A
Attachment 3B: Proposed activities	Section 2
Attachment 3C: Map of area proposed to be cleared (only applicable if clearing is proposed)	N/A
Attachment 3D: Additional information for clearing assessment	N/A
Attachment 4: Marine surveys (only applicable if marine surveys included in application)	N/A
Attachment 5: Other approvals and consultation documentation	N/A
Attachment 6A: Emissions and discharges	Section 3
Attachment 6B: Waste acceptance	Section 2.2

Application Form attachments	Attached
Attachment 7: Siting and location	Section 4
Attachment 8: Additional information submitted	Yes
Attachment 8A: Material safety data sheets *Attachment 8B: Premises layout plan* *Attachment 8C: Decontamination zones general layout plans* *Attachment 8D: Bund capacity assessment (decontamination)* *Attachment 8E: Centrate tank example specification* *Attachment 8F: Bund capacity assessment (dewatering)*	
Attachment 9: Category-specific checklist(s)	N/A
Attachment 10: Proposed fee calculation	Yes
Attachment 11: Request for exemption from publication	N/A

The scope of the works approval application is to:

- Seek changes to the prescribed premises categories and assessed production capacity of the premises (section 1.3);
- Install and operate additional infrastructure and equipment for the purposes of decontaminating (chemical cleaning) items contaminated with mercury and NORM (section 2.1); and
- Install and operate additional infrastructure and equipment for dewatering and treating contaminated soils and sludges (section 2.4).

1.3 Prescribed premises categories and activities summary

Cleanaway is proposing to amend the prescribed premises categories and assessed production capacity of the premises to facilitate the proposed changes in decommissioning activities. This includes an increase in the assessed production capacity for category 61A (solid waste facility) and addition of category 47 to include scrap metal activities associated with processing items once decontaminated (Table 1.2).

Table 1.2: Prescribed premises categories

Prescribed premises category	Existing production/ design capacity	Proposed production capacity	Summary of activity as relevant to this application
Existing activities			
Category 61 Liquid waste facility	40,000 tonnes per annual period	40,000 tonnes per annual period	Treatment of wastewater from decontamination activities
Category 61A Solid waste premises	40,000 tonnes per annual period	80,000 tonnes per annual period	Decontamination of items contaminated with NORM and mercury.
Additional activities			
Category 47: Scrap metal recovery	N/A	40,000 tonnes per annual period	Breakdown of decontaminated and clean items

1.4 Applicant details

The applicant's details are shown in Table 1.3 and the ASIC company extract is contained in Attachment 1B.

Table 1.3: Application details

Detail	Response
Applicant name:	Cleanaway Co Pty Ltd
Trading as:	Cleanaway
ACN:	127 853 561
Registered business address:	Level 4, 441 St Kilda Road MELBOURNE VIC 3004
Authorised representative:	[redacted]

1.5 Premises details

The premises is located on Lot 126 Warlu Road, Cooya Pooya WA 6714 (Title LR3053/216). The premises details are summarised in Table 1.4 below, and the location is shown on the Premises Map in Attachment 2A (from Licence L8332/2009/3).

Table 1.4: Premises details

Aspect	Details
Premises name:	Karratha Hazardous Waste and Decontamination Facility
Site description:	Lot 126 on Plan 183297
Site address:	Lot 126 Warlu Road, Cooya Pooya WA 6714
Occupier status:	Lease holder
Local Government Authority area:	City of Karratha

2. Proposed activities

2.1 Construction activities

The works will involve limited construction works within the existing established yard and building. This will include installation of a gantry crane in the building and placement and connection of tanks, containers, pumps and water treatment equipment.

2.2 Commissioning activities

Commissioning activities will be limited to testing of the decontamination and water treatment equipment with clean water and integrity/capacity testing of tanks and bunds.

2.3 Time Limited Operation - Decontamination activities

Items associated with certain industrial processes have the potential to be contaminated with material that can accumulate within them as a hard scale or absorb/chem-absorb within the structure. Of these, mercury and NORM have the greatest potential to result in an item being classified as contaminated.

2.3.1 Mercury decontamination

Mercury scale is formed over several steps:

1. Oxidation of iron (Fe) to iron oxide (FeO_2).

2. Formation of iron disulphide (FeS_2) in the presence of hydrogen sulphide (H_2S).
3. Reaction of iron disulphide with elemental mercury (Hg^0), forming mercury sulphide (HgS) and iron sulphide (FeS).

Note: not all elemental mercury is converted to mercury sulphide, and mercury vapours can still be emitted from the items at their end of life.

To enable efficient mercury decontamination, an initial hydrophobic material decontamination/degreasing step may be required. This is typically undertaken with an alkaline degreasing step using sodium hydroxide (NaOH), trisodium phosphate (Na_3PO_4), sodium metasilicate (Na_2SiO_3) and a surfactant (e.g., TERGITOL NP-10 or similar). These degreasers do not contain volatile organic compounds (VOCs) or solvents and, as such, will not increase the potential for mercury vapour generation. The surfactant acts as a vapour mitigant and, therefore, the risk of mercury vapour generation during this step will is unlikely.

The scale removal process is based on submersing the items in chemical baths, which dissolves the steel-scale interface and liberates the scale. Elemental mercury (Hg^0) is converted to mercurous sulphate in the process so that it does not re-absorb. The dislodged scale and metallic ions are then removed via flushing, washing or jetting.

The chemicals used in the decontamination process are low-strength acids, typically sulfuric acid (H_2SO_4) used at concentrations less than 15% by weight. Oxidisers are introduced via bubble aeration or low strength chemical oxidants (<1%).

Material safety data sheets for chemicals used in the decontamination process are contained in Attachment 8A.

The decontamination baths contain an aqueous mixture of sulfuric acid enhanced with hydrogen peroxide (H_2O_2). Mercury has a high affinity to sulfuric acid and reacts with it to form mercuric sulfate ($HgSO_4$), as follows:

$$Hg^0 + 2H_2SO_4 \rightarrow HgSO_4 + SO_2 + 2H_2O$$

The mercuric sulfate decomposes in water to form insoluble mercuric subsulfate and sulfuric acid meaning the process regenerates the acid as it consumes it.

Hydrochloric acid may be added the baths to enhance the corrosiveness of the chemicals on steel items, and hydrogen peroxide is used to oxidise any organic matter on the surface of the item and improve the hydrophilic properties of the metal surface.

The hydrogen peroxide is consumed during the cleaning process and needs to be periodically replenished. The consumption of hydrogen peroxide is reduced by whitewater (micro-bubbles) generated using aerators fed by a centrifugal pump.

At the low concentrations of acid used, the reaction rates are slow, and mercury emissions are mitigated to low levels (i.e., <0.00 µg/m^3) believed to be due to the density of mercury inhibiting its migration to the surface, allowing for sufficient time for the chemical reaction to occur to form non-volatile mercury sulphate or mercury subsulfate.

2.3.2 Naturally occurring radioactive material

NORM contamination is typically in the form of an insoluble barite and/or celestine scale on the process piping, which can be removed through the same action described in section 2.3.1 or via the use of chelating agents that dissolve the corrosion formation layer in the first few millimetres of the scale, resulting in the scale layer being dislodged. The dislodged scale and metallic ions are then removed via flushing, washing or jetting, or via air displacement or ultrasonic cleaning methods.

Like mercury removal process, a degreasing step may also be required, using the same chemicals as described in section 2.3.1.

The removal of the NORM via chelating agents involves the use of potassium carbonate (K_2CO_3) and EDTA (ethylenediaminetetraacetic) acid to create an acidic mix, and a surfactant (TERGITOL NP-10) at between 70 and 80 degrees Celsius. Wastewater filters to <1 µm remove the dislodged scale. Once complete, the acid solution is neutralized with NaOH.

In accordance with the existing RCWA approval and the approved Radiation Safety Management Plan (RSMP) for the premises, Cleanaway currently carries out decontamination of NORM contaminated items, which includes:

- The washing, including high pressure water jetting, of NORM contaminated material and treatment of wash waters; and
- The containment and storage of NORM, including adding reagents to solidify wastes.

2.3.3 Infrastructure and equipment

Table 2.1 provides the list of infrastructure and equipment within the boundary of the premises relevant to the additional decontamination activities. The location of the decontamination zones is shown on the Premises Layout Plan in Attachment 8B and the layout of the infrastructure and equipment is shown on the general arrangement drawings in Attachment 8C.

Table 2.1: Infrastructure and equipment (decontamination zone)

Infrastructure and equipment	Specification	Location as shown in Attachment 8C
Decon Zones 1 & 2	• Impervious concrete floor with blind concrete sumps for the recovery of wash waters (one sump each zone). • Fitted with infrastructure to contain overspray.	Decontamination Zones and Decon Zones 1 & 2 on Premises Layout Plan in Attachment 8B
Large mobile chemical bath	• Located in Decon Zones 1 & 2. • Steel container (approximately 13 m x 2.5 m). • Maximum capacity 57.10 kL. • Includes air diffusion system for mixing.	6
Small mobile chemical bath	• Located in Decon Zones 1 & 2. • Steel container (approximately 5 m x 2.5 m). • Maximum capacity 21.96 kL. • Includes air diffusion system for mixing.	7
Chemical circulation area	• Located in Decon Zones 1 & 2. • Portable collapsible bund.	4
Large mobile wash bay	• Located in Decon Zones 1 & 2. • Steel container (approximately 13 m x 2.5 m).	5
Dangerous goods container	• Located in Decon Zones 1 & 2. • Steel container (approximately 13 m x 2.5 m) with bunded floor.	1
Filtration and pump skid	• Located in Decon Zones 1 & 2. • Maintained in good working order.	2
Wastewater skid	• Located in Decon Zones 1 & 2. • Maintained in good working order. • Wash waters directed through a settlement, decanting and/or filtration system and down 1 micron or equivalent filters prior to processing as industrial wastewater at the premises. • Wash waters tested and verified as per site licence to be free of NORM material before processing as an industrial wash water.	3

There are no specific construction or environmental commissioning activities associated with the proposed activities. The required infrastructure and equipment for the proposed activities is mobile and will be installed in the existing area and shed currently used for NORM decontamination.

2.3.4 Waste acceptance

The items accepted for decontamination will initially be from the decommissioning of offshore oil and gas facilities and include flexible flowlines and risers, drilling and process piping, production tubing, subsea trees and caissons. The items will be accepted in a series of 'packages' comprising several components, which will be delivered to the premises by truck.

Contaminated items accepted at the site will be sealed (e.g., open ends of pipes and structures closed-up) or stored in sealed containers, thus preventing the escape of contamination to the environment. Any items not sealed or in sealed containers will be stored in bunded concrete hardstand areas. The stored items will be assessed by a trained technician to determine the type of contamination present and, therefore, the appropriate decontamination technique.

Items potentially contaminated with NORM will be accepted in line with the requirements of the existing *Radiation Safety Act 1975* registration (RS5/2020/31906) and Code for the Safe Transport of Radioactive Material (Australian Radiation Protection and Nuclear Safety Agency, 2019) in accordance with condition 1 (table 1) of the licence.

A summary of the waste acceptance relevant to this application is provided in Table 2.2.

Table 2.2: Waste types accepted for decommissioning

Waste types	Quantity	Waste activity infrastructure	Monitoring	Location on Premises Layout Plan (Attachment 8B)
Contaminated infrastructure	Approximately 40,000 tonnes	Decontamination and dismantling	• Each load arriving at the premises (tonnes or m^3). • Each load leaving or rejected from the premises (tonnes or m^3). • Assessed for contamination prior to treatment.	Decontamination Zones

2.3.5 Decontamination operations

The two decontamination zones (Decon Zones 1 & 2 on Premises Layout Plan in Attachment 8B) are in an existing covered workshop area (approximately 20 m x 20 m) with a bunded concrete and graded floor draining to a drain-pit. The bund is approximately 200 mm high providing a containment capacity of approximately 80 kL. A bund capacity assessment has confirmed that the bunded area is sufficient to contain a major spill of contaminated water (i.e., 110% of the capacity of the large chemical bath) (refer to Attachment 8D).

Contaminated items will be placed in the either the small or large mobile chemical bath using a mobile or overhead crane where the scale will be subject to the chemical and physical (i.e., aeration) processes to dislodge and dissolve the scale.

Larger items that cannot fit in the baths will be treated in the chemical circulation area where they will be connected to a closed-loop system and flushed with chemicals using the pump and filtration skid.

Once an item is removed from the bath or chemical circulation area after sufficient treatment time, it will be rinsed in the large mobile wash bay or existing bunded water pressure cleaning bay.

Wash water will be collected and processed via a wastewater skid, which will employ a neutralisation and precipitation as the main treatment method. The neutralisation and precipitation results in a filterable calcium compound, which is removed in a filtration skid. The separated solids will be drummed, packed and stored in

the existing NORMS Shed Storage and NORMS Storage Compound (Attachment 8B) prior to disposal off-site. The treated water is reused in the decontamination process or disposed via the existing on-site evaporation ponds.

Once decontaminated, the items will be moved to the external area of the decontamination zones where they will be broken down into smaller pieces using various methods, including but not limited to: grinder, air gouging, cold cutting, shears, waterjet cutting, plasma cutting and oxy cutting. The clean material will then be stored pending removal from the premises for recycling.

When not in use, the chemicals will be pumped from the baths using the pump and filtration skid into intermediate bulk containers (IBCs) and stored in the dangerous goods container.

2.3.6 Monitoring, record keeping and reporting

Once items have been decontaminated, they will be inspected and surveyed for any residual contamination. Items will be considered adequately decontaminated and suitable for further processing if contamination is below the clearance criteria as outlined in Table 2.3. Note: measurement of NORM contamination will be conducted in accordance with the existing RSMP (Registration RS5/2020/31906 under the *Radiation Safety Act 1975*) and current licence.

Regarding mercury, Australia is a signatory to the Minamata convention where the mercury threshold has been established in *UNEP/MC/COP.5/9 - Establishment of mercury waste thresholds (article 11)* as either 10, 15 or 25 mg/kg, with the median of delegates, including Australia, choosing 15 mg/kg. Therefore, this is proposed as the clearance criteria for the premises.

To enable this assessment, a coupon will be removed via a cold cut method from the object, the scale completely dissolved using a laboratory digestion technique such as Aqua Regia or similar, and assessed via VAPOR ATOMIC ABSORPTION (CVAA) (USEPA/SW-846 Methods 7000A/7470A/7471A/7471B) or via ICP-MS. Portable XRF testing will only be used as an in-field tool to inform measurement, testing and validation

Table 2.3: Decontamination acceptance criteria and testing methods

Location	Parameter	Unit	Method	Clearance level
Decontaminated items	NORM Surface Contamination	Bq/cm^2	Contamination meter	< 0.2 above background
	NORM Surface Gamma Dose Rate	µSv/h	Gamma survey meter	< 2 x background
	Elemental mercury (liquid)	N/A	Visual	N/A
	Mercury in scale and surface-bound mercury	mg/kg	pXRF surface measurement	< 15

2.4 Time Limited Operation – Dewatering activities

Cleanaway regularly receives and processes hydrocarbon contaminated wastes such as oily sludge and oil based drill muds at the premises and has identified the need for dewatering equipment such as decanting centrifuges (three or two phase) and/or filter press to recover oil and solids from these wastes to allow for more sustainable processing and reduce the volume of waste sent to landfill via fixation. The dewatering process will be as follows:

1. Homogenise, liquid, soil and oil via a mixing tank for efficient operation and send to the decanter (note: in some cases, it may be more advantageous to remove a floating layer from settled containers such as ISOtainers).
2. Dewatering of sludge.

3. Treatment of solids (e.g., bioremediation) and disposal off-site.
4. Treatment of separated water and oils.

2.4.1 Infrastructure and equipment

Table 2.1 provides the list of infrastructure and equipment within the boundary of the premises relevant to the dewatering activities.

Table 2.4: Infrastructure and equipment (centrifuge)

Infrastructure and equipment	Specification	Location as shown on Premises Layout Plan in Attachment 8B
Centrifuge	Located on bunded concrete pad	Decanting Centrifuge
Mix tank	20-30 m^3 capacity steel tank located on bunded concrete pad	
Centrate tank	20-32 m^3 capacity steel tank located on bunded concrete pad	
Oil/Hydrocarbon Tank	20-32 m^3 capacity steel tank located on bunded concrete pad	
Bioremediation pads	Nominal 35 m x 35 m bunded pad.	Bio Remediation Pad 1 and Bio Remediation Pad 2

The location of the dewatering area is shown on the Premises Layout Plan in Attachment 8B and an indicative specification of the centrate tank is provided in Attachment 8E (note: the mix tank will be a similar specification with different internal elements, i.e., agitators instead of settling weirs).

2.4.2 Dewatering operations

The sludge will first be pumped to the mix tank where agitators will homogenise the material before it is discharged to the decanting centrifuge. The decanting centrifuge receives slurry through a feed tube at the pulley end (solids discharge) of the machine. The slurry is dispersed into the rotating bowl, where centrifugal force produced by the high-speed rotation of a cylindrical bowl separates liquid from the solids and, in the case of a three phase decanter, weir plates separate the water from the oil based on density. The performance of the centrifuge is based on three variable factors which can be controlled to alter the liquid and solids discharge parameters:

- Force exerted on the fluid – centrifugal force pulling fluid against the outside wall of the centrifuge;
- Retention time in the centrifuge – the longer the slurry remains in the centrifuge the smaller the particle that can be separated; and
- Differential speed of conveyor – the faster the conveyor rotates the wetter the solids.

A typical centrifuge and operation are shown in Figure 2.1.

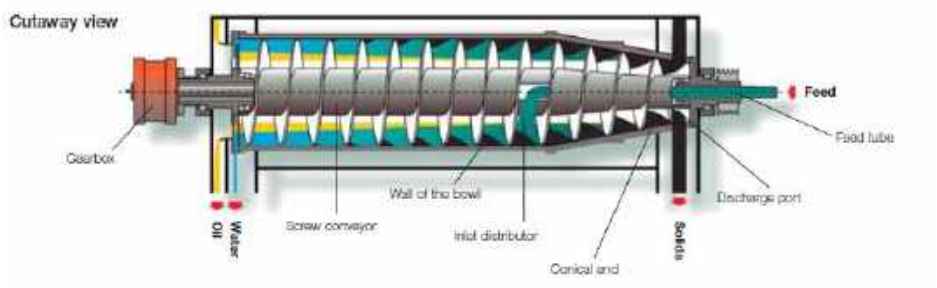

Figure 2.1: Typical three phase centrifuge

Liquid (water and oil) flows out the liquid discharge end of the machine and solids are conveyed to the solids discharge point located at the pulley end of the machine whey they fall into a chute at the bottom of the machine. The solids will be stored in the existing drying pad or new bioremediation pads (refer to Attachment 8B).

The separated liquids and oils will be further processed for the purposed as required . The water phase will be transferred to the existing tank farm or evaporation ponds and the settled solids will be periodically cleaned out and re-treated through the dewatering process, the oil phase being removed offsite to recycled oil processing facilities

The dewatering process will take place on an existing bunded concrete pad with sufficient capacity to contain 110% of the largest container in the bund (refer to bund capacity assessment in Attachment 8F).

2.4.3 Bioremediation

Bioremediation is proposed to reduce the waste classification and to reduce occupational exposure risk for workers at potential disposal facilities, and to aid in handling and transport.

Enhanced aerobic bioremediation is proposed, which uses the addition of various soil ameliorants, nutrients and indigenous or added microbial sources combined with adequate oxygen to stimulate the growth of both bacteria and fungi to degrade hydrocarbons via metabolic and co-metabolic processes. Biodegradable surfactants and an additional enzyme source are also used, if required, to ensure the contaminates are bioavailable and to mitigate the removal via volatilisation.

In summary, the following process will be used:

1. Levels of nutrients and contamination will be assessed as required to determine the requirement for additional nutrients and ameliorants/additives.
2. Solids will spread to a thickness of approximately 300 mm.
3. Ameliorants/additives will be added at a predetermined ratio based on the analytical data and design, and mixed with an excavator/loader or other mechanical plant.
4. If required, moisture will be added to a water content of 30% w/w.
5. Based on the soil oxygen demand for the material, the bio-pile will be turned via mechanical plant at a suitable interval.
6. Monitoring will occur for water content, nutrients, pH and contaminant degradation, as required.

The bioremediation activity will occur on a biotreatment pad constructed on top of an impermeable 2 mm this HPDE liner that meets GRI GM13 specification. The HPDE liner will be protected via suitable geotextile material above and below the liner, with the working surface constructed from suitable material and thickness for the mechanical plant to be used. A 2%, 7-day Annual Exceedance Probability (AEP) rainfall will be used for the design of surface water containment infrastructure around the pads, such as bunds and basin(s).

Based on the processing capacity of the centrifuge, the envisaged stockpile size and treatment capacity will be 150 m^3 per month, i.e., there will be a maximum of 300 m^3 in the bioremediation area at any one time as the bio-piles complete their treatment while others are being created. Each bio-pile will be approximately 1.8 m high.

During inclement weather, the bio-pile will be covered with a geofabric or tarpaulin to reduce the potential for excessive moisture content and leaching of the hydrocarbons and potential contaminants of concern.

3. Environmental siting

The premises is located on Lot 126 on Plan 183297, Warlu Road in Cooya Pooya WA 6741, approximately 6.4 km south of Karratha in the Pilbara region of Western Australia.

Table 3.1 provides a summary of potential sensitive and environmental receptors that may be impacted by the proposed activities. No significant changes to the environmental setting have been identified since the last assessment was carried out by DWER when licence was last amended in May 2022.

Table 3.1: Sensitive human and environmental receptors

Receptor type/classification	Data source used in assessment	Distance and direction from prescribed premises boundary
Other industrial premises	Aerial imagery	Approximately 0.15 km west and 0.25 km north (Cleanaway controlled premises)
Stayover Kingfisher Village, Karratha	Aerial imagery	Approximately 2.2 km north
Groundwater abstraction bore (CAW201542(1))	L8332/2009/3 decision report dated 3 May 2022[1]	Approximately 0.5 km north
Hydrography, Linear – Seven Mile Creek	DWER-031	Approximately 1.2 km east
Hydrography, Linear – Minor non-perennial water courses	DWER-031	Approximately 0.3 km west and 1 km east
Threatened and priority ecological communities (TEC/PEC) – Roebourne Plains gilgai grasslands (P1 TEC)	DBCA-038	Approximately 1.6 km east
Underlying groundwater (non-potable purposes)	DWER, 2022	7-10 m below ground level

4. Emissions and discharges

The key emissions and discharges and associated actual or likely pathways during premises construction and operation are detailed in Table 4.1 below. The table also details the proposed control measures to assist in controlling these emissions, where necessary.

Table 4.1: Emissions and discharges

Emission or discharge type	Source of emission or discharge	Volume and frequency	Potential pathways	Proposed controls	Location on Premises Layout Plan (Attachment 8B)
Operation (decontamination activities)					
Contaminated water (spray/mist)	Washdown of decontaminated items	Intermittent, fugitive	Air, wind dispersion	• The decontamination zones are bunded and fitted with infrastructure to contain overspray. • Wind direction and strength will be observed, and activities moderated according to conditions.	Decontamination Zones

[1] Microsoft Word - L8332 Cleanaway - Karratha Liquid Solid Waste Management Facility - Decision Report - Final.DOCX

Emission or discharge type	Source of emission or discharge	Volume and frequency	Potential pathways	Proposed controls	Location on Premises Layout Plan (Attachment 8B)
Mercury vapour	Chemical cleaning and storage of waste mercury	Fugitive, very low emissions expected	Air, wind dispersion	• Chemical treatment process binds the mercury to prevent release of mercury vapour. • Mercury waste stored in lined, sealed UN-rated drums in lockable container. • Periodic mercury vapour monitoring around decontamination zones and waste storage area.	Decontamination Zones and DG Pad
Filtered industrial wash water or cleaning chemicals	Cleaning activities (leaks, spills from baths, IBCs and transfer hoses)	Intermittent, fugitive	Runoff, seepage to ground	• Decontamination area in covered shed with concrete walls, bunded concrete floor and blind concrete sumps. • Bunding regularly inspected to ensure integrity and capacity is maintained. • Chemicals stored in IBCs in DG container when not in use. • Wash water will be filtered and tested before being managed as an industrial wash water, and captured within an IBC or existing tank for treatment at the premises.	Decontamination Zones
Contaminated waste	Waste storage (leak, spill from container)	Intermittent, maximum container size 205 L	Direct discharge to ground	• Drums stored on bunded concrete hardstand pad. • Regular inspection of containers for defects, leaks. • Personnel appropriately trained in handling containers. • Periodic gamma and mercury vapour monitoring around decontamination zones and waste storage area.	Decontamination Zones and DG Pad (mercury waste) and NORMS Storage Compound/ NORMS Storage Shed (NORM waste)

Emission or discharge type	Source of emission or discharge	Volume and frequency	Potential pathways	Proposed controls	Location on Premises Layout Plan (Attachment 8B)
Operation (Dewatering and bioremediation activity)					
Sludge, centrate	Sludge dewatering (leak, spill from container/ tank/ centrifuge)	Intermittent, fugitive	Direct discharge to ground	Activity carried out on bunded concrete hardstand. Regular inspection of tanks, centrifuge and pipes.	Centrifuge
Leachate (hydrocarbons)	Bio-piles	Intermittent, fugitive	Seepage to ground	• Moisture content of bio-piles controlled and monitored. • Bio-piles covered during inclement weather.	Bio Remediation Pad 1 & 2
Odour		Intermittent, fugitive	Air, wind dispersion	• Addition of biodegradable surfactants and enzyme to mitigate volatilisation. • Regular inspection for odour at the premises boundary.	

Limitations

Scope of services

This report ("the report") has been prepared by JBS&G in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and JBS&G. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

Reliance on data

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The report is based on conditions encountered and information received at the time of preparation of this report or the time that site investigations were carried out. JBS&G disclaims responsibility for any changes that may have occurred after this time. This report and any legal issues arising from it are governed by and construed in accordance with the law as at the date of this report.

Environmental conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made, including to any third parties, and no liability will be accepted for use or interpretation of this report by any third party.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

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Attachment 2: Premises Map

Figure 1: Premises boundary – as indicated by the blue line.

Attachment 8A: Material safety data sheets

APAC Decon
14 Cocos Drive.
Bibra Lake
Perth, WA 6163
Tel - 08 9434 3919

SAFETY DATA SHEET

SECTION 1. IDENTIFICATION

Product identifier used on the label
: **NORM BIND**

Other means of identification : NORM BIND

Recommended use of the chemical and restrictions on use
: Chelating agent; Cleaning agent.
Recommended restrictions:None known.

Chemical family : Mixture.

Name, address, and telephone number of the supplier:
APAC Decon, 14 Cocos Drive, Bibra Lake, Perth, WA 6163

Name, address, and telephone number of the manufacturer:
Refer to supplier

Supplier's Telephone # : +61 8 9434 3919
24 Hr. Emergency Tel # : Chem-Tel - 1300 954 583

SECTION 2. HAZARDS IDENTIFICATION

Classification of the chemical

Clear colourless liquid. Odorless.

Most important hazards: May be corrosive to metals. Harmful if swallowed. Causes severe skin burns and eye damage. Suspected of causing cancer. Occupational exposure to the substance or mixture may cause adverse effects.

This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015).

Hazard classification:
Corrosive to metals - Category 1
Acute toxicity, oral - Category 4
Skin corrosion/irritation - Category 1B
Eye damage/irritation - Category 1
Carcinogenicity - Category 2

Label elements

Hazard pictogram(s)

Signal Word

DANGER!

Hazard statement(s)

May be corrosive to metals.
Harmful if swallowed.
Causes severe skin burns and eye damage.
Suspected of causing cancer.

SAFETY DATA SHEET

Precautionary statement(s)

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep only in original container.
Do not breathe mists.
Do not eat, drink or smoke when using this product.
Wash thoroughly after handling.
Wear protective gloves/clothing and eye/face protection.

IF exposed or concerned: Get medical attention/advice.
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Rinse mouth. Do NOT induce vomiting.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.
Absorb spillage to prevent material damage.

Store in corrosive resistant container with a resistant inner liner.
Store locked up.

Dispose of contents/container in accordance with local regulation.

Other hazards

Other hazards which do not result in classification:
Burning may produce irritating, toxic and obnoxious fumes. Ingestion can cause irritation and corrosive action in the mouth, stomach and digestive tract.

Ecological information:

Avoid release to the environment. See Section 12 for more environmental information.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixture.

Chemical name	Common name and synonyms	CAS #	Concentration (% by weight)
Inorganic potassium compound	Not available.	Proprietary	**Proprietary**
Carboxylic acid	Not available.	Proprietary	**Proprietary**
Aminopolycarboxylic acid	Not available.	Proprietary	**Proprietary**
Carboxylic acid	Not available.	Proprietary	**Proprietary**
Inorganic base	Not available.	Proprietary	**Proprietary**
Triacetic acid salt	Not available.	Proprietary	**Proprietary**

The exact concentrations and/or specific chemical identities of the above listed chemicals are being withheld as a trade secret.

APAC Decon
14 Cocos Drive.
Bibra Lake Perth,
WA 6163
Tel - 08 9434 3919

SAFETY DATA SHEET

SECTION 4. FIRST-AID MEASURES

Description of first aid measures

Ingestion : Immediately call a POISON CENTER or doctor/physician. Rinse mouth. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. If vomiting occurs spontaneously, keep victim's head lowered (forward) to reduce the risk of aspiration.

Inhalation : Immediately call a POISON CENTER or doctor/physician. Remove person to fresh air and keep comfortable for breathing. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen by qualified medical personnel only.

Skin contact : Wear appropriate protective equipment. Take off immediately all contaminated clothing. Rinse skin with water/shower. Do not rub area of contact. Wash contaminated clothing before reuse. Obtain medical attention immediately.

Eye contact : Wear appropriate protective equipment. Immediately call a POISON CENTER or doctor/physician. Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Protect unharmed eye.

Most important symptoms and effects, both acute and delayed

: Harmful if swallowed. Ingestion may cause severe burns to the mucous membranes of the digestive tract. Symptoms may include abdominal pain, vomiting, burns, perforations and bleeding. Causes serious eye damage. Symptoms may include severe pain, blurred vision, redness and corrosive damage. Chemical burns, corneal damage, and possibly blindness can result from direct contact. Causes skin burns. Symptoms may include redness, blistering, pain and swelling. Direct skin contact may cause corrosive skin burns, deep ulcerations and possibly permanent scarring. Suspected of causing cancer.

Indication of any immediate medical attention and special treatment needed

: Immediate medical attention is required.Causes chemical burns.Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media

: Alcohol resistant foam
Use water with caution.
Contact with water will generate considerable heat.
Carbon dioxide (CO2)
Dry chemical powder.

Unsuitable extinguishing media

: Do not use a solid water stream as it may scatter and spread fire.

Special hazards arising from the substance or mixture / Conditions of flammability

: Not flammable.
Burning produces obnoxious and toxic fumes.
Contact with most metals will generate flammable hydrogen gas.
Contact with water will generate considerable heat.

Flammability classification (OSHA 29 CFR 1910.106)

: Not flammable.

Hazardous combustion products

: Potassium oxides

SAFETY DATA SHEET

Special protective equipment and precautions for firefighters

Protective equipment for fire-fighters

: Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.
Do not enter without wearing specialized protective equipment suitable for the situation. Firefighter's normal protective clothing (Bunker Gear) will not provide adequate protection. A full-body encapsulating chemical protective suit with positive pressure self-contained breathing apparatus (NIOSH approved or equivalent) may be necessary.

Special fire-fighting procedures

: Do not breathe mists, vapours or sprays.
Move containers from fire area if safe to do so.
Cool closed containers exposed to fire with water spray.
Do not allow run-off from fire fighting to enter drains or water courses.
Dike for water control.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/clothing and eye/face protection. Keep people away from and upwind of spill/leak. Restrict access to area until completion of clean-up. Do not touch or walk through spilled material. Ensure clean-up is conducted by trained personnel only. All persons dealing with clean-up should wear the appropriate protective equipment including self-contained breathing apparatus. Refer to protective measures listed in sections 7 and 8.

Environmental precautions : Do not allow material to contaminate ground water system. If necessary, dike well ahead of the spill to prevent runoff into drains, sewers, or any natural waterway or drinking supply.

Methods and material for containment and cleaning up

: Ventilate the area. Remove all sources of ignition.Prevent further leakage or spillage if safe to do so.Contain and absorb spilled liquid with non-combustible, inert absorbent material (e.g. sand).Place in clean, dry and labeled containers. Refer to Section 13 for disposal of contaminated material. Contact the proper local authorities.

Special spill response procedures

: If a spill/release in excess of the EPA reportable quantity is made into the environment, immediately notify the national response center in the United States (phone: 1-800-424-8802).
EPA/CERCLA Reportable quantity(RQ): Inorganic potassium compound (1000lbs/454kg)

SECTION 7. HANDLING AND STORAGE

Precautions for safe handling

: Use only outdoors or in a well-ventilated area. Wear protective gloves/clothing and eye/face protection. In case of inadequate ventilation wear respiratory protection. Keep away from extreme heat and flame. Do not breathe mists, vapours or sprays. Avoid contact with skin, eyes and clothing.Do not eat, drink or smoke when using this product. Wash hands and face thoroughly after handling.Keep only in original container. Keep away from incompatibles. Keep containers closed when not in use. Empty containers retain residue (liquid and/or vapour) and can be dangerous. When diluting, always add the product to water. Never add water to the product.During preparation or dilution, always add liquid slowly to water and with constant stirring.

SAFETY DATA SHEET

Conditions for safe storage : Store in corrosive resistant container with a resistant inner liner. Steel is a suitable metal for packaging. Store in a well-ventilated place. Store locked up. Keep container tightly closed. Keep away from excessive heat, open flames, sparks and other sources of ignition. Store away from incompatible materials. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. No smoking. Inspect periodically for damage or leaks. Have appropriate fire extinguishers and spill clean-up equipment in or near storage area.

Incompatible materials : Acids;Organic materials; Metals (e.g. Aluminum, brass, copper, other uncoated metals)

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits:

Chemical Name	ACGIH TLV		OSHA PEL	
	TWA	STEL	PEL	STEL
Inorganic potassium compound	2 mg/m³ (Ceiling)	N/Av	2 mg/m³ (Ceiling)	N/Av
Carboxylic acid	N/Av	N/Av	N/Av	N/Av
Aminopolycarboxylic acid	N/Av	N/Av	N/Av	N/Av
Carboxylic acid	N/Av	N/Av	N/Av	N/Av
Inorganic base	2 mg/m³ (Ceiling)	N/Av	2 mg/m³	N/Av
Triacetic acid salt	N/Av	N/Av	N/Av	N/Av

Exposure controls

Ventilation and engineering measures

: Use only in well-ventilated areas. Use corrosion-resistant ventilation. Apply technical measures to comply with the occupational exposure limits. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction.In case of insufficient ventilation wear suitable respiratory equipment.

Respiratory protection : If airbourne concentrations are above the permissible exposure limit or are not known, use NIOSH-approved respirators. Respirators should be selected based on the form and concentration of contaminants in air, and in accordance with OSHA (29 CFR 1910.134) or CSA Z94.4-02. Advice should be sought from respiratory protection specialists.

Skin protection : Wear protective gloves/clothing.Impervious gloves must be worn when using this product. The suitability for a specific workplace should be discussed with the producers of the protective gloves. Wear impervious clothing to prevent skin contact. Wear chemically protective gloves (impervious), boots, aprons, and gauntlets to prevent prolonged or repeated skin contact.

Eye / face protection : Wear eye/face protection. Chemical splash goggles must be worn when handling this material. A full face shield may also be necessary.

Other protective equipment : Ensure that eyewash stations and safety showers are close to the workstation location. Other equipment may be required depending on workplace standards.

General hygiene considerations

: Do not breathe mists, vapours or sprays. Avoid contact with skin, eyes and clothing. Do not eat, drink or smoke when using this product. Wash hands thoroughly after using this product, and before eating, drinking or smoking. Remove and wash contaminated clothing before re-use.Handle in accordance with good industrial hygiene and safety practice.

SAFETY DATA SHEET

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Clear liquid.
Odour : Odourless.
Odour threshold : Not available.
pH : 10-12
Melting Point/Freezing point : Not available.
Initial boiling point and boiling range
: >93.3°C
Flash point : >93.3°C
Flashpoint (Method) : Closed cup
Evaporation rate (BuAe = 1) : Not available.
Flammability (solid, gas) : Not applicable.
Lower flammable limit (% by vol.)
: Not applicable.
Upper flammable limit (% by vol.)
: Not applicable.
Oxidizing properties : None known.
Explosive properties : Not explosive
Vapour pressure : Not available.
Vapour density : Not available.
Relative density / Specific gravity
: 1.05-1.15
Solubility in water : Soluble
Other solubility(ies) : Not available.
Partition coefficient: n-octanol/water or Coefficient of water/oil distribution
: Not available.
Auto-ignition temperature : Not applicable.
Decomposition temperature : Not available.
Viscosity : Not available.
Volatiles (% by weight) : Not available.
Volatile organic Compounds (VOC's)
: Not available.
Absolute pressure of container
: Not applicable.
Flame projection length : Not applicable.
Other physical/chemical comments
: No additional information.

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Not normally reactive. Corrosive in contact with metals. Contact with most metals (Aluminum, brass, copper, other uncoated metals) will generate flammable hydrogen gas.
Chemical stability : Stable under normal conditions.
Possibility of hazardous reactions
: None expected, when used as intended. Hazardous polymerization does not occur.
Conditions to avoid : Keep away from excessive heat, open flames, sparks and other possible sources of ignition. Do not use in areas without adequate ventilation. Avoid contact with incompatible materials.
Incompatible materials : See Section 7 (Handling and Storage) for further details.

SAFETY DATA SHEET

Hazardous decomposition products

: See Section 5 (Fire Fighting Measures).

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure:

Routes of entry inhalation : YES

Routes of entry skin & eye : YES

Routes of entry Ingestion : YES

Routes of exposure skin absorption

: YES

Potential Health Effects:

Signs and symptoms of short-term (acute) exposure

Sign and symptoms Inhalation

: May cause respiratory irritation. May cause severe irritation to the nose, throat and respiratory tract. Symptoms may include coughing, shortness of breath and eventually severe respiratory impairment. Could result in pulmonary edema (fluid accumulation). Symptoms of pulmonary edema (chest pain, shortness of breath) may be delayed.

Sign and symptoms ingestion

: Harmful if swallowed. Ingestion may cause severe burns to the mucous membranes of the digestive tract. Symptoms may include abdominal pain, vomiting, burns, perforations and bleeding.

Sign and symptoms skin : Causes skin burns. Symptoms may include redness, blistering, pain and swelling. Direct skin contact may cause corrosive skin burns, deep ulcerations and possibly permanent scarring.

Sign and symptoms eyes : Causes serious eye damage. Symptoms may include severe pain, blurred vision, redness and corrosive damage. Chemical burns, corneal damage, and possibly blindness can result from direct contact.

Potential Chronic Health Effects

: Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

Mutagenicity : Not expected to be mutagenic in humans.

Carcinogenicity : This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification:
Carcinogenicity - Category 2
Suspected of causing cancer.
Contains Trisodium Nitriloacetate. Trisodium Nitriloacetate is classified as probably or reasonably anticipated to be carcinogenic by IARC (Group 2B).

Reproductive effects & Teratogenicity

: Not expected to cause reproductive effects.

Sensitization to material : Not expected to be a skin or respiratory sensitizer.

Specific target organ effects : Target Organs: Eyes, skin, respiratory system and digestive system.

According to the classification criteria of U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015), this product is not expected to cause target organ toxicity through single or repeated exposures.

Medical conditions aggravated by overexposure

: Pre-existing skin, eye and respiratory disorders.

SAFETY DATA SHEET

Synergistic materials : No information available.

Toxicological data : There is no data available for this product. The calculated ATE values for this mixture are:
ATE oral =1,924.43 mg/kg

Chemical name	LC_{50}(4hr) inh, rat	LD_{50} (Oral, rat)	LD_{50} (Rabbit, dermal)
Inorganic potassium compound	N/Av	205 mg/kg	> 1260 mg/kg
Carboxylic acid	N/Av	>2000mg/kg	N/Av
Aminopolycarboxylic acid	N/Av	N/Av	N/Av
Carboxylic acid	N/Av	7500 mg/kg	20,000 mg/kg
Inorganic base	N/Av	N/Av	N/Av
Triacetic acid salt	>5 mg/L 4 h	1470 mg/kg	2000 mg/kg (no deaths)

Other important toxicological hazards
: None reported by the manufacturer.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity : Toxicity is primarily associated with pH. The product should not be allowed to enter drains or water courses, or be deposited where it can affect ground or surface waters. See the following tables for the substance's ecotoxicity data.

Ecotoxicity data:

Ingredients	CAS #	Toxicity to Fish		
		LC50 / 96h	NOEC / 21 day	M Factor
Inorganic potassium compound	Proprietary	80 mg/L (Mosquito fish)	N/Av	None.
Carboxylic acid	Proprietary	>41mg/L (Bluegill sunfish)	N/Av	None.
Aminopolycarboxylic acid	Proprietary	N/Av	N/Av	None.
Carboxylic acid	Proprietary	34.1 mg/L	N/Av	None.
Inorganic base	Proprietary	125 mg/L (Mosquito fish)	N/Av	None.
Triacetic acid salt	Proprietary	103mg/L (Fathead minnow)	54 mg/L (Fathead minnow)	None.

SAFETY DATA SHEET

Ingredients	CAS #	Toxicity to Daphnia		
		EC50 / 48h	NOEC / 21 day	M Factor
Inorganic potassium compound	Proprietary	56 mg/L Ceriodaphnia (water flea)	N/Av	None.
Carboxylic acid	Proprietary	140mg/L (Daphnia magna)	N/Av	None.
Aminopolycarboxylic acid	Proprietary	>500 mg/L	N/Av	None.
Carboxylic acid	Proprietary	137 mg/L	N/Av	None.
Inorganic base	Proprietary	40.4 mg/L (Daphnia magna)	N/Av	None.
Triacetic acid salt	Proprietary	80 mg/L (Daphnia magna)	80 mg/L (Daphnia magna)	None.

Ingredients	CAS #	Toxicity to Algae		
		EC50 / 96h or 72h	NOEC / 96h or 72h	M Factor
Inorganic potassium compound	Proprietary	N/Av	N/Av	None.
Carboxylic acid	Proprietary	>100mg/L (Green algae)	N/Av	None.
Aminopolycarboxylic acid	Proprietary	2.6 mg/L	N/Av	None.
Carboxylic acid	Proprietary	N/Av	N/Av	None.
Inorganic base	Proprietary	N/Av	N/Av	None.
Triacetic acid salt	Proprietary	91.5 mg/L (Green algae)	1.43mg/L (Green algae)	None.

Persistence and degradability

: Biodegradation is not applicable to inorganic substances.

Bioaccumulation potential : No information available. See the following data for ingredient information.

Components	Partition coefficient n-octanol/water (log Kow)	Bioconcentration factor (BCF)
Carboxylic acid (CAS Proprietary)	N/Av	N/Av
Aminopolycarboxylic acid(CAS Proprietary)	-3.05 at 25 °C	
Triacetic acid salt (CAS Proprietary)	-10.08	N/Av

Mobility in soil : There is no data available for this product.

Other Adverse Environmental effects

: No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

SAFETY DATA SHEET

SECTION 13. DISPOSAL CONSIDERATIONS

Handling for Disposal : Handle in accordance with good industrial hygiene and safety practice. Since emptied containers may retain product residue, follow label warnings even after container is emptied.Refer to protective measures listed in sections 7 and 8.

Methods of Disposal : Dispose in accordance with all applicable federal, state, provincial and local regulations.

RCRA : If this product, as supplied, becomes a waste in the United States, it may meet the criteria of a hazardous waste as defined under RCRA, Title 40 CFR 261.It is the responsibility of the waste generator to determine the proper waste identification and disposal method.For disposal of unused or waste material, check with local, state and federal environmental agencies.

SECTION 14. TRANSPORT INFORMATION

Regulatory Information	UN Number	UN proper shipping name	Transport hazard class(es)	Packing Group	Label
49CFR/DOT	UN1760	CORROSIVE LIQUID, N.O.S.	8	III	
49CFR/DOT Additional information	Consult supplier for required technical names.				
TDG	UN1760	CORROSIVE LIQUID, N.O.S.	8	III	
TDG Additional information	Consult supplier for required technical names.				

Special precautions for user : Appropriate advice on safety must accompany the package.

Environmental hazards : This product does not meet the criteria for an environmentally hazardous mixture, according to the IMDG Code. See ECOLOGICAL INFORMATION, Section 12.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

: This information is not available.

SAFETY DATA SHEET

SECTION 15 - REGULATORY INFORMATION

US Federal Information:

Components listed below are present on the following U.S. Federal chemical lists:

Ingredients	CAS #	TSCA Inventory	CERCLA Reportable Quantity(RQ) (40 CFR 117.302):	SARA TITLE III: Sec. 302, Extremely Hazardous Substance, 40 CFR 355:	SARA TITLE III: Sec. 313, 40 CFR 372, Specific Toxic Chemical	
					Toxic Chemical	de minimus Concentration
Inorganic potassium compound	Proprietary	Yes	1000 lb/ 454 kg	None.	No	N/Ap
Carboxylic acid	Proprietary	Yes	5000 lb/ 2270 kg	N/Av	No	N/Ap
Aminopolycarboxylic acid	Proprietary	Yes	N/Ap	N/Av	No	NS
Carboxylic acid	Proprietary	NL	N/Ap	N/Av	No	NS
Inorganic base	Proprietary	Yes	1000 lb/ 454 kg	N/Av	No	NS
Triacetic acid salt	Proprietary	Yes	N/Ap	N/Av	No	NS

SARA TITLE III: Sec. 311 and 312, SDS Requirements, 40 CFR 370 Hazard Classes: Immediate (Acute) health hazard; Chronic Health Hazard. Under SARA Sections 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

US State Right to Know Laws:

The following chemicals are specifically listed by individual States:

Ingredients	CAS #	California Proposition 65		State "Right to Know" Lists					
		Listed	Type of Toxicity	CA	MA	MN	NJ	PA	RI
Inorganic potassium compound	Proprietary	No	N/Ap	Yes	Yes	Yes	Yes	Yes	Yes
Carboxylic acid	Proprietary	No	N/Ap	Yes	Yes	No	Yes	Yes	No
Aminopolycarboxylic acid	Proprietary	No	N/Ap	No	No	No	No	No	No
Carboxylic acid	Proprietary	No	N/Ap	No	No	No	No	Yes	Yes
Inorganic base	Proprietary	No	N/Ap	Yes	Yes	Yes	Yes	Yes	Yes
Triacetic acid salt	Proprietary	No	N/Ap	No	Yes	No	No	No	No

Canadian Information:

Canadian Environmental Protection Act (CEPA) information: All ingredients listed appear on the Domestic Substances List (DSL).

WHMIS information: Refer to Section 2 for a WHMIS Classification for this product.

SAFETY DATA SHEET

International Information:

Components listed below are present on the following International Inventory list:

Ingredients	CAS #	European EINECs	Australia AICS	Philippines PICCS	Japan ENCS	Korea KECI/KECL	China IECSC	NewZealand IOC
Inorganic potassium compound	N/Av	Present	Present	Present	Present	Present	Present	Present
Carboxylic acid	N/Av	Present	Present	Present	Present	Present	Present	Present
Aminopolycarboxylic acid	N/Av	Present	Present	Present	Present	Present	Present	Present
Carboxylic acid	N/Av	N/Av	Present	Present	Present	N/Av	Present	Present
Inorganic base	N/Av	Present	Present	Present	Present	Present	Present	Present
Triacetic acid salt	N/Av	Present	Present	Present	Present	Present	Present	Present

SECTION 16. OTHER INFORMATION

Legend : ACGIH: American Conference of Governmental Industrial Hygienists
AICS: Australian Inventory of Chemical Substances
CAS: Chemical Abstract Services
CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR: Code of Federal Regulations
CSA: Canadian Standards Association
DOT: Department of Transportation
EC50: Effective Concentration 50%
ENCS: Existing and New Chemical Substances
EPA: Environmental Protection Agency
HSDB: Hazardous Substances Data Bank
IARC: International Agency for Research on Cancer
IATA: International Air Transport Association
IBC: Intermediate Bulk Container
ICAO: International Civil Aviation Organisation
IECSC: Inventory of Existing Chemical Substances
Inh: Inhalation
IMDG: International Maritime Dangerous Goods
IOC: Inventory of Chemicals
KECI: Korean Existing Chemicals Inventory
KECL: Korean Existing Chemicals List
LC: Lethal Concentration
LD: Lethal Dose
N/Ap: Not Applicable
N/Av: Not Available
NIOSH: National Institute of Occupational Safety and Health
NOEC: No observable effect concentration
NTP: National Toxicology Program
OECD: Organisation for Economic Co-operation and Development
OSHA: Occupational Safety and Health Administration
PEL: Permissible exposure limit
PICCS: Philippine Inventory of Chemicals and Chemical Substances
RTECS: Registry of Toxic Effects of Chemical Substances
SARA: Superfund Amendments and Reauthorization Act
SDS: Safety Data Sheet
STEL: Short Term Exposure Limit
TDG: Canadian Transportation of Dangerous Goods Act & Regulations

SAFETY DATA SHEET

TLV: Threshold Limit Values
TSCA: Toxic Substance Control Act
TWA: Time Weighted Average
WHMIS: Workplace Hazardous Materials Identification System

References : 1. ACGIH, Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices
2. ECHA - European Chemical Agency
3. Canadian Centre for Occupational Health and Safety, CCInfoWeb databases
4. Safety Data Sheets from manufacturer.
5. US EPA Title III List of Lists
6. California Proposition 65 List
7. OECD - The Global Portal to Information on Chemical Substances - eChemPortal

Preparation Date (mm/dd/yyyy)

: 11/06/2024

Other special considerations for handling

: Provide adequate information, instruction and training for operators.

Prepared for:

APAC Decon
14 Cocos Drive.
Bibra Lake Perth,
WA 6163
Tel - 08 9434 3919

END OF DOCUMENT

SAFETY DATA SHEET

APAC DECON NORM Filter

SDS Preparation Date (mm/dd/yyyy): 09/09/2024

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name **APAC DECON NORM FILTER**

Synonyms NORM PRECIPITANT

1.2 Uses and uses advised against

Uses RADIONUCLIDE ISOTOPE PRECIPITANT

1.3 Details of the supplier of the product

Supplier name **APAC DECON PTY LTD.**

Address 14 Cocos Drive, Bibra Lake, Perth, WA, 6163, AUSTRALIA

Telephone 08 9434 3919

Website www.apacdecon.com

1.4 Emergency telephone numbers

Emergency - CHEMTEL - 1300 954 583

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

2.2 GHS Label elements

No signal word, pictograms, hazard or precautionary statements have been allocated.

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
CALCIUM CHLORIDE	10043-52-4	233-140-8	<20%
NON HAZARDOUS INGREDIENTS	Not Available	Not Available	Remainder
WATER	7732-18-5	231-791-2	<70%

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. seek medical assistance.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

First aid facilities Eye wash facilities and safety shower should be available.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

4.3 Immediate medical attention and special treatment needed
Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media
Use an extinguishing agent suitable for the surrounding fire.

5.2 Special hazards arising from the substance or mixture
Non flammable. May evolve toxic gases if strongly heated.

5.3 Advice for firefighters
Treat as per requirements for surrounding fires. Evacuate area and contact emergency services. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

5.4 Hazchem code
None allocated.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS.

6.2 Environmental precautions
Prevent product from entering drains and waterways.

6.3 Methods of cleaning up
Contain spillage, then cover / absorb spill with non-combustible absorbent material (vermiculite, sand, or similar), collect and place in suitable containers for disposal.

6.4 Reference to other sections
See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities
Store tightly sealed in a cool, dry, well ventilated area, removed from incompatible substances and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills.

7.3 Specific end uses
No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters
Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m³	ppm	mg/m³
Calcium Chloride dust (peak limitation)	SWA [AUS]	--	10 (Peak)	--	--

Biological limits
No biological limit values have been entered for this product.

8.2 Exposure controls
Engineering controls Avoid inhalation. Use in well ventilated areas.

PPE

Eye / Face	Wear splash-proof goggles.
Hands	Wear PVC or rubber gloves.
Body	When using large quantities or where heavy contamination is likely, wear coveralls.
Respiratory	Not required under normal conditions of use.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	CLEAR SLIGHT HAZE LIQUID
Odour	SLIGHT ODOUR
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	> 100°C
Melting point	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	NOT AVAILABLE
Vapour density	NOT RELEVANT
Specific gravity	NOT AVAILABLE
Solubility (water)	NOT AVAILABLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization is not expected to occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible with oxidising agents (e.g. hypochlorites).

10.6 Hazardous decomposition products

May evolve toxic gases if heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity Based on available data, the classification criteria are not met.

Skin	Contact may result in mild irritation, redness and rash.
Eye	Contact may result in mild irritation, lacrimation and redness.
Sensitisation	Not classified as causing skin or respiratory sensitisation.
Mutagenicity	Not classified as a mutagen.
Carcinogenicity	Not classified as a carcinogen.
Reproductive	Not classified as a reproductive toxin.
STOT - single exposure	Not classified as causing organ damage from single exposure. However, over exposure may result in irritation of the nose and throat, with coughing.
STOT - repeated exposure	Not classified as causing organ damage from repeated exposure.
Aspiration	Not classified as causing aspiration.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No information provided.

12.2 Persistence and degradability

This product is readily biodegradable.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

No information provided.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal	Reuse where possible. Alternatively, absorb with sand or similar and dispose of to an approved landfill site. Contact the manufacturer/supplier for additional information (if required).
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE, IMDG OR IATA

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	None allocated.	None allocated.	None allocated.
14.2 Proper Shipping Name	None allocated.	None allocated.	None allocated.
14.3 Transport hazard class	None allocated.	None allocated.	None allocated.
14.4 Packing Group	None allocated.	None allocated.	None allocated.

14.5 Environmental hazards

No information provided.

14.6 Special precautions for user

Hazchem code None allocated.

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Poison schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

Inventory listings **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as form of product, method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:
It should be noted that the effects from exposure to this product will depend on several factors including: form of product; frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS	Globally Harmonized System
GTEPG	Group Text Emergency Procedure Guide
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

[End of SDS]

APAC Decon NORM Strip

1 PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: APAC Decon NORM STRIP
SDS Number: APAC Decon NORM STRIP
Revision Date: 11/06/2024
Version: 1
Product Use: Inorganic NORM Scale Solvent

Supplier Details: APAC Decon
14 Cocos Drive, Bibra Lake,
WA 6163

Phone: 08 9434 3919
Emergency: Chem-Tel 1300 954 583

2 HAZARDS IDENTIFICATION

Classification of the Substance or Mixture

GHS Classification in Accordance with 29 CFR 1910 (OSHA HCS):

Health, Skin corrosion/irritation, 1
Health, Serious Eye Damage/Eye Irritation, 1

GHS Label Elements, Including Precautionary Statements

GHS Signal Word: DANGER

GHS Hazard Pictograms:

GHS Hazard Statements:

H314 - Causes severe skin burns and eye damage
H318 - Causes serious eye damage

GHS Precautionary Statements:

P264 - Wash skin thoroughly after handling.
P273 - Avoid release to the environment.
P280 - Wear protective gloves/ eye protection/ face protection.
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 - Immediately call a POISON CENTER or doctor/ physician.
P321 - Specific treatment (see supplemental first aid instructions on this label).
P332 + P313 - If skin irritation occurs: Get medical advice/ attention.
P362 - Take off contaminated clothing and wash before reuse.
P501 - Dispose of contents/ container to an approved waste disposal plant.

3 COMPOSITION/INFORMATION OF INGREDIENTS

Chemical Ingredients:

CAS#	%	Chemical Name:
7732-18-5	>50%	Water
5329-14-6	5-20%	Sulfamic acid

The chemical composition consists of non-hazardous components that do not require disclosure according to applicable regulations.

The specific identity and percentage of chemicals used in this product have been withheld as a trade secret.

4 FIRST AID MEASURES

Inhalation: If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Skin Contact: If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Launder clothing before reuse. Seek medical attention if irriation persists. Wash with soap and water.

Eye Contact: Flush eyes with plenty of water and get medical attention if irritation persists. Hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poison Information Center, a doctor, or for at least 15 minutes.

Ingestion: If swallowed, do not induce vomiting. Rinse mouth out with water. Drink plenty of water. Seek medical advise immediately by calling a Poison Control Center or a doctor.

5 FIRE FIGHTING MEASURES

Flammability: Non-combustible

Flash Point: Not applicable

Autoignition Temp: >800 degF

Extinguishing Media:
Use appropriate material for surrounding area

Specific Chemical Hazard:
None

Special Firefighting Procedures:
Fire fighters should wear self-contained breathing apparatus and full protection clothing when fighting chemical fires. Cool exposed containers with water spray.

Hazardous Combustion Products:
See Hazardous Decomposition Products. (See Section #10)

Hazardous Polymerization:
Will not occur

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions

Wear specified protective equipment. (See Section #8)

Environmental Precautions

Prevent from entering sewers or waterways. If environmental release does occur, inform the appropriate supervisory personnel. If safe to do so, prevent further release.

Methods for clean up

For small spills - Cover spill with absorbent material. Scoop absorbed material into a suitable container for disposal. Recover product to suitable containers or vessel for reuse, if possible, or for disposal.

For large spills - Immediately stop the flow of material if safe to do so. Dike the spill to prevent spreading. Use appropriate absorbent material and move into a suitable container. Wash the contaminated area.

7 HANDLING AND STORAGE

Handling Precautions: Wear specified protective equipment. (See Section #8) Use only in a well-ventilated area. Before use carefully read the product label. Use safe work practices to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking, and smoking in contaminated areas.

Storage Requirements: Keep container tightly closed. Store in cool, dry, well-ventilated area removed from incompatible substances, heat, or ignition sources and foodstuffs. Ensure containers are adequately labeled, protected from physical damage and sealed when not in use.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:	Use only in a well-ventilated area.
Personal Protective Equipment:	Eye/face protection: Wear chemical safety goggles. If any inhalation hazards exist, a full-face respirator may be required instead. Hand protection: Wear chemical-resistant gloves. Skin protection: Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact. Respiratory protection: If a risk assessment deems necessary, use a properly fitted supplied air respirator complying with an approved standard.

Occupational Exposure Limits

Exposure limits are not available for this product.

Biological Limits:

No biological limits have been entered for this product.

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear, amber
Physical State:	Liquid
Odor:	Mild odor
Solubility:	Complete in water
Spec Grav./Density:	0.97-1.03
Viscosity:	Thin liquid
Boiling Point:	>200 degF
Flammability:	Non-combustible
Flash Point:	Not applicable
pH:	1.0-2.0
Auto-Ignition Temp:	>800 degF
Decomp Temp:	>600 degF

10 STABILITY AND REACTIVITY

Reactivity:	Reacts violently with oxidizers. Reacts exothermically with some bases.
Chemical Stability:	Stable under normal condiitons of use.
Conditions to Avoid:	Incompatible materials
Materials to Avoid:	Strong oxidizers, strong bases, and strong reducing agents
Hazardous Decomposition:	Sulfur compounds
Hazardous Polymerization:	None known

11 TOXICOLOGICAL INFORMATION

Acute toxicity estimates:
Oral - >5000 mg/kg
Dermal - >5000 mg/kg

Skin corrosion/irritation:
Causes severe skin burns

pH: 1-2

Serious eye damage/irriation:

Causes serious eye damage
pH: 1-2

Sensitization:
No applicable toxicity data

Mutagencity:
No applicable toxicity data

Carcinogencity:
None of the components of this product have been listed as carcinogenic by IARC, NTP, or OSHA. (IARC - International Agency for Research on Cancer) (NTP - National Toxicology Program) (OSHA - Occupational Safety & Health Administration (US))

Reproductive toxicity:
No applicable toxicity data

Specific target organ toxicity (single exposure):
No applicable toxicity data

Specific target organ toxicity (repeated exposure):
No applicable toxicity data

Aspiration hazard:
Not available

Likely routes of entry anticipated:
Eye and skin contact

Toxicological symptoms related to the physical, chemical, and characteristics:
Information is not available

Delayed and immediate effects and also chronic effects from short and long term exposure:
Information is not available

12 ECOLOGICAL INFORMATION

Ecotoxicity data:
No information available for this product

Persistence and degradability
This product is readily biodegradable

Bioaccumulative potential
Not expected to bioaccumulate

Mobility in soil
Expected to be mobile in soils

Other adverse effects
None known

13 DISPOSAL CONSIDERATIONS

Further Information:
Dispose of all waste and contaminated equipment in accordance with all applicable federal, state, and local health and environmental regulations. Recovery and reuse, rather than disposal, should be the ultimate goal of handling efforts. The materials resulting from clean-up operations may be hazardous wastes and therefore, subject to specific regulations.
Comply with federal, state, or local regulations for disposal.

14 TRANSPORT INFORMATION

UN1760, Corrosive, Liquid, Acidic, Inorganic, n.o.s., 8, PGIII

Land transport ADR/RID and GGVS /

GGVE: UN Number	UN1760	Corrosive, Liquid, Acidic, Inorganic, n.o.s.
Transport hazard class	8	
Packing group	III	

Sea transport IMDG/GGVSee:

UN Number	UN1760	Corrosive, Liquid, Acidic, Inorganic, n.o.s.
Transport hazard class	8	
Packing group	III	

Air Transport ICAO-TI and IATA-DGR:

UN Number	UN1760	Corrosive, Liquid, Acidic, Inorganic, n.o.s.
Transport hazard class	8	
Packing group	III	

Transport/Further information:

15 REGULATORY INFORMATION

[%] RQ (CAS#) Substance - Reg Codes

[>50%] Water (7732-18-5) TSCA

[5-20%] Sulfamic acid (5329-14-6) TSCA

This product does not contain chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Regulatory Code Legend

TSCA = Toxic Substances Control Act

16 OTHER INFORMATION

NFPA: Health = 2, Fire = 0, Reactivity = 0, Specific Hazard = n/a
HMIS III: Health = 2, Fire = 0, Physical Hazard = 0
HMIS PPE: B - Safety Glasses, Gloves

APAC Decon NORM Strip

The information contained herein is based on data considered accurate, however, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes risk in his use of the material.

Revision:	Section Changed:	Changes Made:	Date:
1	N/A	Initial issue of document	11-06-2024

SAFETY DATA SHEET
HYDRATED LIME
REVISION 8, DATE 17 AUG 2020

1. IDENTIFICATION

Product Name	**Hydrated Lime**
Other Names	Calcium dihydroxide; Lime Hydrated; Plaster Lime; Slaked lime
Uses	Used in building applications, water treatment and road stabilisation.
Chemical Family	No Data Available
Chemical Formula	Ca(OH)2
Chemical Name	Calcium hydroxide
Product Description	No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia	+60-3-5614-2111

Emergency Contact Details

For emergencies only; DO NOT contact these companies for general product advice.

Organisation	Location	Telephone
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust)	Not Scheduled

Globally Harmonised System

Hazard Classification			Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)
Hazard Categories			Skin Corrosion/Irritation - Category 2
			Serious Eye Damage/Irritation - Category 1
			Specific Target Organ Toxicity (Single Exposure) - Category 3
Pictograms			
Signal Word			Danger
Hazard Statements		**H315**	Causes skin irritation.
		H318	Causes serious eye damage.
		H335	May cause respiratory irritation.
Precautionary Statements	Prevention	**P280**	Wear protective gloves/eye protection/face protection.
		P261	Avoid breathing dust.
		P271	Use only outdoors or in a well-ventilated area.
	Response	**P305 + P351 + P338 + P310**	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTRE/doctor.
		P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
		P312	Call a POISON CENTER or doctor if you feel unwell.
		P332 + P313	If skin irritation occurs: Get medical attention.
		P304 + P340	IF INHALED: Remove victim to fresh air and keep comfortable for breathing.
		P362 + P364	Take off contaminated clothing and wash it before reuse.
	Storage	**P403 + P233**	Store in a well-ventilated place. Keep container tightly closed.
		P405	Store locked up.
	Disposal	**P501**	Dispose of contents/container in accordance with local / regional / national / international regulations.

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

HSNO Classifications	Health Hazards	**6.1E**	Substances that are acutely toxic –May be harmful, Aspiration hazard
		6.3A	Substances that are irritating to the skin
		8.3A	Substances that are corrosive to ocular tissue

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Calcium hydroxide	Ca(OH)2	1305-62-0	<=100 %
Contains: Crystalline Silica	SiO2	14808-60-7	<=1 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed IF SWALLOWED: Rinse mouth thoroughly with water, then drink plenty of water. Do not induce vomiting. Get medical attention immediately! Never give anything by mouth to an unconscious person.

Eye IF IN EYES: Immediately flush eyes with running water for several minutes, holding eyelids open and occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do. Continue rinsing for at least 15 minutes. Immediately call a Poison Centre or doctor/physician for advice. Get medical attention immediately!

Skin IF ON SKIN: Gently brush contaminated body surfaces in order to remove all traces of product. Immediately flush skin with running water/shower, while removing contaminated clothing and shoes. If skin irritation occurs, get medical advice/attention. Wash contaminated clothing and shoes before reuse.

Inhaled IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a Poison Centre or doctor/physician for advice. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult. Get medical attention immediately!

Advice to Doctor Treat symptomatically. Ensure that attending medical personnel are aware of the identity and nature of the product(s) involved, and take precautions to protect themselves.
*Local effects (pH-effect) are the major health hazard. No known delayed effects. Consult a physician for all exposures except for minor instances.

Medical Conditions Aggravated by Exposure May aggravate pre-existing upper respiratory and lung disorders such as bronchitis, emphysema and asthma.

5. FIRE FIGHTING MEASURES

General Measures If safe to do so, move undamaged containers from fire area. Cool containers with water spray until well after fire is out.

Flammability Conditions Non-combustible; Material does not burn.

Extinguishing Media If material is involved in a fire, use dry chemical, Carbon dioxide (CO2) or foam for extinction - Do NOT use water.
*Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Fire and Explosion Hazard The product decomposes with loss of water at approx. 580 °C to form calcium oxide (Quicklime).

Hazardous Products of Combustion Fire or heat may produce irritating, toxic and/or corrosive fumes.

Special Fire Fighting Instructions Contain runoff from fire control or dilution water - Runoff may cause pollution.

Personal Protective Equipment Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.

Flash Point No Data Available

Lower Explosion Limit No Data Available

Upper Explosion Limit No Data Available

Auto Ignition Temperature No Data Available

Hazchem Code No Data Available

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Ensure adequate ventilation. ELIMINATE all ignition sources. Do not touch or walk through spilled material. Avoid generating dust. Avoid breathing dust and contact with eyes, skin and clothing.
Clean Up Procedures	Collect material and place into suitable containers for subsequent recycling or disposal (see SECTION 13). *Keep the material dry, if possible.
Containment	Stop leak if you can do it without risk. Prevent dust cloud. Cover powder spill with plastic sheet or tarp to minimise spreading or contact with rain.
Decontamination	Wash surfaces well with soap and water.
Environmental Precautionary Measures	Prevent entry into drains and waterways.
Evacuation Criteria	Spill or leak area should be isolated immediately. Keep unauthorised/unprotected personnel away.
Personal Precautionary Measures	Use personal protective equipment as required (see SECTION 8).

7. HANDLING AND STORAGE

Handling	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation - Use only outdoors or in a well-ventilated area. Handle in accordance with good industrial hygiene and safety practice. Minimise dust generation and accumulation. Avoid breathing dust and contact with eyes, skin and clothing. Do not ingest. Use personal protective equipment as required (see SECTION 8). Avoid heating to decomposition.
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight. Protect from moisture. Keep container tightly closed. Protect from physical damage. Keep away from heat and sources of ignition - No smoking. Keep away from foodstuffs and incompatible materials (see SECTION 10). Store locked up.
Container	Keep in the original container or suitable, properly labelled containers. *Do NOT use aluminium for transport and storage if there is a risk of contact with water.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	For Calcium hydroxide (CAS No. 1305-62-0): - Safe Work Australia Exposure Standard: TWA = 5 mg/m3 - New Zealand Workplace Exposure Standard [Next review 2022]: TWA = 5 mg/m3 COMPONENT: Silica - Crystalline (all forms): - Safe Work Australia Exposure Standard (respirable dust): TWA = 0.05 mg/m3; Known to have carcinogenic potential for humans (Carc. 1A). - New Zealand Workplace Exposure Standard [Next review 2022]: TWA = 0.05 mg/m3 (respirable dust); Known or presumed human carcinogen (carcinogen category 1).
Exposure Limits	No Data Available
Biological Limits	No information available.
Engineering Measures	Provide sufficient ventilation to keep airborne levels below the exposure limits. Where dusts are generated, particularly in enclosed areas, and natural ventilation is inadequate, a local exhaust ventilation system is required.
Personal Protection Equipment	- Respiratory protection: In case of inadequate ventilation, wear respiratory protection. Recommended: Dust mask/particulate filter respirator (refer to AS/NZS 1715 & 1716). - Eye/face protection: Wear appropriate eye protection to prevent eye contact. Recommended: Safety glasses with side-shields or chemical goggles. It is also advisable to have individual pocket eyewash. - Hand protection: Wear protective gloves. Recommended: Gloves of impervious material, such as PVC. - Skin/body protection: Wear appropriate personal protective clothing to avoid skin contact. Recommended: Cotton coveralls; Chemical-resistant apron is recommended where large quantities are handled.
Special Hazards Precaustions	No information available.
Work Hygienic Practices	Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Take off contaminated clothing and wash it before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Powder
Odour	Odourless/slight
Colour	White or off-white
pH	>=12 (aqueous slurry)
Vapour Pressure	No Data Available
Relative Vapour Density	No Data Available
Boiling Point	No Data Available
Melting Point	>450
Freezing Point	No Data Available
Solubility	Slightly soluble in water (1.6 - 1.8 g/L)
Specific Gravity	2.10 - 2.40
Flash Point	No Data Available
Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	200 - 800 kg/m3 (20 °C)
Corrosion Rate	No Data Available
Decomposition Temperature	580 °C
Density	No Data Available
Specific Heat	No Data Available
Molecular Weight	74.09 g/mol
Net Propellant Weight	No Data Available
Octanol Water Coefficient	No Data Available
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	No Data Available
Volatile Percent	No Data Available
VOC Volume	No Data Available
Additional Characteristics	No information available.
Potential for Dust Explosion	Does not cause dust explosions.
Fast or Intensely Burning Characteristics	No information available.
Flame Propagation or Burning Rate of Solid Materials	No information available.
Non-Flammables That Could Contribute Unusual Hazards to a Fire	No information available.
Properties That May Initiate or Contribute to Fire Intensity	Non-combustible; Material does not burn.
Reactions That Release Gases or Vapours	Decomposes on heating - This produces calcium oxide.
Release of Invisible Flammable Vapours and Gases	Attacks many metals in the presence of water - This produces flammable/explosive gas.

10. STABILITY AND REACTIVITY

General Information	The solution in water is a medium strong base. Reacts violently with acids. Attacks many metals in the presence of water - This produces flammable/explosive gas.
Chemical Stability	Stable under normal conditions of storage and handling.
Conditions to Avoid	Avoid generating dust. Avoid heating to decomposition.
Materials to Avoid	Incompatible/reactive with oxidising agents, strong acids, nitro-organic compounds, maleic anhydride and phosphorus.
Hazardous Decomposition Products	Decomposes on heating - This produces calcium oxide.
Hazardous Polymerisation	Will not occur.

11. TOXICOLOGICAL INFORMATION

General Information	- Acute toxicity: Slightly corrosive; Ingestion may result in burns to the mouth and throat, with vomiting and abdominal pain. - Skin corrosion/irritation: Causes skin irritation. Skin contact may cause redness, roughness, pain, dry skin, possible burns and blisters. - Eye damage/irritation: Causes serious eye damage. Eye contact may cause pain, redness, corneal burns and ulceration with possible permanent damage. - Respiratory/skin sensitisation: Not expected to be a respiratory or skin sensitiser. - Germ cell mutagenicity: Not considered to be a mutagenic hazard. - Carcinogenicity: Not considered to be a carcinogenic hazard. Contains: Crystalline Silica (<1%). Silica dust, crystalline, in the form of quartz or cristobalite is classified by the IARC Monographs as "Carcinogenic to humans" (Group 1). - Reproductive toxicity: Not considered to be toxic to reproduction. - STOT (single exposure): May cause respiratory irritation, sore throat, cough, burning sensation. Over exposure may result in severe mucous membrane irritation and bronchitis. - STOT (repeated exposure): Not expected to cause toxicity to a specific target organ through prolonged or repeated exposure. Repeated or prolonged contact with skin may cause dermatitis. Repeated or prolonged inhalation may cause effects on the lungs. - Aspiration toxicity: Not expected to be an aspiration hazard.
Acute	
Ingestion	Acute toxicity (Oral): - LD50, Rats: >2,000 mg/kg bw. (Calcium hydroxide).
Carcinogen Category	None

12. ECOLOGICAL INFORMATION

Ecotoxicity	No information available.
Persistence/Degradability	No information available.
Mobility	No information available.
Environmental Fate	Slightly hazardous to water. The aquatic toxicity of calcium hydroxide is due to its alkalinity. Prevent entry into drains and waterways.
Bioaccumulation Potential	Calcium hydroxide does not bioaccumulate in the environment.
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Reuse or recycle, where possible. If reuse or recycling is not possible, dispose of contents/container in accordance with local/regional/national regulations.
Special Precautions for Land Fill	Processing, use or contamination of this product may change the waste management options.

14. TRANSPORT INFORMATION

Land Transport (Australia)
ADG Code

Proper Shipping Name	Hydrated Lime
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (Malaysia)
ADR Code

Proper Shipping Name	Hydrated Lime
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (New Zealand)
NZS5433

Proper Shipping Name	Hydrated Lime
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (Papua New Guinea)
ADG Code

Proper Shipping Name	Hydrated Lime
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (United States of America)
US DOT

Proper Shipping Name	Hydrated Lime
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Sea Transport
IMDG Code

Proper Shipping Name	Hydrated Lime
Class	No Data Available
Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
EMS	No Data Available
Marine Pollutant	No
Comments	NON-DANGEROUS GOODS: Not regulated for SEA transport.

Air Transport
IATA DGR

Proper Shipping Name	Hydrated Lime
Class	No Data Available
Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for AIR transport.

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

15. REGULATORY INFORMATION

General Information	No Data Available
Poisons Schedule (Aust)	Not Scheduled

Environmental Protection Authority (New Zealand)
Hazardous Substances and New Organisms Amendment Act 2015

Approval Code	HSR002503 HSR002925 (Revoked)

National/Regional Inventories

Australia (AIIC)	Listed
Canada (DSL)	Not Determined
Canada (NDSL)	Not Determined
China (IECSC)	Not Determined
Europe (EINECS)	Not Determined
Europe (REACh)	Not Determined
Japan (ENCS/METI)	Not Determined
Korea (KECI)	Not Determined
Malaysia (EHS Register)	Not Determined
New Zealand (NZIoC)	Listed
Philippines (PICCS)	Not Determined
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined
Taiwan (NCSR)	Not Determined
USA (TSCA)	Not Determined

16. OTHER INFORMATION

Related Product Codes	LIMHYD0800, LIMHYD0900, LIMHYD1000, LIMHYD1001, LIMHYD1002, LIMHYD1003, LIMHYD1100, LIMHYD1200, LIMHYD1300, LIMHYD1605, LIMHYD1606, LIMHYD1640, LIMHYD1645, LIMHYD1700, LIMHYD1701, LIMHYD1720, LIMHYD1722, LIMHYD1724, LIMHYD1725, LIMHYD1727, LIMHYD1730, LIMHYD1740, LIMHYD1750, LIMHYD1800,

LIMHYD2001, LIMHYD2300, LIMHYD4000, LIMHYD4005, LIMHYD4100, LIMHYD4102, LIMHYD4103, LIMHYD4105, LIMHYD4110, LIMHYD4115, LIMHYD4300, LIMHYD4310, LIMHYD4500, LIMHYD8000, LIMHYD8001, LIMHYD8002, LIMHYD8003, LIMHYD8005, LIMHYD8010, LIMHYD8015, LIMHYD8020

Revision	8
Revision Date	17 Aug 2020
Reason for Issue	Updated SDS
Key/Legend	< Less Than > Greater Than **AICS** Australian Inventory of Chemical Substances **atm** Atmosphere **CAS** Chemical Abstracts Service (Registry Number) **cm^2** Square Centimetres **CO2** Carbon Dioxide **COD** Chemical Oxygen Demand **deg C (°C)** Degrees Celcius **EPA (New Zealand)** Environmental Protection Authority of New Zealand **deg F (°F)** Degrees Farenheit **g** Grams **g/cm^3** Grams per Cubic Centimetre **g/l** Grams per Litre **HSNO** Hazardous Substance and New Organism **IDLH** Immediately Dangerous to Life and Health **immiscible** Liquids are insoluable in each other. **inHg** Inch of Mercury **inH2O** Inch of Water **K** Kelvin **kg** Kilogram **kg/m^3** Kilograms per Cubic Metre **lb** Pound **LC50** LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours. **LD50** LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals. **ltr** or **L** Litre **m^3** Cubic Metre **mbar** Millibar **mg** Milligram **mg/24H** Milligrams per 24 Hours **mg/kg** Milligrams per Kilogram **mg/m^3** Milligrams per Cubic Metre **Misc** or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present. **mm** Millimetre **mmH2O** Millimetres of Water **mPa.s** Millipascals per Second **N/A** Not Applicable **NIOSH** National Institute for Occupational Safety and Health **NOHSC** National Occupational Heath and Safety Commission **OECD** Organisation for Economic Co-operation and Development **Oz** Ounce **PEL** Permissible Exposure Limit **Pa** Pascal **ppb** Parts per Billion **ppm** Parts per Million **ppm/2h** Parts per Million per 2 Hours **ppm/6h** Parts per Million per 6 Hours **psi** Pounds per Square Inch **R** Rankine **RCP** Reciprocal Calculation Procedure **STEL** Short Term Exposure Limit **TLV** Threshold Limit Value **tne** Tonne **TWA** Time Weighted Average **ug/24H** Micrograms per 24 Hours

UN United Nations
wt Weight

1. IDENTIFICATION

Product Name	**Hydrogen peroxide, 20-60% Solution**
Other Names	No Data Available
Uses	Used as an oxidant in bleaching paper pulp, cotton, cotton/synthetic blends and wool fabrics. Used in wastewater and sewage treatment plants to reduce sulphide corrosion and odours and to supply supplemental dissolved oxygen.
Chemical Family	No Data Available
Chemical Formula	Unspecified
Chemical Name	Hydrogen peroxide, aqueous solution
Product Description	Aqueous solution, clear.

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia	+60-3-5614-2111

Emergency Contact Details

For emergencies only; DO NOT contact these companies for general product advice.

Organisation	Location	Telephone
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust)	Schedule 6

Globally Harmonised System

Hazard Classification

Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

Hazard Categories

Oxidising Liquids - Category 2

Acute Toxicity (Oral) - Category 4

Acute Toxicity (Inhalation) - Category 4

Skin Corrosion/Irritation - Category 1B

Serious Eye Damage/Irritation - Category 1

Specific Target Organ Toxicity (Single Exposure) - Category 3

Acute Hazard To The Aquatic Environment - Category 2

Pictograms

Signal Word

Danger

Hazard Statements

H272	May intensify fire; oxidizer.
H302 + H332	Harmful if swallowed or if inhaled.
H314	Causes severe skin burns and eye damage.
H335	May cause respiratory irritation.
H401	Toxic to aquatic life.

Precautionary Statements

Prevention	**P210**	Keep away from heat.
	P221	Take any precaution to avoid mixing with combustibles/organic material.
	P260	Do not breathe mist/vapour/spray.
	P280	Wear protective gloves/protective clothing/eye protection/face protection.
	P273	Avoid release to the environment.
	P270	Do not eat, drink or smoke when using this product.
	P271	Use only outdoors or in a well-ventilated area.
Response	**P370 + P378**	In case of fire: Use water for extinction.
	P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
	P310	Immediately call a POISON CENTER or doctor.
	P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
	P363	Wash contaminated clothing before reuse.
	P391	Collect spillage.
	P304 + P340	IF INHALED: Remove victim to fresh air and keep comfortable for breathing.
Storage	**P403 + P233**	Store in a well-ventilated place. Keep container tightly closed.
	P405	Store locked up.
Disposal	**P501**	Dispose of contents/container in accordance with local / regional / national / international regulations.

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Environmental Protection Authority (New Zealand)
Hazardous Substances and New Organisms Amendment Act 2015

HSNO Classifications	Physical Hazards	**5.1.1B**	Oxidising substances that are liquids or solids: medium hazard
	Health Hazards	**6.1D**	Substances that are acutely toxic - Harmful
		6.9B	Substances that are harmful to human target organs or systems
		8.2B	Substances that are corrosive to dermal tissue UN PGII
		8.3A	Substances that are corrosive to ocular tissue
	Environmental Hazards	**9.1D**	Substances that are slightly harmful to the aquatic environment or are otherwise designed for biocidal action
		9.3C	Substances that are harmful to terrestrial vertebrates

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Water	H2O	7732-18-5	40 - 80 %
Hydrogen peroxide	H2O2	7722-84-1	20 - 60 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed	IF SWALLOWED: Rinse mouth and immediately give a glass of water to drink. Do NOT induce vomiting. Do not administer activated charcoal. Immediately call a Poison Centre or doctor/physician for advise. Urgent hospital treatment is likely to be needed. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Never give anything by mouth to an unconscious person. *Aspiration hazard due to potential foam formation. There is a risk of pulmonary edema! Release of oxygen with potential gas embolism.
Eye	IF IN EYES: Immediately flush eyes with running water for several minutes, holding eyelids open and occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do. Continue flushing until advised to stop by a Poisons Information Centre or a doctor, or for at least 15 minutes. Get medical attention immediately. DANGER: Possible loss of eyesight!
Skin	IF ON SKIN (or hair): Remove contaminated clothing and shoes immediately. Flush skin and hair with running water for at least 15 minutes. Immediately call a Poison Centre or doctor/physician for advise. Wash contaminated clothing and shoes before reuse. If skin irritation occurs, get medical advice/attention. *Possible formation of white spots/patches on exposed skin.
Inhaled	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a Poison Centre or doctor/physician for advise. Apply resuscitation if victim is not breathing - Do not use direct mouth-to-mouth method if victim ingested or inhaled the substance; use alternative respiratory method or proper respiratory device - Administer oxygen if breathing is difficult.
Advice to Doctor	Do not leave affected persons unattended. Keep victim calm and warm - Obtain immediate medical care. Ensure that attending medical personnel are aware of identity and nature of the product(s) involved, and take precautions to protect themselves. Health injuries may be delayed. No information available.

Medical Conditions Aggravated by Exposure	

5. FIRE FIGHTING MEASURES

General Measures	Evacuate personnel to safe areas; Keep unauthorised/unprotected personnel away. Keep upwind and to higher ground. If safe to do so, move undamaged containers from fire area. Do not move cargo if cargo has been exposed to heat. Hydrogen peroxide in the proximity of an ongoing fire must be diluted with large volumes of water. Cool containers with water spray until well after fire is out - If impossible, withdraw from area and let fire burn. Use water spray to knock down vapours or divert vapour clouds. Dam fire control water for later disposal.
Flammability Conditions	OXIDISING SUBSTANCE: The product itself does not burn; However, will accelerate burning when involved in a fire. Product is fire-stimulating.
Extinguishing Media	In case of fires involving substantial quantities of Hydrogen peroxide, use flooding quantities of water for extinction - Do NOT use organic compounds, i.e. dry chemicals, Carbon dioxide (CO2) or foam. For fires involving small amounts of Hydrogen peroxide, use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Fire and Explosion Hazard	Risk of violent reaction or explosion! May explode from heating, shock, friction or contamination. May ignite combustibles. Drying of product on clothing or combustible materials, such as paper, fabrics, leather or wood may cause fire. Mixtures of Hydrogen peroxide with flammable liquids (solvents) may possess explosive properties. Containers may explode when heated. Runoff may create fire or explosion hazard.
Hazardous Products of Combustion	Decomposition products in case of thermal decomposition: water vapour, oxygen.
Special Fire Fighting Instructions	Contain runoff from fire control or dilution water - Runoff may create fire or explosion hazard and may pollute waterways. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. *Should concentrated solutions of hydrogen peroxide enter the sewage system, a spontaneous and explosive decomposition must be expected.
Personal Protective Equipment	Liquid-tight chemical protective clothing (splash suit) in combination with self-contained breathing apparatus (SCBA) should be used. Structural firefighter's uniform will provide limited protection.
Flash Point	Does not flash
Lower Explosion Limit	Hydrogen peroxide vapours (by weight): >40 %
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	2P

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Ensure adequate ventilation. Prevent exposure to heat. ELIMINATE all ignition sources. Do not contaminate - Keep combustibles (wood, paper, clothing, oil, etc.) away from spilled material.
Clean Up Procedures	Large spill: Collect (pump) product into suitable containers using appropriate equipment or use a non-combustible material (e.g. vermiculite, sand or earth) to soak up the product and place it in suitable, labelled containers for disposal (see SECTION 13). Small spill: Dilute product with lots of water and rinse away. - Do NOT seal defective containers or waste receptacles air-tight (danger of bursting due to product decomposition). NEVER return spilled product into original container for reuse (risk of decomposition).
Containment	Stop leak if safe to do so - Prevent entry into waterways, drains or confined areas. Isolate defective containers immediately and place into a plastic waste recepticle. Use water spray to knock down vapours or divert vapour clouds.
Decontamination	Rinse away residues with plenty of water - Dilute with large amounts of water to a concentration of about 5% Hydrogen peroxide; hold in diked area or pond until peroxide is completely decomposed or dispose of according to local regulations. Clean contaminated surface thoroughly. - Combustible materials exposed to Hydrogen peroxide should be immediately submerged in or rinsed with large amounts of water to ensure all Hydrogen peroxide is removed. Residual Hydrogen peroxide that is allowed to dry on organic materials (such as wood, paper, clothing, etc.) can cause the material to ignite. Spillages and decontamination runoff may be washed to drains with large quantities of water. Due care must be

Environmental Precautionary Measures	exercised to avoid unnecessary pollution of watercourses.
Evacuation Criteria	Spill or leak area should be isolated immediately. Keep unauthorised personnel away. Keep upwind and to higher ground. In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.
Personal Precautionary Measures	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing (see SECTION 8).

7. HANDLING AND STORAGE

Handling	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation - Use only outdoors or in a well-ventilated area. Handle in accordance with good industrial hygiene and safety practice. Do not breathe mist/vapours/spray and prevent contact with eyes, skin and clothing. Use personal protective equipment as required (see SECTION 8); Remove contaminated clothing immediately and rinse with large amounts of water. OXIDISING SUBSTANCE: Keep away from heat and sources of ignition - No smoking. Do not contaminate - Take any precaution to avoid mixing with combustibles/organic materials. Never return spilled product into its original container for reuse (risk of decomposition). Prior to first filling or operation of a tank installation, all parts of the facility, including all pipes, must be thoroughly cleaned and flushed through. Metal elements of the installation must first be pickled and passivated sufficiently. Avoid release to the environment.
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep/store container in upright position only and closed to avoid leakage when not in use. Do not confine product in un-vented vessels or between closed valves - Risk of over-pressure and bursting due to decomposition in confined spaces and pipes. Keep away from heat and sources of ignition - No smoking. Keep/store away from combustible/flammable substances. Keep away from organic and incompatible materials (see SECTION 10). Store locked up. - Maximum storage temperature: <= 40 °C.
Container	Keep only in the original container or containers specifically permitted for Hydrogen peroxide, i.e. Stainless steel, 1.4571 or 1.4541, passivated; aluminium, min. 99.5% passivated; aluminium magnesium alloys, passivated; polyethylene, polypropylene, polyvinyl chloride (PVC); polytetrafluoroethylene; glass, ceramics. Do not store in Iron, Mild steel, Copper, Bronze, Brass, Zinc, Tin. Use adequate venting devices on all packages, containers and tanks; check correct operation periodically. Packages, containers and tanks should be regularly checked for any signs of abnormality, e.g. corrosion, bulging, temperature increase, etc.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	COMPONENT: Hydrogen peroxide (CAS No. 7722-84-1): - Safe Work Australia Exposure Standard: TWA = 1 ppm (1.4 mg/m3). - New Zealand WES: TWA = 1 ppm (1.4 mg/m3). - NIOSH REL/OSHA PEL: TWA = 1 ppm (1.4 mg/m3). - Immediately dangerous to life or health (IDLH) concentration: 75 ppm.
Exposure Limits	No Data Available
Biological Limits	No information available.
Engineering Measures	A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area.
Personal Protection Equipment	- Respiratory protection: Wear respiratory protection in case of inadequate ventilation and/or large amounts are released and workplace exposure limit may be exceeded. Recommended: Filter type SA - supplied air. - Eye/face protection: Wear appropriate eye protection to prevent eye contact. Recommended: Chemical splash goggles and face-shield. - Hand protection: Wear protective gloves. Recommended: Impermeable gloves, e.g. Butyl rubber (0.7 mm), Break through time: >480 min; Natural rubber/NR (1 mm), Break through time: <120 min; Nitrile (0.33 mm), Break through time: <33 min. A hazard assessment should be conducted prior to use to ensure suitability of gloves for specific work environments and processes prior to use. - Skin/body protection: Wear appropriate personal protective clothing to prevent skin contact. Recommended: Acid-proof protective clothing, e.g. PVC, neoprene, nitrile rubber, rubber; Full chemical splash suit (PVC); Rubber or plastic boots. To identify additional PPE requirements, it is recommended that a hazard assessment be conducted before using this

	product.
Special Hazards Precaustions	Avoid protective gloves, clothes and shoes made from Leather. Completely submerge Hydrogen peroxide contaminated clothing or other materials in water prior to drying. Residual Hydrogen peroxide, if allowed to dry on materials such as paper, fabrics, cotton, leather, wood or other combustibles, can cause the material to ignite.
Work Hygienic Practices	Do not eat, drink or smoke when using this product. Wash face and hands before breaks and end of work. Remove contaminated clothing and shoes immediately and rinse with large amounts of water.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid
Appearance	Liquid
Odour	Stinging
Colour	Colourless
pH	>1 - 4
Vapour Pressure	2.99 hPa (Hydrogen peroxide, 100%) (@ 25 °C)
Relative Vapour Density	No Data Available
Boiling Point	approx. 114 °C
Melting Point	-52.2 °C
Freezing Point	No Data Available
Solubility	Miscible with water
Specific Gravity	1.1914
Flash Point	Does not flash
Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	No Data Available
Density	1.196 g/cm3
Specific Heat	No Data Available
Molecular Weight	34.02 g/mol
Net Propellant Weight	No Data Available
Octanol Water Coefficient	log Pow: -1.57 (Hydrogen peroxide, 100%)
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	1.17 mPa.s (@ 20 °C)
Volatile Percent	No Data Available
VOC Volume	No Data Available
Additional Characteristics	Surface tension: approx. 75.68 mN/m (20 °C).
Potential for Dust Explosion	Not applicable.
Fast or Intensely Burning Characteristics	Risk of violent reaction or explosion! May explode from heating, shock, friction or contamination.
Flame Propagation or Burning Rate of Solid Materials	No information available.
Non-Flammables That Could Contribute Unusual Hazards to a Fire	May ignite combustibles/organic materials. Drying of product on clothing or combustible materials, such as paper, fabrics, leather or wood may cause fire.

Properties That May Initiate or Contribute to Fire Intensity	OXIDISING SUBSTANCE: The product itself does not burn; However, will accelerate burning when involved in a fire. Product is fire-stimulating.
Reactions That Release Gases or Vapours	Decomposition products in case of thermal decomposition: water vapour, oxygen.
Release of Invisible Flammable Vapours and Gases	Mixtures of Hydrogen peroxide with flammable liquids (solvents) may possess explosive properties.

10. STABILITY AND REACTIVITY

General Information	Product is a(n) oxidizing agent and reactive. Decomposition hazard in case of temperature/heat exposure, contaminations or contact with incompatible materials. Risk of overpressure and burst due to decomposition in confined spaces and pipes. Release of oxygen may support combustion.
Chemical Stability	Stable under recommended storage conditions. Product is supplied in stabilised form. Commercial products are stabilised to reduce risk of decomposition due to contamination.
Conditions to Avoid	Avoid exposure to sun rays, heat, heat effect.
Materials to Avoid	Incompatible/reactive with impurities, decomposition catalysts, metals, metal salts, alkaline substances, hydrochloric acid, reduction agents, inflammable substances, organic solvents.
Hazardous Decomposition Products	Decomposition products in case of thermal decomposition: water vapour, oxygen.
Hazardous Polymerisation	Hazardous polymerisation does not occur. *When coming in contact with the product, impurities, decomposition catalysts, incompatible substances, combustible substances, may lead to self-accelerated, exothermic decomposition and the formation of oxygen.

11. TOXICOLOGICAL INFORMATION

General Information	- Acute toxicity: Harmful if swallowed or if inhaled. Symptoms such as drowsiness, irritation of the esophagus, burning sensation behind the breast bone (retrosternal burning, heartburn), foaming at the mouth, nausea, vomiting and diarrhea are possible. - Skin corrosion/irritation: Causes skin irritation. The formation of white spots/patches on skin exposed is possible. - Eye damage/irritation: Causes serious eye damage. Depending on the intensity of exposure irritating/corrosive liquids cause injuries, destruction and detachment of connective tissue and corneal epithelium, corneal opacity, edemas and ulceration to a variable degree. Possible loss of eyesight. - Respiratory/skin sensitisation: Not a skin sensitizer (Guinea Pig). - Germ cell mutagenicity: In vitro - positive and negative (literature). In vivo - negative (hydrogen peroxide, 35 %). - Carcinogenicity: Up to date there is no evidence of increased tumour risk. Hydrogen peroxide is not a carcinogenic substance according to MAK, IARC, NTP, OSHA, ACGIH. - Reproductive toxicity: No information available. - STOT (single exposure): May cause respiratory irritation. Signs of irritation affecting the respiratory tract such as coughing, burning sensations behind the breast bone (sternum), watering eyes, burning sensations of eyes or nose, necrosis formation in upper respiratory tract as well as shortness of breath (dyspnea) are possible. - STOT (repeated exposure): No information available. - Aspiration toxicity: Based on available data, the classification criteria are not met. Aspiration hazard due to potential foam formation.

Acute

Ingestion	Acute toxicity (Oral): - LD50, Rat: 1,193 mg/kg (male) & 1,270 mg/kg (female).
Other	Acute toxicity (Dermal): - LD50, Rabbit (male/female): >2,000 mg/kg (analogous).
Inhalation	Acute toxicity (Inhalation): - Acute toxicity estimate (ATE): 4.16 mg/l dust/mists/fume; 30.56 mg/l vapour.
Carcinogen Category	None

12. ECOLOGICAL INFORMATION

Ecotoxicity	COMPONENT: Hydrogen peroxide: - EC50 microorganisms (activated sludge): 466 mg/l (0.5 h) [OECD 209]. - EC50 microorganisms (activated sludge): >1,000 mg/l (3 h) [OECD 209]. - NOEC, algae/aquatic plant (Skeletonema costatum): 0.63 mg/l (72 h).
Persistence/Degradability	Readily biodegradable (Hydrogen peroxide). Hydrogen peroxide quickly decomposes to oxygen and water.
Mobility	No information available.
Environmental Fate	Toxic to aquatic life - Avoid release to the environment.
Bioaccumulation Potential	Log Kow: -1,57 20 °C (QSAR) (pure substance).
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of contents/container in accordance with local/regional/national regulations. Pack and store waste like the pure substance and apply the label according to the contents for disposal. Offer surplus and non-recyclable solutions to a licensed disposal company. Taking into account local regulations, small amounts of the product may be disposed of as waste water after neutralisation.
Special Precautions for Land Fill	Rinse empty containers before disposal; recommended cleaning agent: water. Offer rinsed packaging material to local recycling facilities. Do not reuse empty containers and dispose of in accordance with the regulations issued by the appropriate local authorities.

14. TRANSPORT INFORMATION

Land Transport (Australia)

ADG Code

Proper Shipping Name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilised as necessary)
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	8 Corrosive Substances
EPG	31 Oxidizing Substances
UN Number	2014
Hazchem	2P
Pack Group	II
Special Provision	No Data Available

Land Transport (French Polynesia)

Proper Shipping Name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	8 Corrosive Substances
EPG	31 Oxidizing Substances
UN Number	2014

Hazchem	2P
Pack Group	II
Special Provision	No Data Available

Land Transport (Indonesia)

Proper Shipping Name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	8 Corrosive Substances
EPG	31 Oxidizing Substances
UN Number	2014
Hazchem	2P
Pack Group	II
Special Provision	No Data Available

Land Transport (Malaysia)
ADR Code

Proper Shipping Name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	8 Corrosive Substances
EPG	31 Oxidizing Substances
UN Number	2014
Hazchem	2P
Pack Group	II
Special Provision	No Data Available

Land Transport (New Zealand)
NZS5433

Proper Shipping Name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	8 Corrosive Substances
EPG	31 Oxidizing Substances
UN Number	2014
Hazchem	2P
Pack Group	II
Special Provision	No Data Available

Land Transport (United States of America)
US DOT

Proper Shipping Name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	8 Corrosive Substances
ERG	140 Oxidizers
UN Number	2014
Hazchem	2P

Pack Group	II
Special Provision	No Data Available

Sea Transport
IMDG Code

Proper Shipping Name	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilised as necessary)
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	8 Corrosive Substances
UN Number	2014
Hazchem	2P
Pack Group	II
Special Provision	No Data Available
EMS	F-H, S-Q
Marine Pollutant	Yes

Air Transport
IATA DGR

Proper Shipping Name	Hydrogen peroxide, aqueous solution > 40% and less than 60% hydrogen peroxide, stabilized as necessary
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	8 Corrosive Substances
UN Number	2014
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	FORBIDDEN FOR AIR TRANSPORT

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

15. REGULATORY INFORMATION

General Information	HYDROGEN PEROXIDE
Poisons Schedule (Aust)	Schedule 6

Environmental Protection Authority (New Zealand)
Hazardous Substances and New Organisms Amendment Act 2015

Approval Code	HSR001326

National/Regional Inventories

Australia (AIIC)	Listed

Canada (DSL)	Listed
Canada (NDSL)	Not Determined
China (IECSC)	Listed
Europe (EINECS)	Not Determined
Europe (REACh)	Not Determined
Japan (ENCS/METI)	Not Determined
Korea (KECI)	Listed
Malaysia (EHS Register)	Not Determined
New Zealand (NZIoC)	Listed
Philippines (PICCS)	Listed
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined
Taiwan (NCSR)	Not Determined
USA (TSCA)	Listed

16. OTHER INFORMATION

Related Product Codes

HYPERA1000, HYPERA2000, HYPERA2001, HYPERA2500, HYPERA2600, HYPERA3000, HYPERA3400, HYPERA3500, HYPERA3600, HYPERB5000, HYPERB5001, HYPERB5050, HYPERB5100, HYPERB6000, HYPERB6001, HYPERB6002, HYPERC1000, HYPERC9900, HYPERD3500, HYPERD4900, HYPERD5000, HYPERD5001, HYPERD5002, HYPERD5003, HYPERD5004, HYPERD5005, HYPERD5006, HYPERD5007, HYPERD5008, HYPERD5009, HYPERD5100, HYPERD5101, HYPERD5200, HYPERD5201, HYPERD5500, HYPERD5501, HYPERD5502, HYPERD5503, HYPERD5504, HYPERD5505, HYPERD5506, HYPERD5507, HYPERD5508, HYPERD6000, HYPERD6001, HYPERD6003, HYPERD6100, HYPERD6200, HYPERD6400, HYPERD7000, HYPERD7001, HYPERD7150, HYPERD7200, HYPERD9000, HYPERE1000, HYPERE3500, HYPERE5000, HYPERE5001, HYPERE5500, HYPERF1000, HYPERF1500, HYPERF5000, HYPERF5500, HYPERF5501, HYPERL1800, HYPERL1900, HYPERL2000, HYPERL2600, HYPERL2700, HYPERL2701, HYPERL2750, HYPERL2800, HYPERL2900, HYPERL3000, HYPERL3500, HYPERL3501, HYPERL3502, HYPERL3503, HYPERL3504, HYPERL3505, HYPERL3506, HYPERL3507, HYPERO0003, HYPERO0400, HYPERO0500, HYPERO0501, HYPERO1000, HYPERO1001, HYPERO1002, HYPERO1003, HYPERO1004, HYPERO1005, HYPERO1006, HYPERO1007, HYPERO1008, HYPERO1009, HYPERO1010, HYPERO1011, HYPERO1012, HYPERO1013, HYPERO1014, HYPERO1015, HYPERO1016, HYPERO1017, HYPERO1018, HYPERO1019, HYPERO1020, HYPERO1021, HYPERO1022, HYPERO1023, HYPERO1024, HYPERO1025, HYPERO1026, HYPERO1027, HYPERO1028, HYPERO1029, HYPERO1030, HYPERO1031, HYPERO1032, HYPERO1033, HYPERO1034, HYPERO1500, HYPERO1800, HYPERO1801, HYPERO1802, HYPERO1803, HYPERO1804, HYPERO1805, HYPERO1806, HYPERO1807, HYPERO1808, HYPERO1809, HYPERO1810, HYPERO1811, HYPERO1812, HYPERO1813, HYPERO1814, HYPERO1815, HYPERO1816, HYPERO1817, HYPERO1818, HYPERO1819, HYPERO1820, HYPERO1821, HYPERO1822, HYPERO1823, HYPERO1824, HYPERO1825, HYPERO1826, HYPERO1827, HYPERO1828, HYPERO1829, HYPERO1830, HYPERO1831, HYPERO1832, HYPERO1833, HYPERO1834, HYPERO1835, HYPERO1836, HYPERO1837, HYPERO1838, HYPERO1839, HYPERO1840, HYPERO1841, HYPERO1842, HYPERO1843, HYPERO1844, HYPERO1845, HYPERO1846, HYPERO1847, HYPERO1848, HYPERO1849, HYPERO1850, HYPERO1851, HYPERO1852, HYPERO1853, HYPERO1854, HYPERO1855, HYPERO1856, HYPERO2000, HYPERO2001, HYPERO2025, HYPERO2026, HYPERO2027, HYPERO2030, HYPERO2050, HYPERO2055, HYPERO2056, HYPERO2200, HYPERO2500, HYPERO3000, HYPERO3500, HYPERO4000, HYPERO4304, HYPERO4305, HYPERO5000, HYPERO5001, HYPERO5002, HYPERO5003, HYPERO5004, HYPERO5005, HYPERO5006, HYPERO5007, HYPERO5008, HYPERO5009, HYPERO5010, HYPERO5100, HYPERO5500, HYPERO6000, HYPERO6003, HYPERO6005, HYPERO6006, HYPERO6007, HYPERO6060, HYPERO6200, HYPERO7000, HYPERO7100, HYPERO7200, HYPERO8010, HYPERO9506, HYPERT0115, HYPERT2000, HYPERT2001, HYPERT2020, HYPERT3500, HYPERT4000, HYPERT4100, HYPERT4500, HYPERT4900, HYPERT5000, HYPERT5001, HYPERT5100,

HYPERT5200, HYPERT5300, HYPERT5400, HYPERT5500, HYPERT5600, HYPERT5700, HYPERT5800, HYPERT5900, HYPERT6000, HYPERT6001, HYPERT6002, HYPERT6003, HYPERT6004, HYPERT6100, HYPERT6200, HYPERT6201, HYPERT6202, HYPERT6203, HYPERT6204, HYPERT6205, HYPERT6206, HYPERT6207, HYPERT6208, HYPERT6209, HYPERT6210, HYPERT6500, HYPERT6501, HYPERT7000, HYPERT8207, HYPERV5000, HYPERV6000

Revision 4

Revision Date 04 Nov 2020

Reason for Issue SDS updated

Key/Legend

< Less Than
> Greater Than
AICS Australian Inventory of Chemical Substances
atm Atmosphere
CAS Chemical Abstracts Service (Registry Number)
cm^2 Square Centimetres
CO2 Carbon Dioxide
COD Chemical Oxygen Demand
deg C (°C) Degrees Celcius
EPA (New Zealand) Environmental Protection Authority of New Zealand
deg F (°F) Degrees Farenheit
g Grams
g/cm^3 Grams per Cubic Centimetre
g/l Grams per Litre
HSNO Hazardous Substance and New Organism
IDLH Immediately Dangerous to Life and Health
immiscible Liquids are insoluable in each other.
inHg Inch of Mercury
inH2O Inch of Water
K Kelvin
kg Kilogram
kg/m^3 Kilograms per Cubic Metre
lb Pound
LC50 LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.
LD50 LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.
ltr or **L** Litre
m^3 Cubic Metre
mbar Millibar
mg Milligram
mg/24H Milligrams per 24 Hours
mg/kg Milligrams per Kilogram
mg/m^3 Milligrams per Cubic Metre
Misc or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present.
mm Millimetre
mmH2O Millimetres of Water
mPa.s Millipascals per Second
N/A Not Applicable
NIOSH National Institute for Occupational Safety and Health
NOHSC National Occupational Heath and Safety Commission
OECD Organisation for Economic Co-operation and Development
Oz Ounce
PEL Permissible Exposure Limit
Pa Pascal
ppb Parts per Billion
ppm Parts per Million
ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average

ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight

SAFETY DATA SHEET
SULPHURIC ACID (15-51%)
REVISION 4, DATE 30 APR 2024

1. IDENTIFICATION

Product Name	**Sulphuric acid (15-51%)**
Other Names	Battery fluid, acid; SULPHURIC ACID with not more than 51% acid; Sulphuric acid, 50%
Uses	Industrial use.
Chemical Family	No Data Available
Chemical Formula	H2SO4
Chemical Name	Sulphuric acid, aqueous solution
Product Description	No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia	+60-3-5614-2111

Emergency Contact Details

For emergencies only; DO NOT contact these companies for general product advice.

Organisation	Location	Telephone
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust)	Schedule 6

Globally Harmonised System

Hazard Classification			Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)
Hazard Categories			Corrosive to Metals - Category 1
			Skin Corrosion/Irritation - Category 1A
			Serious Eye Damage/Irritation - Category 1
			Specific Target Organ Toxicity (Single Exposure) - Category 3
Pictograms			
Signal Word			Danger
Hazard Statements		**H290**	May be corrosive to metals.
		H314	Causes severe skin burns and eye damage.
		H335	May cause respiratory irritation.
Precautionary Statements	Prevention	**P260**	Do not breathe mist/vapour/spray.
		P271	Use only outdoors or in a well-ventilated area.
		P280	Wear protective gloves/protective clothing/eye protection/face protection and suitable respirator.
	Response	**P303 + P361 + P353**	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
		P310	Immediately call a POISON CENTER or doctor.
		P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
		P390	Absorb spillage to prevent material-damage.
		P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
		P363	Wash contaminated clothing before reuse.
		P304 + P340	IF INHALED: Remove victim to fresh air and keep comfortable for breathing.
	Storage	**P403 + P233**	Store in a well-ventilated place. Keep container tightly closed.
		P406	Store in corrosive resistant container with a resistant inner liner.
		P405	Store locked up.
	Disposal	**P501**	Dispose of contents/container in accordance with local / regional / national / international regulations.

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Safe Work Australia

National Guide for Classifying Hazardous Chemicals under the Model WHS Regulations

Hazard Classification	Hazardous according to the criteria of Safe Work Australia under Model WHS Regulations

Environmental Protection Authority (New Zealand)
Hazardous Substances and New Organisms Amendment Act 2015

HSNO Classifications	Health Hazards	**6.7A**	Substances that are known or presumed human carcinogens

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Sulphuric acid	H2SO4	7664-93-9	>=15 - <=51 %
Water	H2O	7732-18-5	Balance %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed	IF SWALLOWED: Rinse mouth, then drink plenty of water. Do NOT induce vomiting. For advice, contact a Poisons Information Centre (e.g. phone Australia 13 11 26; New Zealand 0800 764 766) or a doctor. Never give anything by mouth to an unconscious person.
Eye	IF IN EYES: Do not rub affected area! Immediately flush eyes with running water for several minutes, holding eyelids open and occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do. Continue flushing until advised to stop by a Poisons Information Centre (e.g. phone Australia 13 11 26; New Zealand 0800 764 766) or a doctor, or for at least 15 minutes.
Skin	IF ON SKIN (or hair): Remove and isolate contaminated clothing and shoes. Immediately flush skin and hair with running water for at least 15 minutes. Immediately call a Poison Centre or doctor/physician for advice. Wash contaminated clothing and shoes before reuse. *For minor skin contact, avoid spreading material on unaffected skin.
Inhaled	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a Poison Centre or doctor/physician for advice. Give artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult.
Advice to Doctor	Treat symptomatically. Keep victim calm and warm. Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. *Most important symptoms and effects, both acute and delayed: Causes severe skin burns and eye damage. May cause respiratory irritation. Inhaled corrosive substances can lead to a toxic oedema of the lungs.
Medical Conditions Aggravated by Exposure	No information available.

5. FIRE FIGHTING MEASURES

General Measures	Move containers from fire area if you can do it without risk. Cool containers with water spray until well after fire is out. Dike fire-control water for later disposal; do not scatter the material. Do not get water inside containers. *Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire.
Flammability Conditions	Non-combustible; substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
Extinguishing Media	If material is involved in a fire, use dry chemical, Carbon dioxide (CO2), foam or water spray for extinction. Use water spray or fog; do not use straight streams.

	*Reaction with water or moist air may release toxic, corrosive or flammable gases. Reaction with water may generate much heat that will increase the concentration of fumes in the air.
Fire and Explosion Hazard	Risk of violent reaction or explosion! Vapours may accumulate in confined areas. Substance may react with water, releasing corrosive and/or toxic gases and runoff. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated or if contaminated with water.
Hazardous Products of Combustion	Fire will produce irritating, corrosive and/or toxic gases, including Sulphur oxides.
Special Fire Fighting Instructions	Contain runoff from fire control or dilution water - Runoff may be corrosive and/or toxic and cause pollution. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Personal Protective Equipment	Wear positive pressure self-contained breathing apparatus (SCBA). Wear chemical protective clothing - It may provide little or no thermal protection. Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
Flash Point	No Data Available
Lower Explosion Limit	No Data Available
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	2R

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Ensure adequate ventilation - Ventilate enclosed spaces before entering. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Do not breathe mist/vapours and prevent contact with eyes, skin and clothing.
Clean Up Procedures	Cover with DRY earth, DRY sand or other non-combustible material. Use clean, non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal (see SECTION 13). *DO NOT GET WATER INSIDE CONTAINERS.
Containment	Stop leak if you can do it without risk. Prevent entry into waterways, sewers, basements or confined areas. *A vapour-suppressing foam may be used to reduce vapours. Use water spray to reduce vapours or divert vapour cloud drift. Avoid allowing water runoff to contact spilled material.
Decontamination	Use neutralizing agents, e.g. Sodium carbonate, sodium bicarbonate, sodium hydroxide. After cleaning, flush away traces with water.
Environmental Precautionary Measures	Prevent entry into drains and waterways. Local authorities should be advised if significant spillages cannot be contained.
Evacuation Criteria	Spill or leak area should be isolated immediately. Evacuate personnel to safe areas. Keep unauthorised personnel away. Keep upwind and to higher ground.
Personal Precautionary Measures	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing (see SECTION 8).

7. HANDLING AND STORAGE

Handling	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation - Use only outdoors or in a well-ventilated place. Handle in accordance with good industrial hygiene and safety practice. Do not breathe mist/vapours and prevent contact with eyes, skin and clothing. Do not ingest. Wear protective gloves/protective clothing/eye protection/face protection and suitable respirator (see SECTION 8). CORROSIVE TO METALS: Absorb spillage to prevent material damage (see SECTION 6). Keep away from heat and sources of ignition - No smoking. *When diluting, always add the product to water. Never add water to the product.
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep container tightly closed - Check regularly for leaks. Keep away from heat and sources of ignition - No smoking. Keep away from foodstuffs and incompatible materials (see SECTION 10). Store locked up.
Container	Keep only in the original, properly labelled containers.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	For Sulphuric acid (CAS No. 7664-93-9): - Safe Work Australia Exposure Standard: TWA = 1 mg/m3; STEL = 3 mg/m3 - New Zealand Workplace Exposure Standard [Adopted 2018]: TWA = 0.1 mg/m3; Known or presumed human carcinogen (carcinogen category 1). - NIOSH REL/OSHA PEL: TWA = 1 mg/m3 - Immediately dangerous to life or health (IDLH) concentration: 15 mg/m3
Exposure Limits	No Data Available
Biological Limits	No information available.
Engineering Measures	A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area.
Personal Protection Equipment	- Respiratory protection: Wear respiratory protection in case of inadequate ventilation or if an inhalation risk exists. Recommended: Full facepiece particulate respirator (refer to AS/NZS 1715 & 1716). - Eye/face protection: Wear appropriate eye protection to prevent eye contact. Recommended: Tight sealed safety goggles. If splashes are likely to occur, Face protection shield. - Hand protection: Wear protective gloves. Recommended: Elbow-length, impervious gloves, e.g. Vinyl gloves (excellent protection); Neoprene or Nitrile rubber gloves (good protection). - Skin/body protection: Wear appropriate personal protective clothing to prevent skin contact. Recommended: Acid-resistant protective clothing. Long sleeved clothing; Chemical resistant apron, Overalls; Rubber boots. The type of protective equipment must be selected according to the concentration and amount of the hazardous substance(s) at the specific workplace.
Special Hazards Precaustions	The International Agency for Research on Cancer (IARC) have concluded that occupational exposure to strong inorganic acid mists containing sulfuric acid is carcinogenic to humans, causing cancer of the larynx and to a lesser extent, the lung. Exposure to any mist or aerosol during the use of this product should be avoided and exposure should not exceed the exposure standard.
Work Hygienic Practices	Do not eat, drink or smoke when using this product. Wash hands before breaks and immediately after handling the product. Take off immediately all contaminated clothing. Wash contaminated clothing before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid
Appearance	Liquid
Odour	Odourless
Colour	Colourless to brown
pH	<1
Vapour Pressure	No Data Available
Relative Vapour Density	No Data Available
Boiling Point	127 °C
Melting Point	No Data Available
Freezing Point	No Data Available
Solubility	Miscible with water
Specific Gravity	1.25 - 1.40
Flash Point	No Data Available
Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available

Decomposition Temperature	No Data Available
Density	No Data Available
Specific Heat	No Data Available
Molecular Weight	No Data Available
Net Propellant Weight	No Data Available
Octanol Water Coefficient	No Data Available
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	No Data Available
Volatile Percent	No Data Available
VOC Volume	No Data Available
Additional Characteristics	Strongly hygroscopic.
Potential for Dust Explosion	Not applicable.
Fast or Intensely Burning Characteristics	No information available.
Flame Propagation or Burning Rate of Solid Materials	No information available.
Non-Flammables That Could Contribute Unusual Hazards to a Fire	Reacts exothermically with water which may cause violent spattering. Reaction with water may generate much heat that will increase the concentration of fumes in the air.
Properties That May Initiate or Contribute to Fire Intensity	Non-combustible; substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
Reactions That Release Gases or Vapours	Fire will produce irritating, corrosive and/or toxic gases, including Sulphur oxides. Reaction with water or moist air may release toxic, corrosive or flammable gases.
Release of Invisible Flammable Vapours and Gases	Contact with metals may evolve flammable hydrogen gas.

10. STABILITY AND REACTIVITY

General Information	Corrosive to most metals. Reacts exothermically with water.
Chemical Stability	Stable under normal conditions.
Conditions to Avoid	To avoid thermal decomposition, do not overheat. Avoid contact with water/moisture.
Materials to Avoid	Incompatible/reactive with water, oxidising agents, alkalis, most metals, organic chemicals.
Hazardous Decomposition Products	Fire will produce irritating, corrosive and/or toxic gases, including Sulphur oxides. Reaction with water or moist air may release toxic, corrosive or flammable gases. Contact with metals may evolve flammable hydrogen gas.
Hazardous Polymerisation	Will not occur.

11. TOXICOLOGICAL INFORMATION

General Information	Information on toxicological effects: - Acute toxicity: Not classified. The effects of sulfuric acid following inhalation are entirely due to local irritation of the respiratory tract, thus classification for acute inhalational toxicity is not recommended despite low median lethal concentrations (LC50s). There is no evidence for the systemic toxicity of sulfuric acid in any study as effects are limited to the site of contact. The main macroscopic and/or microscopic alterations observed in the respiratory tract after acute exposure to sulfuric acid aerosol are haemorrhage, oedema, atelectasis (partial collapse or incomplete inflation of the lung) and thickening of the alveolar wall in the lung of guinea pigs, haemorrhage and oedema of the lungs and/or

ulceration of the turbinate, trachea and larynx in rats and mice. These lesions are related to the corrosive/irritant effect of sulfuric acid.
- Skin corrosion/irritation: Causes severe skin burns and eye damage.
- Serious eye damage/irritation: Causes serious eye damage.
- Respiratory/skin sensitisation: Not classified.
- Germ cell mutagenicity: Not classified.
- Carcinogenicity: Not classified. Strong-inorganic-acid mists containing sulfuric acid (CAS No. 7664-93-9): IARC Group 1 "Carcinogenic to humans".
- Reproductive toxicity: Not classified.
- STOT (single exposure): May cause respiratory irritation.
- STOT (repeated exposure): Not classified.
- Aspiration toxicity: Not classified.

Information on likely routes of exposure:
- Ingestion: Corrosive! Causes severe burns.
- Eye contact: Causes serious eye damage.
- Skin contact: Causes severe skin burns.
- Inhalation: May cause respiratory irritation. Inhaled corrosive substances can lead to a toxic oedema of the lungs.
Chronic effects: Repeated overexposure may lead to chronic conjunctivitis, lung damage and dental erosion. The International Agency for Research on Cancer (IARC) have concluded that occupational exposure to strong inorganic acid mists containing sulfuric acid is carcinogenic to humans, causing cancer of the larynx and to a lesser extent, the lung. No direct link has been established with sulfuric acid, itself, and cancer in humans. Exposure to any mist or aerosol during the use of this product should be avoided and exposure should not exceed the exposure standard.

Acute

Ingestion

Acute toxicity (Oral):
COMPONENT: Sulfuric acid (CAS No. 7664-93-9):
- LD50, Rats: 2,140 mg/kg bw. [NICNAS].

Carcinogen Category None

12. ECOLOGICAL INFORMATION

Ecotoxicity	No information available.
Persistence/Degradability	No information available.
Mobility	No information available.
Environmental Fate	High concentration in receiving water will injure aquatic life by pH effect. Keep out of waterways.
Bioaccumulation Potential	No information available.
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of contents/container in accordance with local/regional/national regulations.
Special Precautions for Land Fill	Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal. Container remains hazardous when empty. Continue to observe all precautions.

14. TRANSPORT INFORMATION

Land Transport (Australia)
ADG Code

Proper Shipping Name	SULPHURIC ACID with not more than 51% acid
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	2796
Hazchem	2R
Pack Group	II
Special Provision	No Data Available

Land Transport (Malaysia)
ADR Code

Proper Shipping Name	SULPHURIC ACID with not more than 51% acid
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	2796
Hazchem	2R
Pack Group	II
Special Provision	No Data Available

Land Transport (New Zealand)
NZS5433

Proper Shipping Name	SULPHURIC ACID with not more than 51% acid
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	2796
Hazchem	2R
Pack Group	II
Special Provision	No Data Available

Land Transport (United States of America)
US DOT

Proper Shipping Name	SULPHURIC ACID with not more than 51% acid
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
ERG	157 Substances - Toxic and/or Corrosive (Non-Combustible / Water-Sensitive)
UN Number	2796
Hazchem	2R
Pack Group	II
Special Provision	No Data Available

Sea Transport
IMDG Code

Proper Shipping Name	SULPHURIC ACID with not more than 51% acid

Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	2796
Hazchem	2R
Pack Group	II
Special Provision	No Data Available
EMS	F-A, S-B
Marine Pollutant	No

Air Transport
IATA DGR

Proper Shipping Name	SULPHURIC ACID with not more than 51% acid
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	2796
Hazchem	2R
Pack Group	II
Special Provision	No Data Available

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

15. REGULATORY INFORMATION

General Information	SULFURIC ACID
Poisons Schedule (Aust)	Schedule 6

Environmental Protection Authority (New Zealand)
Hazardous Substances and New Organisms Amendment Act 2015

Approval Code	HSR001572

National/Regional Inventories

Australia (AIIC)	Listed
Canada (DSL)	Listed
Canada (NDSL)	Not Determined
China (IECSC)	Listed
Europe (EINECS)	Listed
Europe (REACh)	Not Determined

Japan (ENCS/METI)	Listed
Korea (KECI)	Listed
Malaysia (EHS Register)	Not Determined
New Zealand (NZIoC)	Listed
Philippines (PICCS)	Listed
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined
Taiwan (NCSR)	Listed
USA (TSCA)	Listed

Additional Information ABBREVIATIONS: SAR = supplied-air respirator SCBA = self-contained breathing apparatus IDLH = Immediately Dangerous to Life or Health.

16. OTHER INFORMATION

Related Product Codes SULACC1200, SULACC1300, SULACC2000, SULACC2001, SULACC2100, SULACC3500, SULACC5400, SULACD1400, SULACD1500, SULACD1501, SULACD1502, SULACD2600, SULACD2700, SULACD5400, SULACD5401, SULACD5402, SULACI1007, SULACI1200, SULACI1201, SULACI1400, SULACI1401, SULACI1500, SULACI1501, SULACI1550, SULACI1781, SULACI1804, SULACI1805, SULACI1806, SULACI1807, SULACI1808, SULACI1809, SULACI1810, SULACI1811, SULACI1812, SULACI1813, SULACI1814, SULACI1815, SULACI1816, SULACI1817, SULACI1818, SULACI1822, SULACI1823, SULACI1824, SULACI1848, SULACI1849, SULACI1850, SULACI1851, SULACI1857, SULACI1873, SULACI1874, SULACI1875, SULACI1876, SULACI1877, SULACI1878, SULACI1879, SULACI1880, SULACI1881, SULACI1882, SULACI1883, SULACI1884, SULACI1885, SULACI1886, SULACI1887, SULACI1888, SULACI1889, SULACI1892, SULACI1893, SULACI1894, SULACI1895, SULACI1901, SULACI1902, SULACI1903, SULACI1904, SULACI1906, SULACI1907, SULACI1908, SULACI1909, SULACI1910, SULACI1911, SULACI1912, SULACI1913, SULACI1914, SULACI1915, SULACI1916, SULACI1922, SULACI1923, SULACI1930, SULACI1939, SULACI1940, SULACI1941, SULACI1943, SULACI1964, SULACI1965, SULACI1966, SULACI1967, SULACI1968, SULACI1969, SULACI1970, SULACI1971, SULACI1979, SULACI1980, SULACI1983, SULACI1984, SULACI1991, SULACI1992, SULACI1996, SULACI1998, SULACI1999, SULACI2004, SULACI2005, SULACI2006, SULACI2008, SULACI2014, SULACI2017, SULACI2018, SULACI2024, SULACI2025, SULACI2026, SULACI2035, SULACI2036, SULACI2046, SULACI2047, SULACI2054, SULACI2060, SULACI2061, SULACI2062, SULACI2064, SULACI2066, SULACI2081, SULACI2251, SULACI2666, SULACI2700, SULACI2800, SULACI2851, SULACI3500, SULACI3501, SULACI3502, SULACI3503, SULACI3601, SULACI3602, SULACI3608, SULACI3610, SULACI4100, SULACI5000, SULACI5100, SULACI7500, SULACI7510, SULACI7520, SULACI8200

Revision 4

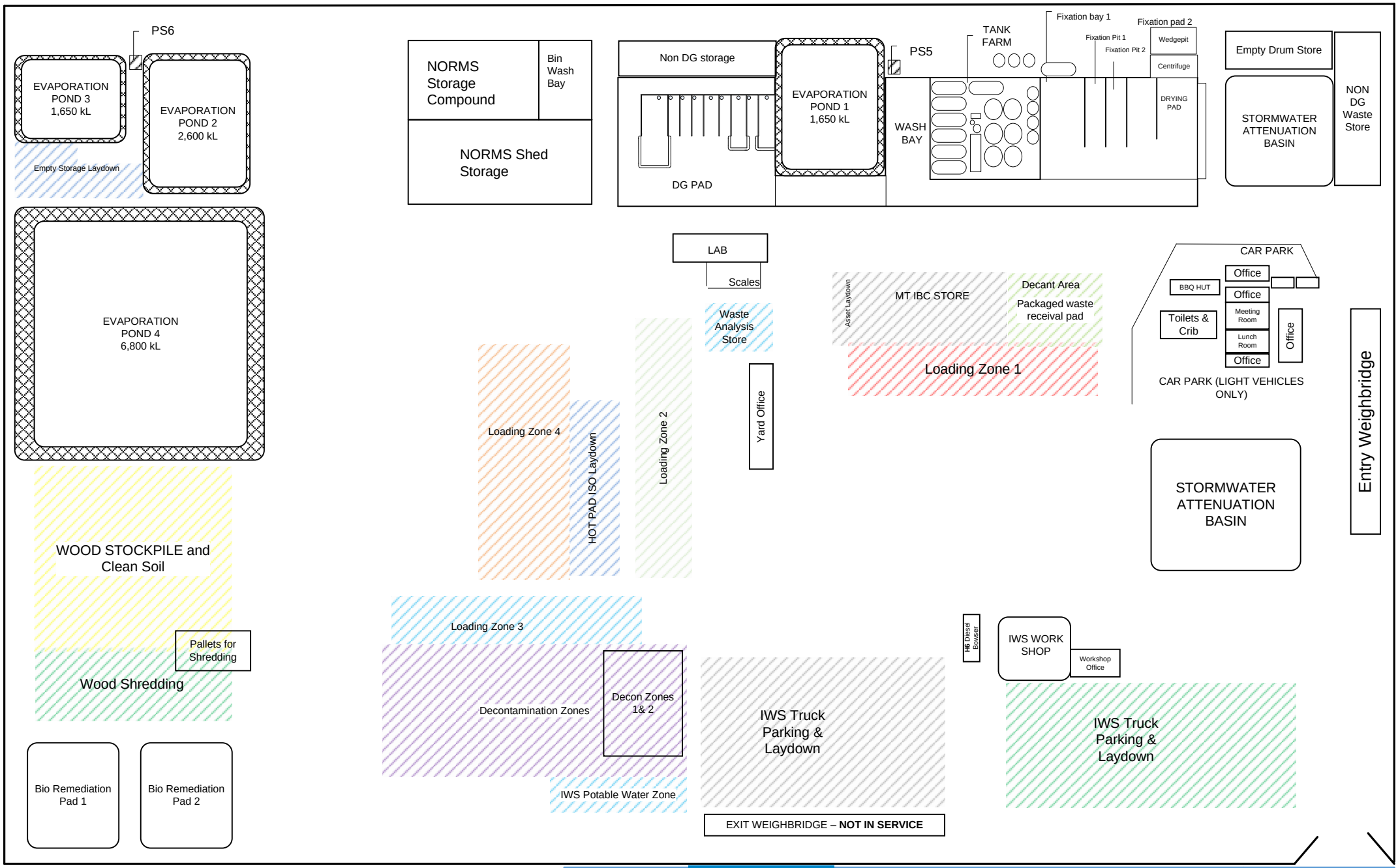
Revision Date 30 Apr 2024

Key/Legend

< Less Than
> Greater Than
AICS Australian Inventory of Chemical Substances
atm Atmosphere
CAS Chemical Abstracts Service (Registry Number)
cm^2 Square Centimetres
CO2 Carbon Dioxide
COD Chemical Oxygen Demand
deg C (°C) Degrees Celcius
EPA (New Zealand) Environmental Protection Authority of New Zealand
deg F (°F) Degrees Farenheit
g Grams
g/cm^3 Grams per Cubic Centimetre
g/l Grams per Litre
HSNO Hazardous Substance and New Organism
IDLH Immediately Dangerous to Life and Health

immiscible Liquids are insoluable in each other.
inHg Inch of Mercury
inH2O Inch of Water
K Kelvin
kg Kilogram
kg/m^3 Kilograms per Cubic Metre
lb Pound
LC50 LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.
LD50 LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.
ltr or **L** Litre
m^3 Cubic Metre
mbar Millibar
mg Milligram
mg/24H Milligrams per 24 Hours
mg/kg Milligrams per Kilogram
mg/m^3 Milligrams per Cubic Metre
Misc or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present.
mm Millimetre
mmH2O Millimetres of Water
mPa.s Millipascals per Second
N/A Not Applicable
NIOSH National Institute for Occupational Safety and Health
NOHSC National Occupational Heath and Safety Commission
OECD Organisation for Economic Co-operation and Development
Oz Ounce
PEL Permissible Exposure Limit
Pa Pascal
ppb Parts per Billion
ppm Parts per Million
ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average
ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight

Attachment 8B: Premises layout plan



N

CLEANAWAY

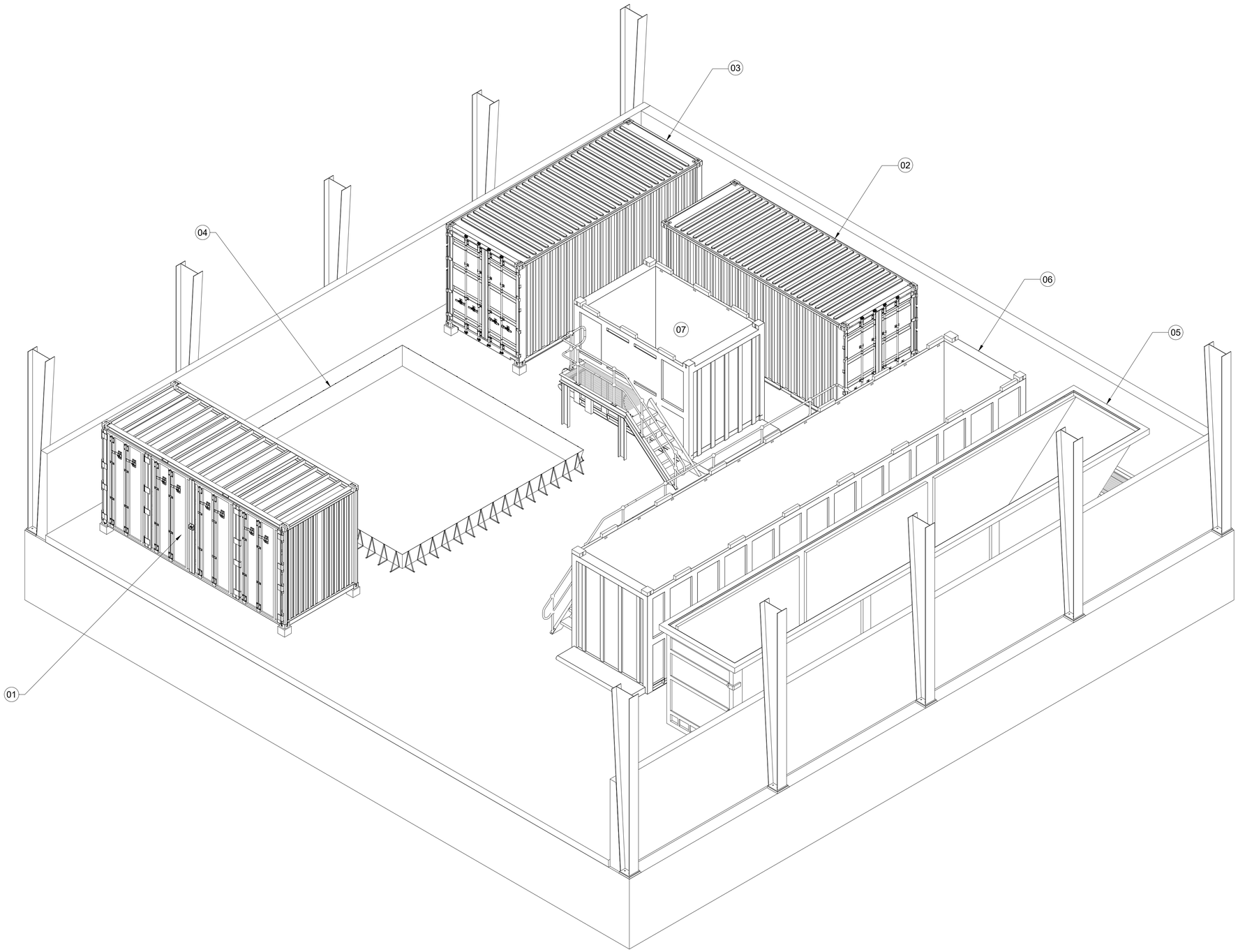
Cleanaway Karratha (LTS)
Lot 126 North West Coastal Highway (Tom Price Road) KARRATHA WA 6714

18/09/2024
A3
Updated by [redacted]

Attachment 8C: Decontamination zone general layout plans

INITIAL DRAFT

EQUIPMENT LIST	
S.NO.	DESCRIPTION
1	SCF DG STORAGE
2	FILTRATION & PUMP SKID
3	WASTE WATER SKID
4	CHEMICAL CIRCULATION AREA
5	LARGE MOBILE WASH BAY
6	LARGE MOBILE CHEMICAL BATH
7	SMALL MOBILE CHEMICAL BATH



ISOMETRIC VIEW

SCALE 1:50

(ROOF HIDDEN FOR CLARITY)

NOTES:

1. FOR GENERAL ARRANGEMENT PLAN VIEW, REFER DRAWING NO: KAD-GA-002.
2. FOR GENERAL ARRANGEMENT ELEVATION & SECTION VIEW, REFER DRAWING NO: KAD-GA-003.

CLEANAWAY

DRAWING APPROVAL	REV	DATE	BY	DESCRIPTION	CK	AP
NAME:						
DATE:						
REV:						
SIGNATURE:						

PROJECT DETAILS: KARRATHA DECONTAMINATION LAYOUT

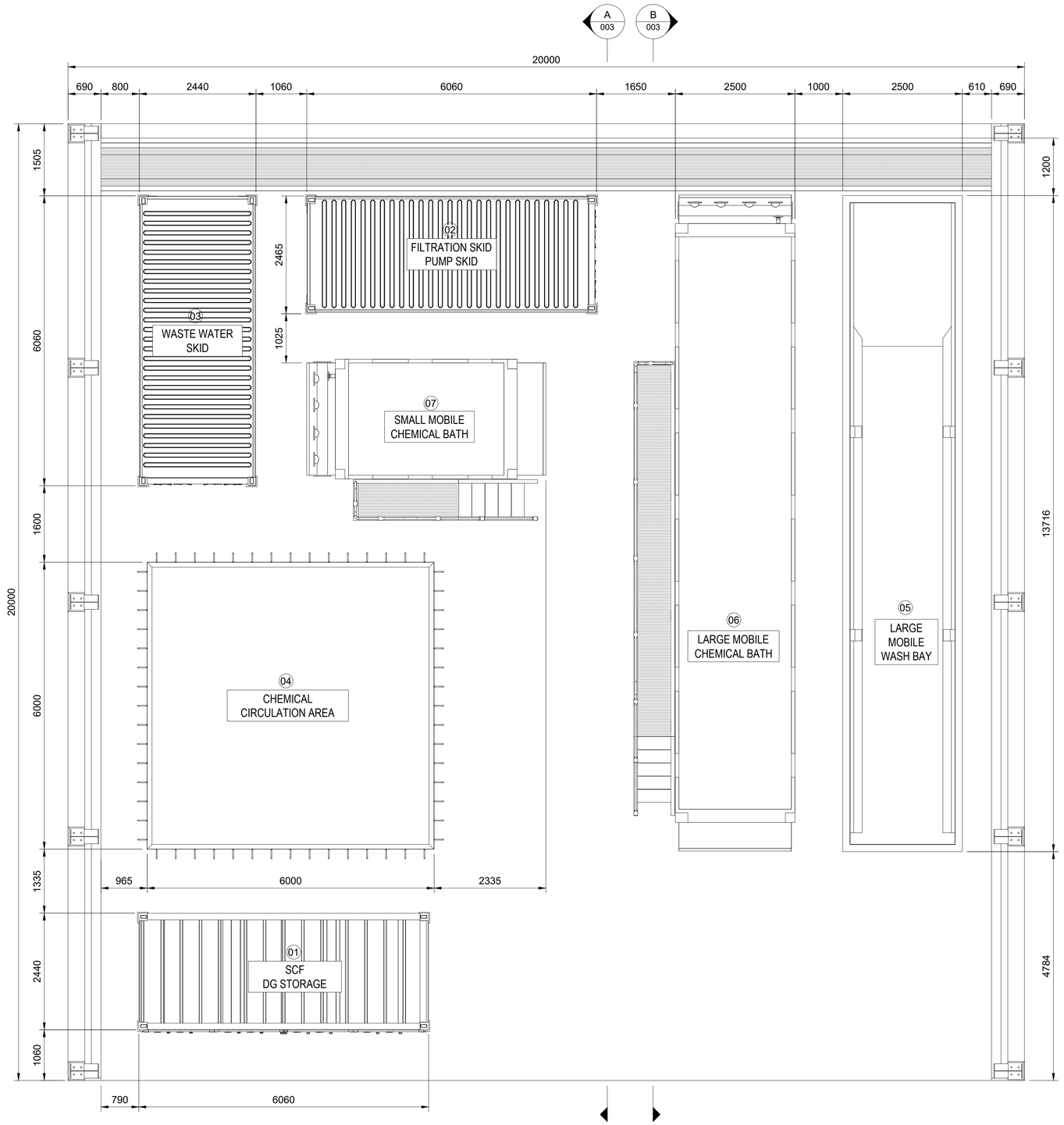
DRAWING NUMBER: KAD-GA-001

DRAWING TITLE: GENERAL ARRANGEMENT ISOMETRIC VIEW

STATUS: INITIAL DRAFT

DATE:	SCALE:	SHEET:
17-10-2024	1:50	1 OF 1

INITIAL DRAFT



PLAN

SCALE 1:50

NOTES:

1. ALL DIMENSIONS ARE IN mm UNLESS SPECIFIED OTHERWISE.
2. FOR GENERAL ARRANGEMENT ISOMETRIC VIEW, REFER DRAWING NO: KAD-GA-001.
3. FOR GENERAL ARRANGEMENT ELEVATION & SECTION VIEW, REFER DRAWING NO: KAD-GA-003.

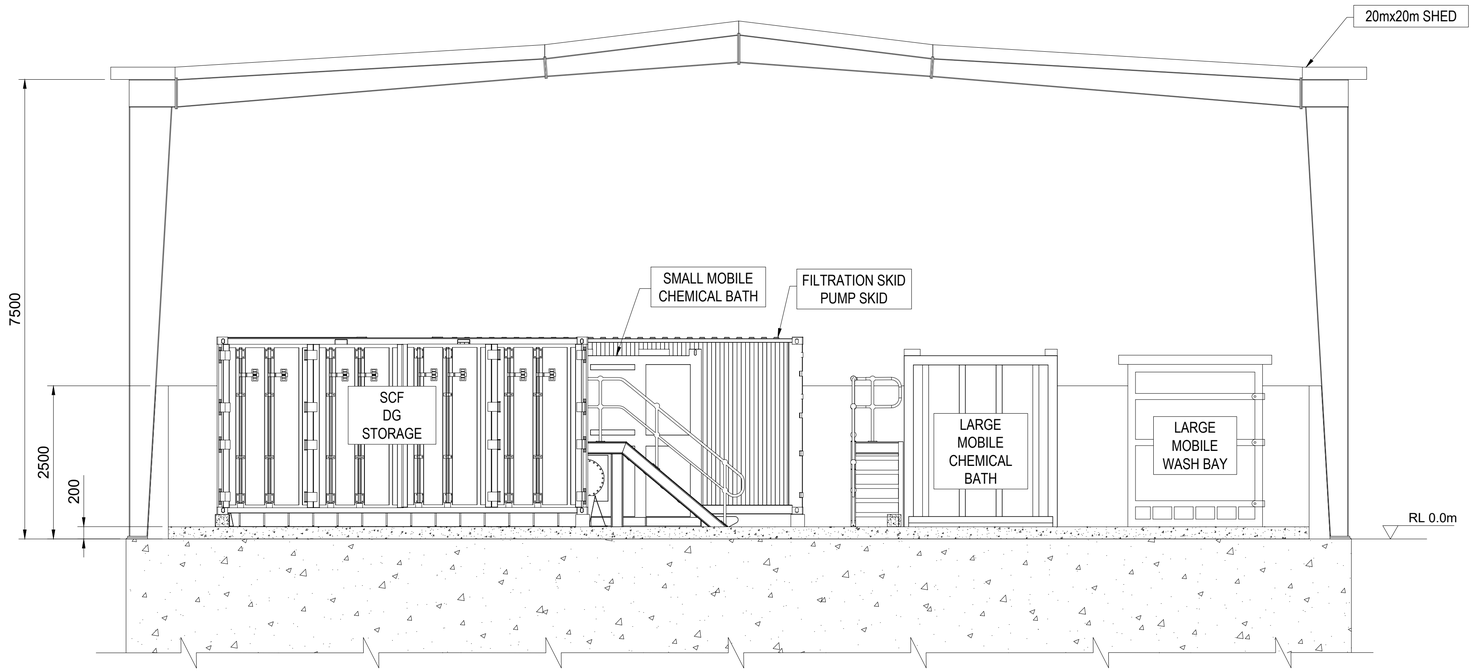
CLEANAWAY

DRAWING APPROVAL	REV	DATE	BY	DESCRIPTION	CK	AP
NAME:						
DATE:						
REV:						
SIGNATURE:						

PROJECT DETAILS	DRAWING TITLE	STATUS
KARRATHA DECONTAMINATION LAYOUT	GENERAL ARRANGEMENT PLAN VIEW	INITIAL DRAFT

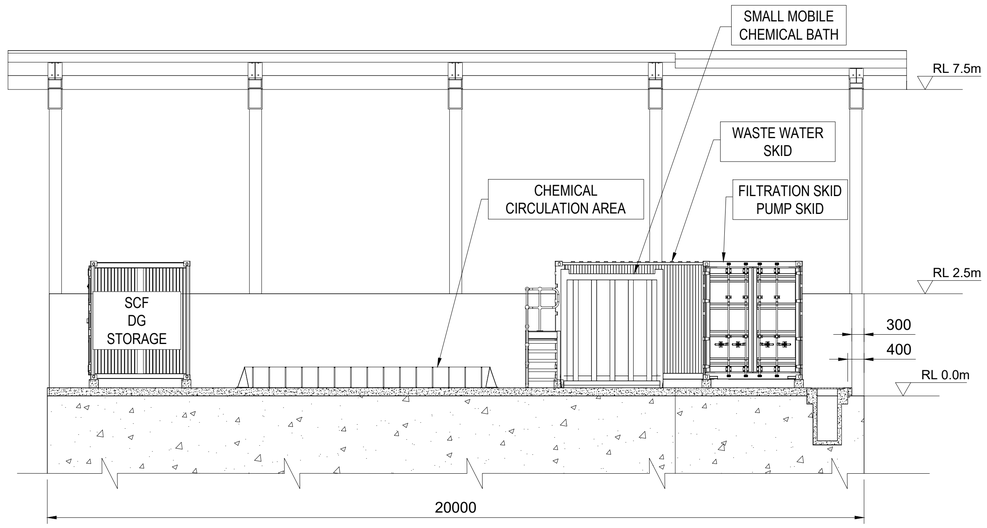
DRAWING NUMBER:	DATE:	SCALE:	SHEET:
KAD-GA-002	17-10-2024	1:50	1 OF 1

INITIAL DRAFT



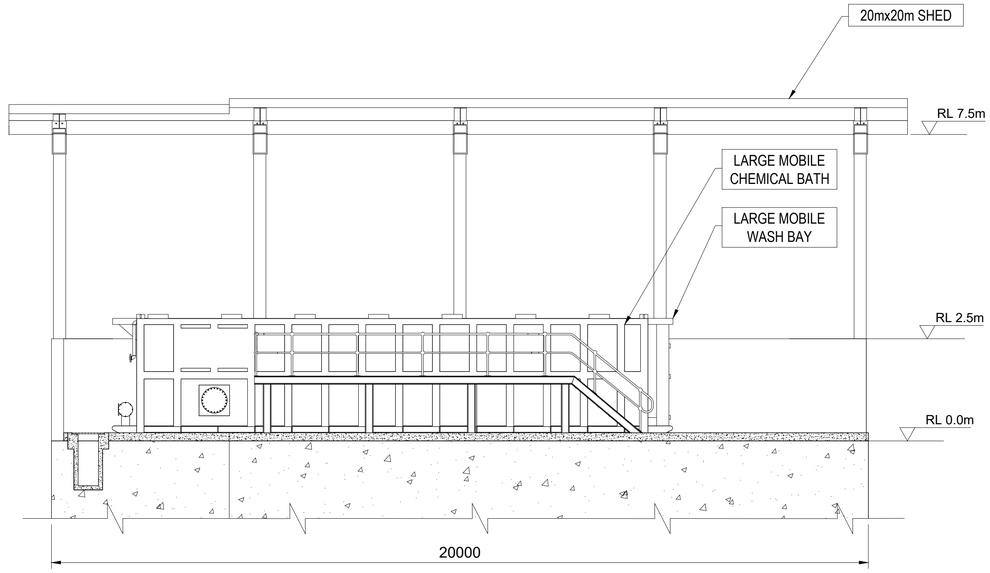
ELEVATION

SCALE 1:50



A 002 SECTION

SCALE 1 : 75



B 002 SECTION

SCALE 1 : 75

NOTES:

1. ALL DIMENSIONS ARE IN mm UNLESS SPECIFIED OTHERWISE.
2. FOR GENERAL ARRANGEMENT ISOMETRIC VIEW, REFER DRAWING NO: KAD-GA-001.
3. FOR GENERAL ARRANGEMENT PLAN, REFER DRAWING NO: KAD-GA-002.

CLEANAWAY

DRAWING APPROVAL	REV	DATE	BY	DESCRIPTION	CK	AP
NAME:						
DATE:						
REV:						
SIGNATURE:						

PROJECT DETAILS: KARRATHA DECONTAMINATION LAYOUT

DRAWING NUMBER: KAD-GA-003

DRAWING TITLE: GENERAL ARRANGEMENT ELEVATION & SECTION VIEWS

STATUS: INITIAL DRAFT

DATE:	SCALE:	SHEET:
17-10-2024	1:75 1:50	1 OF 1

Attachment 8D: Bund capacity assessment (decontamination)

Chemical Bath Bunding

Items Requiring Bunding

Description	Volume (using dimensions stated)	110% Volume	Height
Large Bath	57.10 kL	62.81 kL	1.80 m
Small Bath	21.96 kL	24.16 kL	1.80 m
Total Volume	79.06 kL		
25% Total	20 kL		

Assumptions made:

- Bund depth consistent across whole area
- Assumes square bund
- Collapsible bund not required in work area
- Bund loss due to ladders is insignificant
- DG storage container is self bunded and can be removed from shed

Lost Area (equipment on ground)

Description	Volume	Length	Width
Large Bath (13x2.44)	31.72 m^2	13.00 m	2.44 m
Small Bath (5x2.44)	12.20 m^2	5.00 m	2.44 m
HPWJ Booth (12.2x2.44)	29.77 m^2	12.20 m	2.44 m
20ft Filter Skid (6.1x2.44)	14.88 m^2	6.10 m	2.44 m
20ft Container Storage (6.1x2.44)	14.88 m^2	6.10 m	2.44 m
	103.46 m^2		

Lost Area (all equipment on 300mm stands)

Description	Volume	Length	Width	Comments
Large Bath (13x2.44)	0.98 m^2	0.40 m	2.44 m	2x .2x2.44 footings/stands
Small Bath (5x2.44)	0.98 m^2	0.40 m	2.44 m	2x .2x2.44 footings/stands
HPWJ Booth (12.2x2.44)	0.98 m^2	0.40 m	2.44 m	2x .2x2.44 footings/stands
20ft Filter Skid (6.1x2.44)	0.98 m^2	0.40 m	2.44 m	2x .2x2.44 footings/stands
20ft Container Storage (6.1x2.44)	0.98 m^2	0.40 m	2.44 m	2x .2x2.44 footings/stands
	4.88 m^2			

Available Area

Description	Volume	Length	Width
Shed	400.00 m^2	20.00 m	20.00 m
Current Bund	83.34 kL	Taken from surveyor	
Average Height	208 mm	Assumes flat bund rather than slope to rear	

Available Bund	61.78 kL	With equipment in current bund

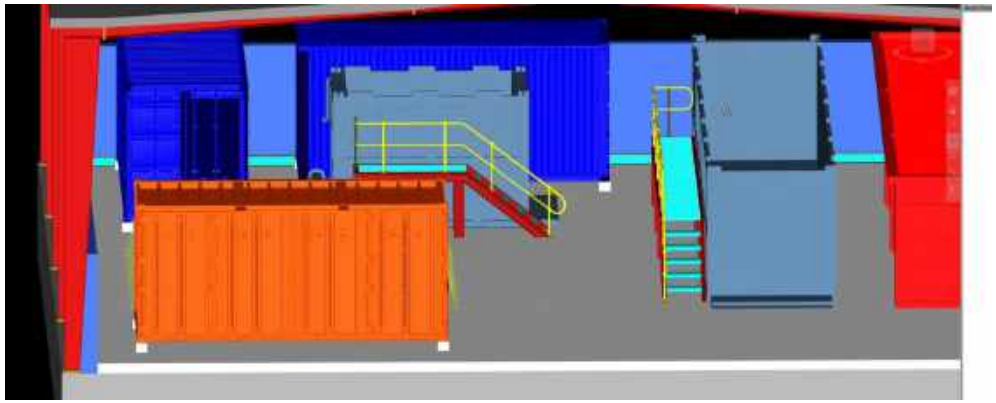
Available Area

Description	Volume	Length	Width
Shed	400.00 m^2	20.00 m	20.00 m
Current Bund	83.34 kL	Taken from surveyor	
Average Height	208 mm	Assumes flat bund rather than slope to rear	

Available Bund	82.32 kL	With equipment in current bund

Conclusion:

- If all equipment is to be placed directly on the ground, the maximum tank volume allowed is 56kL
- However through the use of stands to elevate all containers above the bund, the maximum tank volume is 74kL
- Proposed 57.1kL tank will require at least one container to be on the proposed stands, which would be required anyways to account for slope towards rear of shed
- Any bund used would be subject to the highest standard of controls across class 5.1, 6.1, 7 & 8



Attachment 8E: Centrate tank example specification

SCF

CONTAINER SOLUTIONS

20FT FLOWBACK TANK

The SCF 20ft Flowback tank is a small and mighty solution for your on site water treatment and liquid sediment removal.
This tank has a 31,000 L capacity and is compliant for both road and rail transport allowing quick and easy deployment to almost any location.

Details

Managing on site water treatment has never been easier with our 20ft Flowback Tank.

It is built as an open top tank with a fold down gantry system, allowing operators to safely access the top of the tank and the central weir to treat water.

Our 20ft Flowback Tank has been designed for the purpose of removing suspended solids from water. The internal weirs encourage solids to drop from suspension and settle in the bottom of the tank, thanks to SCF's sediment removal system.

When the hard work is done, multiple drain points and the open top configuration make washing out the tank easy, so you can move on to the next job hassle-free.

Similar to our 40ft Flowback Tank and 45ft Flowback Tank, this tank can be connected in sequence together to allow for further separation and storage.

Key Features

- AS1657 compliant stair and hand rail system
- Inlet fitted with both Camlock and Bauer fittings as standard
- SCF clean flow overflow system fitted as standard
- Built-in weir system to assist in sediment separation
- Drain point at both ends

Options

- Customer co-branding
- Removabe hatches

Specifications

20ft Flowback Tank | FL20S

Specifications may vary

Volume

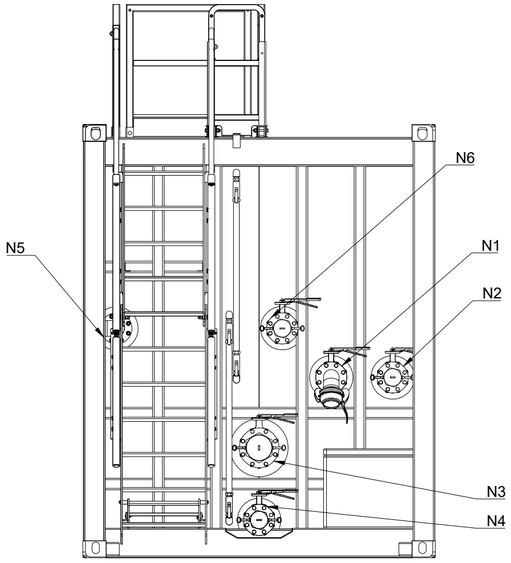
Litres	31,000
m^3	31

External

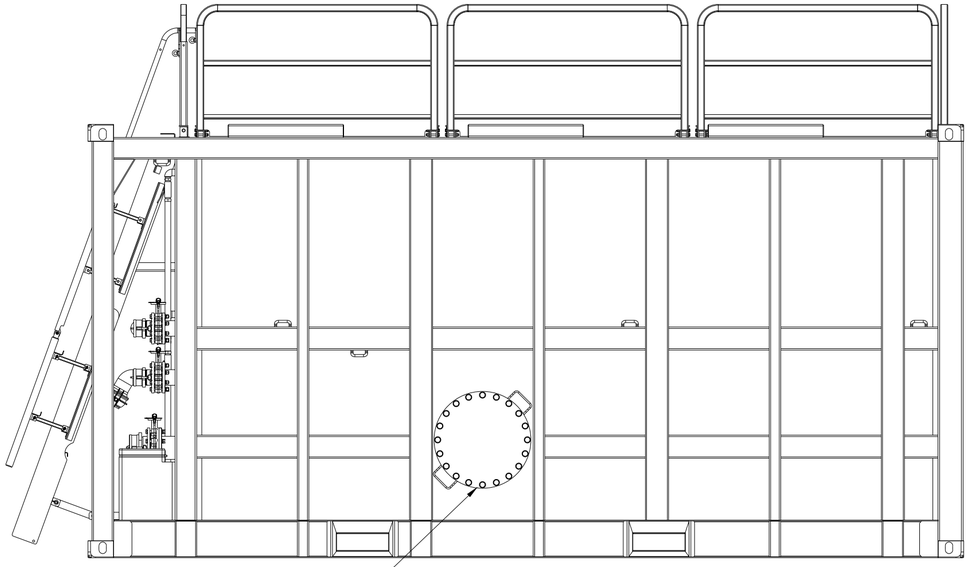
Length (mm)	6,058
Width (mm)	2,438
Height (mm)	2,997

Weight

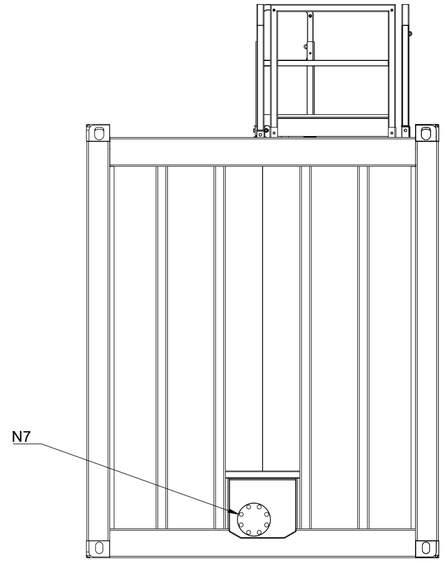
Tare (kg)	6,900



REAR VIEW

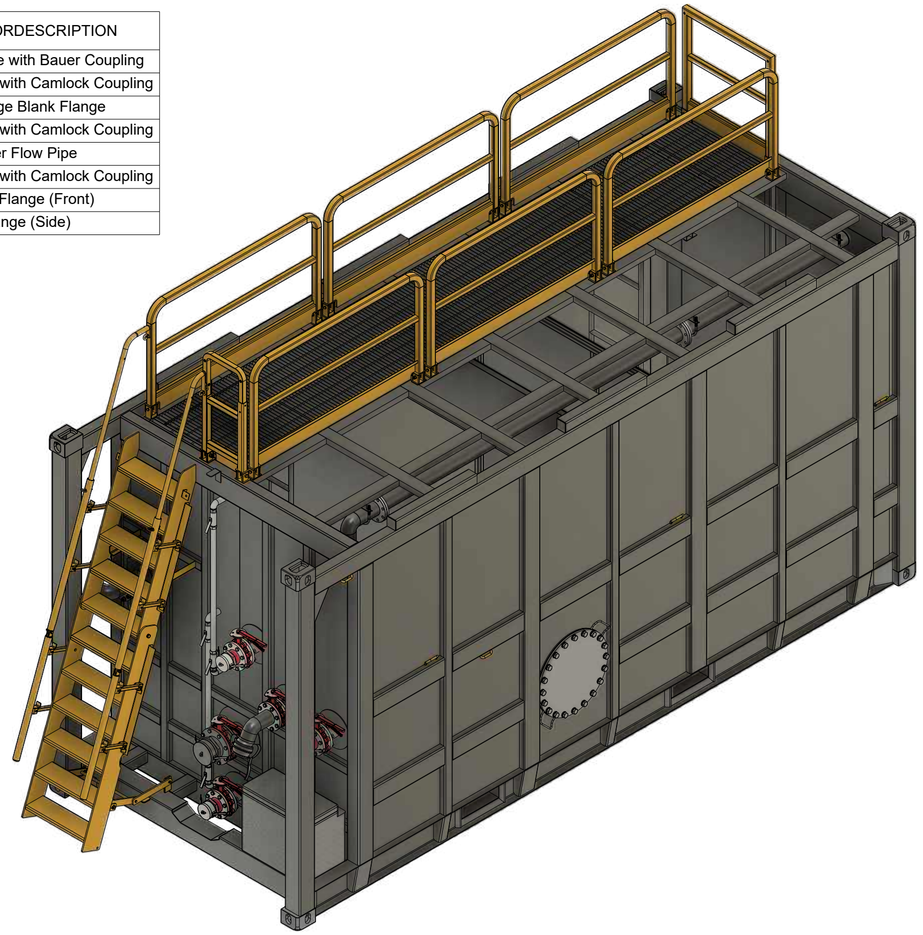


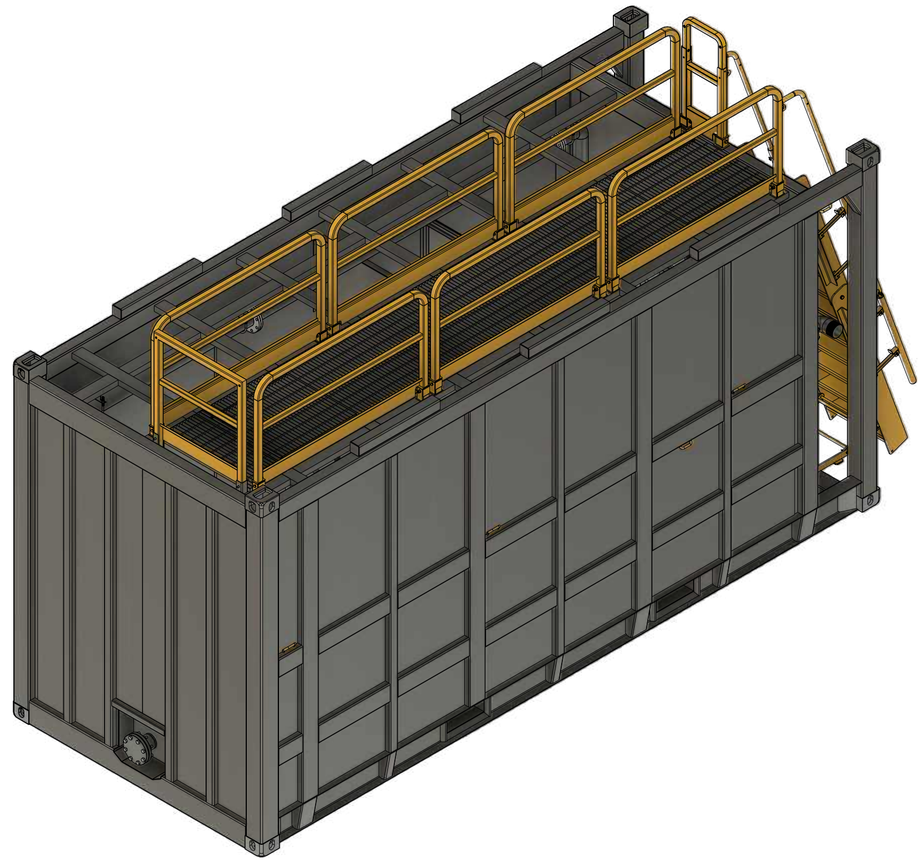
SIDE VIEW



FRONT VIEW

ITEM	NOMINAL SIZE	NOMINAL RATING	TYPE	STANDARD	USAGE ORDESCRIPTION
N1	4"	Class 150	Flange	ANSI B16.5	Butterfly Valve with Bauer Coupling
N2	4"	Class 150	Flange	ANSI B16.5	Butterfly Valve with Camlock Coupling
N3	6"	Class 150	Flange	ANSI B16.5	Discharge Blank Flange
N4	4"	Class 150	Flange	ANSI B16.5	Butterfly Valve with Camlock Coupling
N5	4"	Class 150	Flange	ANSI B16.5	Over Flow Pipe
N6	4"	Class 150	Flange	ANSI B16.5	Butterfly Valve with Camlock Coupling
N7	4"	Class 150	Flange	ANSI B16.5	Blank Flange (Front)
N8	DN500	-	Flange		Flange (Side)





GENERAL DIMENSIONS				
Items		Value	Tol.	Units
Eternal Dimensions	Length	6058	-6	[mm]
	Width	2438	-5	[mm]
	Height	2997	-5	[mm]
Internal Dimensions	Length	5339.5	-6	[mm]
	Width	2320	-5	[mm]
	Height	2623	-5	[mm]
GENERAL DIMENSIONS				
Maximum gross weight		6200		[Kg]
Tare weight		~ 6200		[Kg]
Maximum payload		0		[Kg]
Sacking test load		96012		[Kg]

REV	DESCRIPTION	DRAWN	CHECK	APPROVED	DATE
A	RELEASE FOR REVIEW	RP	KT	JD	15/03/2023
REVISION					

DIMENSION TOLERANCES U.N.O		
0 ~ 5mm	±	0.5
5 ~ 50mm	±	1.0
50 ~ 150mm	±	1.5
150 ~ 500mm	±	2.0
500 ~ 1000mm	±	2.5
1000 ~ 2000mm	±	3.0
2001 ~ 5000mm	±	5.0
>5000mm	±	10.0
ANGULAR	±	0.25°

SCF CONTAINER SOLUTIONS
SCF GROUP
134 Richmond Road, Marleston
ADELAIDE, 5033
SOUTH AUSTRALIA
Tel: +61 8 8208 0900

SCALE

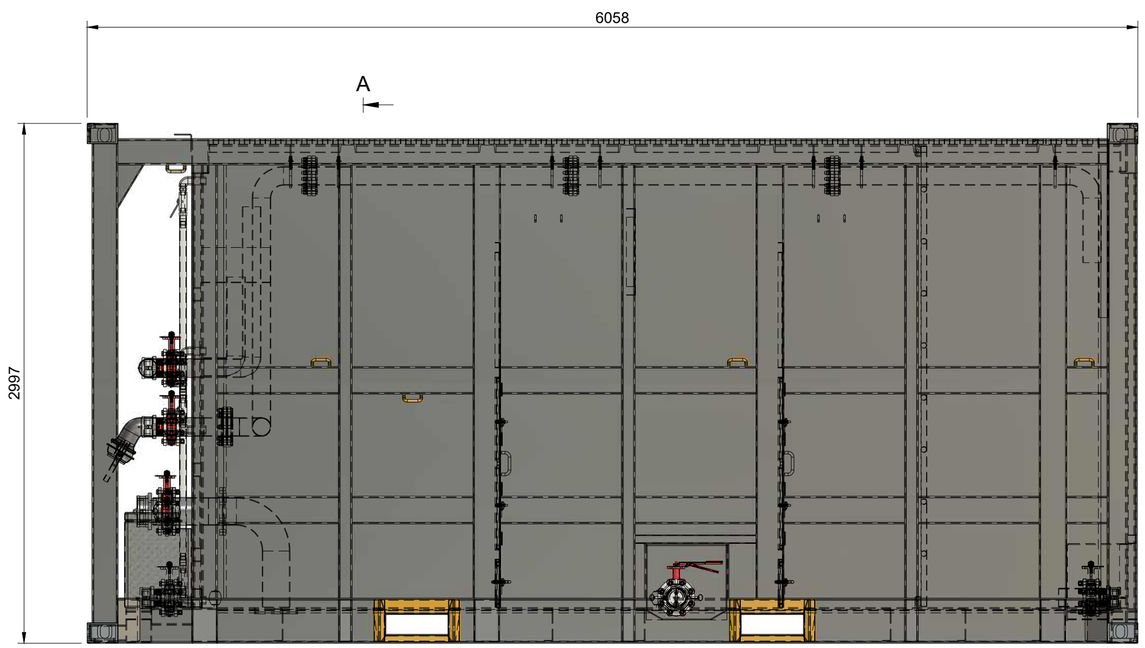
Sheet 1/3

A1

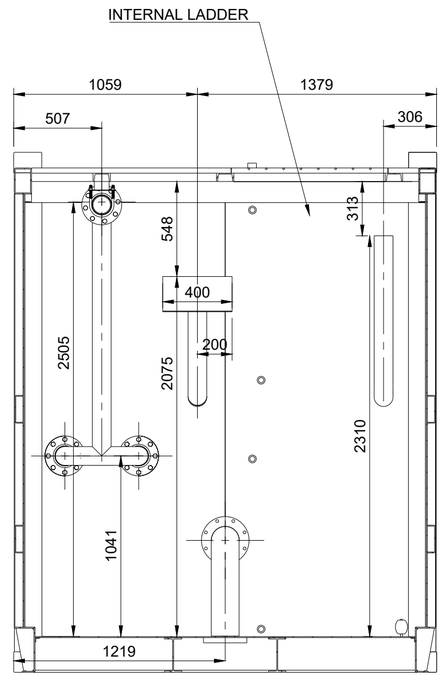
Title
Q200221209-FL20S-SCF-TBA-Stock

DWG No. SCF-Q200221209-01

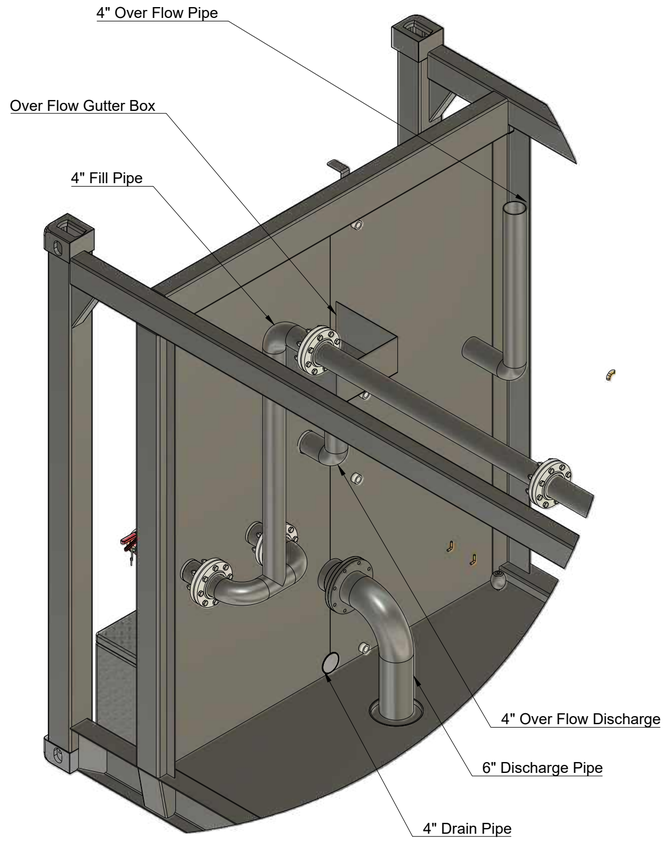
Rev. A

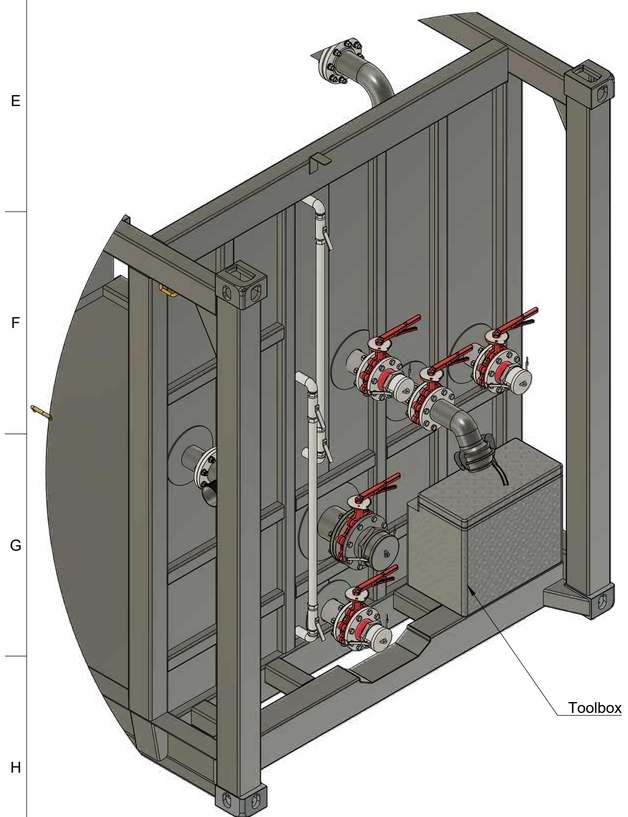


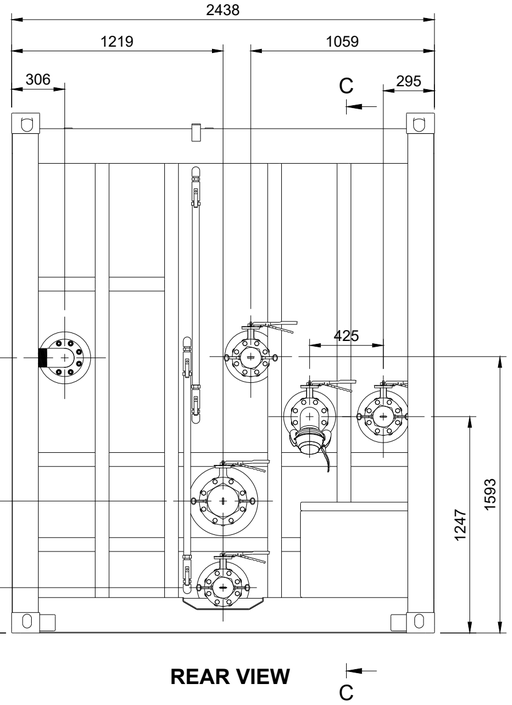
SIDE VIEW



A-A

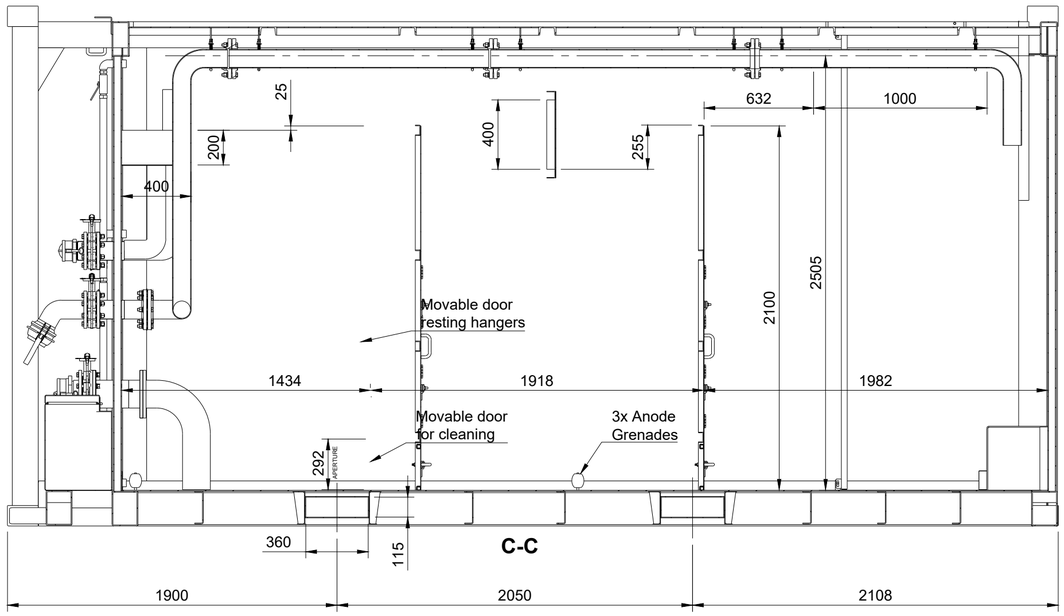






REAR VIEW

C



C-C

DIMENSION TOLERANCES U.N.O		
0 ~ 5mm	±	0.5
5 ~ 50mm	±	1.0
50 ~ 150mm	±	1.5
150 ~ 500mm	±	2.0
500 ~ 1000mm	±	2.5
1000 ~ 2000mm	±	3.0
2001 ~ 5000mm	±	5.0
>5000mm	±	10.0
ANGULAR	±	0.25°

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SCALE

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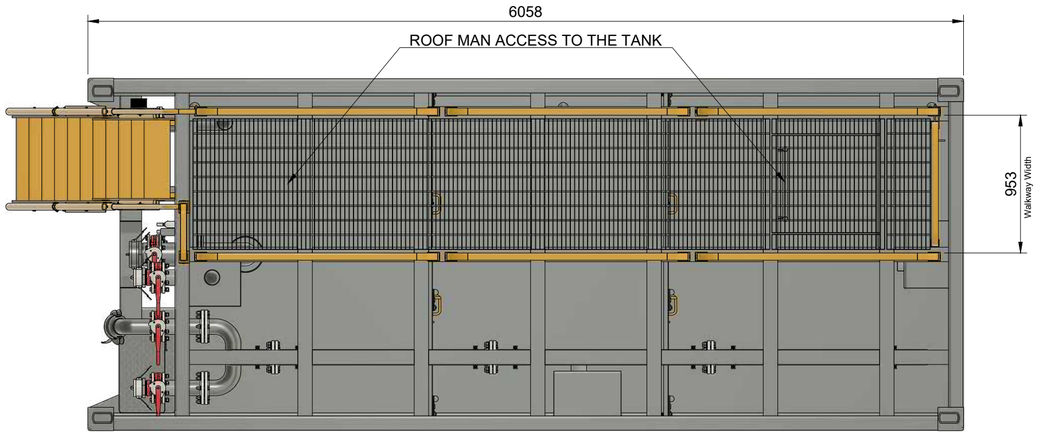
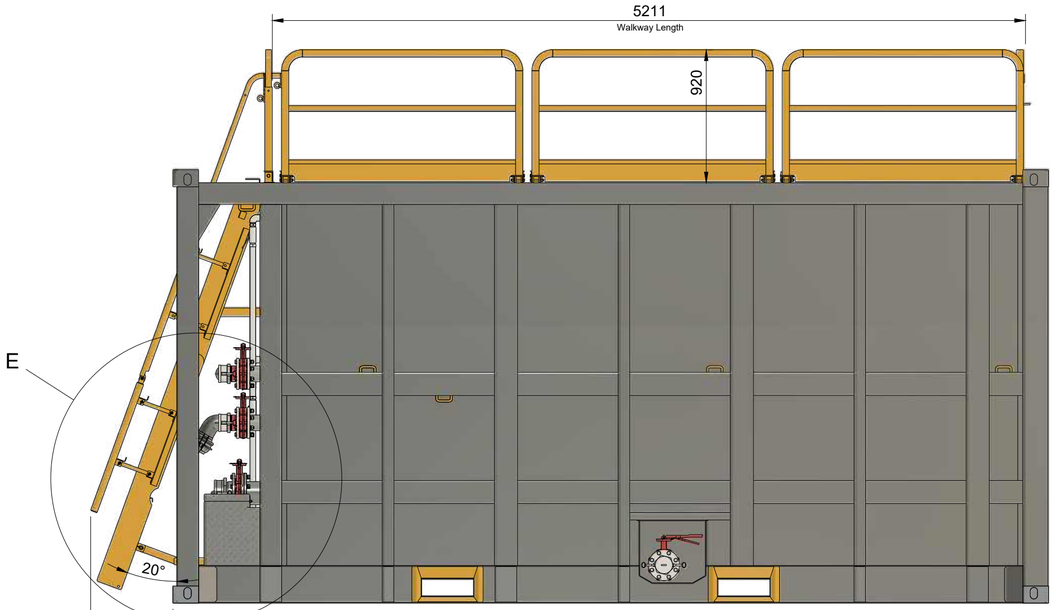
Title: Q200221209-FL20S-SCF-TBA-Stock

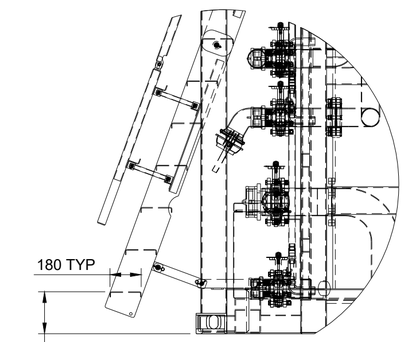
DWG No. SCF-Q200221209-01

Rev. A

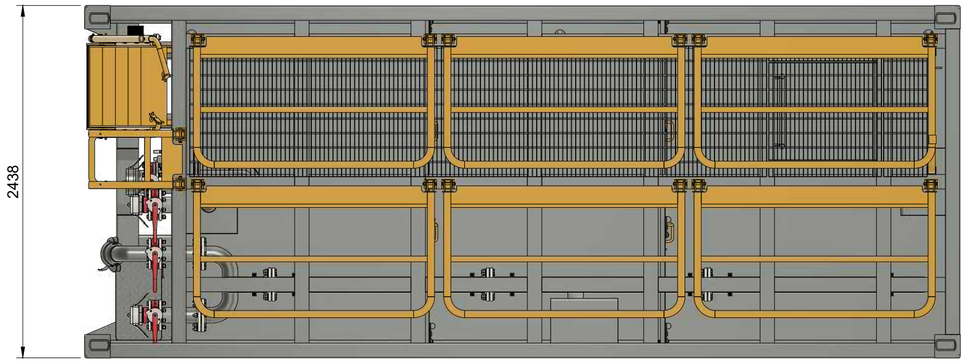
OPEN HANDRAILS AND LADDER

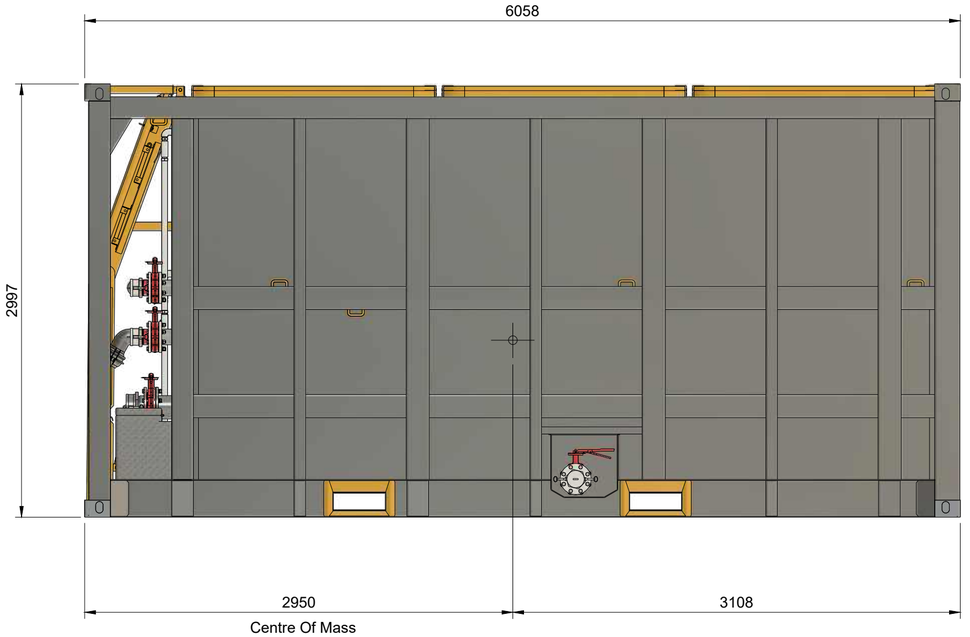






PACKED HANDRAILS AND LADDER





DIMENSION TOLERANCES U.N.O		
0 ~ 5mm	±	0.5
5 ~ 50mm	±	1.0
50 ~ 150mm	±	1.5
150 ~ 500mm	±	2.0
500 ~ 1000mm	±	2.5
1000 ~ 2000mm	±	3.0
2001 ~ 5000mm	±	5.0
>5000mm	±	10.0
ANGULAR	±	0.25°

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Title: Q200221209-FL20S-SCF-TBA-Stock

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Attachment 8F: Bund capacity assessment (centrifuge)

Description	Volume	110% Volume	Comments
Mix Tank	30 kL	33 kL	provided by ExEE
Frac Tank	32 kL	35.2 kL	32kl for 20ft or 70kL for 40ft
Basket Strainer 1	50 L	54.8 L	provided by ExEE
Basket Strainer 2	50 L	54.8 L	provided by ExEE
Decanter	123.6 L	136.0 L	ø14" x 49"
Pipework	100 L	110.0 L	estimate
Total Volume	62.32 kL		
25% Total	16 kL		

		Bund Dimensions	
Required Bund	35.2 kL	Length	18.00 m
Height Needed	415.6 mm	Width	6.40 m
with FoS (15%)	477.92 mm	Lost area (L)	12.20 m
		Lost area (W)	2.50 m

Attachment 10: Proposed fee

Works approval fee components: premises component

Category	Description	Capacity	Capacity Range
61	Liquid waste facility	40,000 tonnes per annual period	More than 10,000 tonnes per year
61A	Solid waste premises	80,000 tonnes per annual period	More than 10,000 but not more than 100,000 tonnes per year
47	Scrap metal recovery	40,000 tonnes per annual period	More than 10,000 but not more than 100,000 tonnes per year

Works approval fee components: premises construction cost

Activity	Total [$ AUD]
Decontamination Tanks	[redacted]
Wash Tanks	
Pumps	
Containers	
Water Treatment Equipment	
Gantry Cranes	
Engineering Design	
Owners Costs	
Total (incl. GST)	

Works approval fee

Component	Unit [$AUD]
Total cost	[redacted]
Fee units (Schedule 3)	
Cost per unit (Regulation 4(5))	
Total works approval fee	

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