

EA ATTACHMENTS



Benbow
ENVIRONMENTAL

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RTB/md

Ref: 148168_Let1

01 October 2014

Chris Ritchie,
Mr Chris Ritchie
Manager Major Projects Assessment
Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Email: chris.ritchie@planning.nsw.gov.au

Dear Sir,

Re: S96 Application for Change of Existing Approved Use
Redox Pty Limited, 2 Swettenham Road, Minto 2566

Directors of Redox Pty limited request a meeting to discuss an aspect of their operations at the Minto site.

The Minto site was approved as a Major Project back in 2003: Development Application 367-11-2002-i, lodged with the Department of Planning on 1 November 2002.

As part of the development, a roofed decanting area/tank farm was part of the proposal. The development permitted the following Classes of dangerous goods to be allowed on site:

- Class 3 PG II and PG III.
The only sub-risk Class not permitted was Class 3 (6.1) Packing Group I (Packaging Group is now referred to as Packing Group and is an indication of the level of danger).
- Class 5.1, solids, Packing Group III.
- Class 8 all Packing Groups and sub-risks.
- Class 9 all Packing Groups and sub-risks (although these are rarely encountered).
- Non-dangerous goods.

The roofed decanting area/tank farm has not been developed. It is now proposed to construct and operate this facility but with changes requested to the types of chemicals that would be stored and decanted as a result of business needs.

Clauses 4.36 and 4.37 required specific action to undertake prior to the commencement of decanting acetic acid. The acetic acid to be decanted belongs to dangerous goods Class 8.

The Directors have identified the following dangerous goods are desired to be stored and decanted:

- Class 8 with sub-risk Class 3 and sub-risk 6.1.
- Alkali.
- Acids.
- Food grade products.

The following is the full list of chemicals:

• Phosphoric acid	Class 8
• Formic acid	Class 8(3)
• Acetic acid	Class 8(3)
• Ferric chloride	Class 8
• Sulphuric acid 98%	Class 8
• Fluoro silicic acid	Class 8(6.1)
• Citric acid	Food grade
• "Adblue" Diesel additive	
• Urea ammonium nitrate solution	
• Sodium hypochlorite	Class 8
• Sodium hydroxide	Class 8
• Potassium hydroxide	Class 8

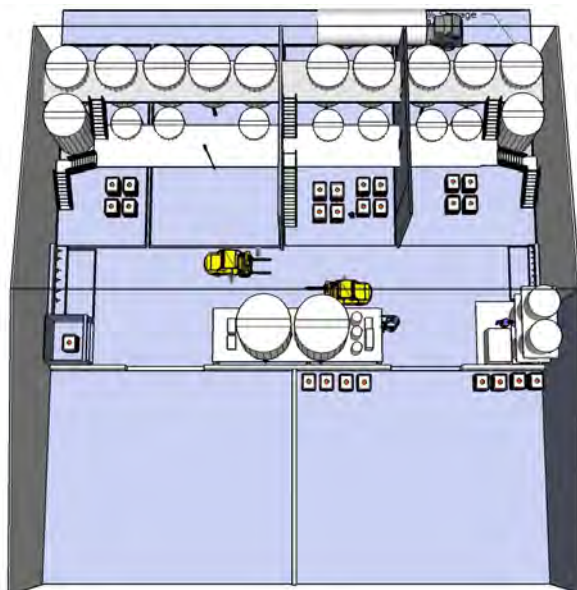
The decanting operations would consist of the following:

- IBC filling stations
- Drum filling
- Potentially smaller packages

The ambitions of the facility are the following:

- 12 storage tanks
- 7 to 8 mixing tanks

The diagram below shows a schematic view.



Chemicals stored in the proposed 12 bunded and roofed tanks would be filled by road tankers.

The chemicals would be metered into the mixing tanks. From these tanks once the chemicals had been diluted using demineralised water, the decanting into IBCs, 205L drums and 15L–25L containers would occur.

The proposed operations are not significantly different to the original proposal but would be more extensive than originally envisaged. Annual through-put would be greater than envisaged and the number of storage tanks greater in number.

In submitting a S96 Application (or the particular approach you will advise) the following studies would be submitted:

- A preliminary hazard analysis to SEPP33.
- A Fire Safety Study to HIPAP No. 2.
- A statement of the proposal providing an explanation of the proposed operations.
- A noise impact assessment.
- An air quality assessment satisfying Clauses 4.36 and 4.37.
- Details of the scrubbers as different scrubbers will be needed for the acids and alkalies.
- Environmental risk assessment.
- Discussion of safeguards.
- Other matters raised during our discussions.

Yours faithfully,
for Benbow Environmental


R T Benbow
Principal Consultant



Acknowledgement Number: NDG037356

13 February 2015



014 001033
REDOX PTY LTD
2 Swettenham Rd
MINTO NSW 2566

Dear Sir/Madam

RE: Notification of Hazardous Chemicals on Premises: 2 Swettenham Rd, MINTO NSW 2566, AUSTRALIA

We recently wrote to you to let you know about the new hazardous chemical notification requirements under the *Work Health and Safety Regulation 2011 (The Regulation)*.

The new requirements commenced on 1 January 2015. Enclosed is a copy of your new Acknowledgement of Notification for the storage and handling of hazardous chemicals at the above premises.

Your new Acknowledgment of Notification has no expiry date and no further notification will be required unless there are changes to the notified details.

If there are changes to the notified details you will need to complete a form and request the amendment to your notification record, at least 14 days prior to any changes occurring. Significant changes that must be notified include changes to:

- The type
- The quantity
- The location of hazardous chemicals within your premises and/or
- Any change of contact details (including emergency contacts)
- If you no longer occupy the site.

To notify WorkCover NSW of any changes, you need to complete *The Notification of Schedule 11 hazardous chemicals* form. The form and supporting guidelines can be found on the WorkCover NSW website: www.workcover.nsw.gov.au.

We also recently requested that you provide your site plan/s and updated contact details of two emergency contact people by 31 March 2015. This information will help ensure the requirements of the Regulation are met. If you have already provided us with this information, no further action is required and we thank you for responding.

If you have any further enquiries, please refer to the guidelines or phone our Customer Service Centre on 13 10 50.

Yours sincerely,



Fiona Hayman
Operations Manager, Customer Service Centre
WorkCover Authority of NSW



WorkCover NSW
92-100 Dorrimon Street, Gosford, NSW 2250
Locked Bag 2906, Lisarow, NSW 2252
T 02 4321 5000 F 02 4325 4145
WorkCover Assistance Service 13 10 50
DX 731 Sydney workcover.nsw.gov.au

Customer Service Centre – Operations
Ph: 13 10 50 Fax: 02 9287 5500

13 February 2015

REDOX PTY LTD
2 Swettenham Rd
MINTO NSW 2566

ACKNOWLEDGEMENT OF NOTIFICATION OF HAZARDOUS CHEMICALS ON PREMISES

ISSUED UNDER AND SUBJECT TO THE PROVISIONS OF THE WORK HEALTH AND SAFETY
ACT 2011 AND REGULATION THEREUNDER

Acknowledgement Number NDG037356

Issued To REDOX PTY LTD

Trading as

Premises where notified hazardous chemicals are stored/handled

2 Swettenham Rd, MINTO NSW 2566, AUSTRALIA

Emergency Contacts for this site:

1. Malcolm Perrins

Ph. 02 9733 3000

Site Staffing Site Hours: Site Hours: 16 HRS 5 DAYS 120 STAFF

This acknowledgement must be retained as PROOF OF NOTIFICATION
You must notify WorkCover of applicable changes, specified in the Work Health and Safety
Regulation 2011, to the Hazardous Chemicals used, handled or stored on these premises.

Issued To REDOX PTY LTD
Acknowledgement Number NDG037356

13 February 2015

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
B1	Roofed Store	450000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1123	BUTYL ACETATES	3	5000Kg	II
2319	TERPENE HYDROCARBONS, N.O.S.	3	5000Kg	III
1148	DIACETONE ALCOHOL	3	5000Kg	III

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
B2	Roofed Store	450000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1779	FORMIC ACID with more than 85% acid by mass	8	30000Kg	II
3272	ESTERS, N.O.S.	3	5000Kg	III
1779	FORMIC ACID	8	10000Kg	II
2789	ACETIC ACID SOLUTION	8	15000Kg	II

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
C3	Roofed Store	1000000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
2922	CORROSIVE LIQUID, TOXIC, N.O.S.	8	30000Kg	II
1814	POTASSIUM HYDROXIDE SOLUTION	8	2000Kg	II
2922	CORROSIVE LIQUID, TOXIC, N.O.S.	8	20000Kg	II
2672	AMMONIA SOLUTION	8	30000Kg	III
2491	ETHANOLAMINE	8	15000Kg	III
1823	SODIUM HYDROXIDE, SOLID	8	100000Kg	II
1824	SODIUM HYDROXIDE SOLUTION	8	250000Kg	II

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
D1	Roofed Store	1000000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
2586	ALKYLSULPHONIC ACIDS, LIQUID with not more than 5% free sulphuric acid	8	10000Kg	III

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Regulation 2011, to the Hazardous Chemicals used, handled or stored on these premises.

Issued To REDOX PTY LTD
Acknowledgement Number NDG037356

13 February 2015

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
D1	Roofed Store	1000000		
1805	PHOSPHORIC ACID, SOLUTION	8	10000Kg	III
2967	SULPHAMIC ACID	8	10000Kg	III
3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.	8	100000Kg	III
2796	SULFURIC ACID	8	85000Kg	II
1805	PHOSPHORIC ACID	8	100000Kg	III
1789	HYDROCHLORIC ACID	8	149000Kg	II

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
D2	Roofed Store	1000000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1710	TRICHLOROETHYLENE	6.1	10000Kg	III
2659	SODIUM CHLOROACETATE	6.1	20000Kg	III
1593	DICHLOROMETHANE	6.1	70000Kg	III
2674	SODIUM FLUOROSILICATE	6.1	50000Kg	III

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
E2	Roofed Store	1000000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1813	POTASSIUM HYDROXIDE, SOLID	8	30000Kg	II

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
E2	Roofed Store	400000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1849	SODIUM SULFIDE, HYDRATED	8	70000Kg	II
3253	DISODIUM TRIOXOSILICATE	8	70000Kg	III
2949	SODIUM HYDROSULFIDE	8	130000Kg	II
1823	SODIUM HYDROXIDE, SOLID	8	10000Kg	II

This acknowledgement must be retained as PROOF OF NOTIFICATION
You must notify WorkCover of applicable changes, specified in the Work Health and Safety Regulation 2011, to the Hazardous Chemicals used, handled or stored on these premises.



WorkCover NSW
92-100 Donnison Street, Gosford, NSW 2250
Locked Bag 2906, Lisarow, NSW 2252
T 02 4321 5000 F 02 4325 4145
WorkCover Assistance Service 13 10 50
DX 731 Sydney workcover.nsw.gov.au

Issued To REDOX PTY LTD
Acknowledgement Number NDG037356

13 February 2015

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
J1	Roofed Store	250000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1498	SODIUM NITRATE	5.1	2000Kg	III
1486	POTASSIUM NITRATE	5.1	2000Kg	III
1498	SODIUM NITRATE	5.1	1000Kg	III

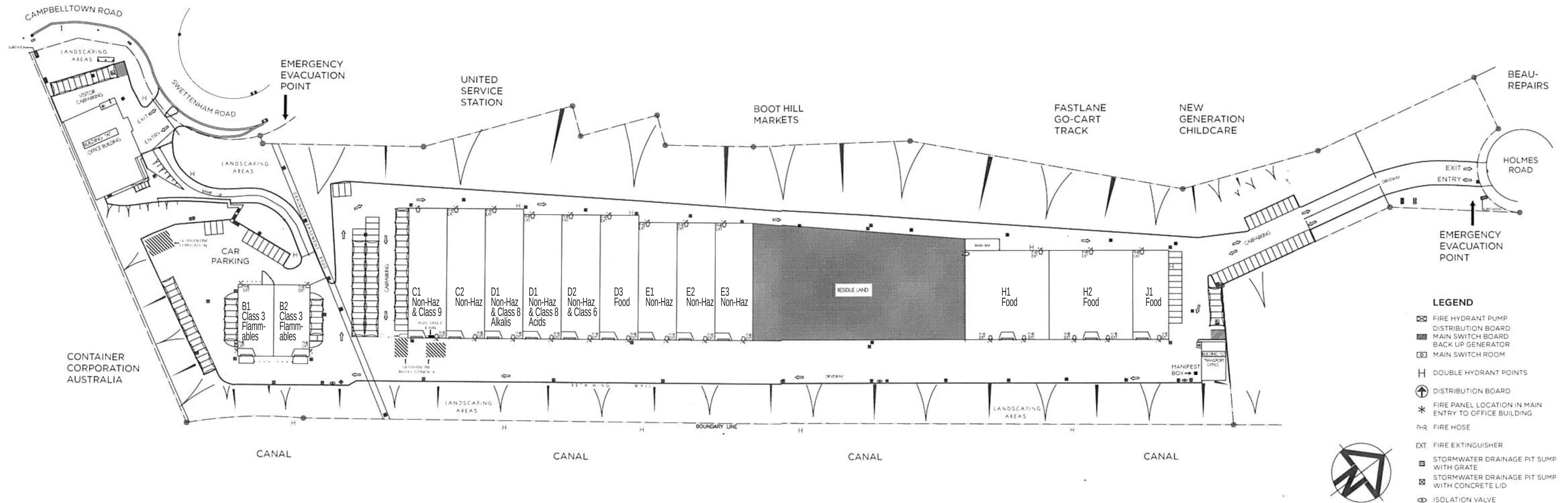
This acknowledgement must be retained as PROOF OF NOTIFICATION
You must notify WorkCover of applicable changes, specified in the Work Health and Safety
Regulation 2011, to the Hazardous Chemicals used, handled or stored on these premises.

EA Attachment 3: A1 copy of the plan

Minto Site Plan

2 Swettenham Road
Minto NSW 2566
Lot 171 DP 878463

APPROVED: 11th August 2015
SCALE: 1:700



BUNDING:
All warehouses have bunding.
Warehouse floors are 100mm
below the level of the outside
pavement.

EA Attachment 4: List of Dangerous Goods Classes

Class 1



Explosive. Not encountered on majority of sites, so no further discussion is provided.

Class 2

Division 2.1



These are gases and there are several classes usually encountered. These are discussed further.

Flammable gases. Common examples are hydrogen, acetylene, LPG and natural gas.

With these gases, there is high risk of fire and a possibility of explosion resulting from a fire.

A number of safeguards are required, with principal ones being:

- Separation from ignition sources;
- Secure chaining;
- Signage; and
- Security.

Division 2.2



Compressed inert gases. Common examples are argon, nitrogen, carbon dioxide, and air.

Oxygen has a subsidiary risk as it supports combustion and is therefore a Class 2.2 (5.1) dangerous goods. It is stored against its primary class and not as subsidiary risk class (i.e. Division 5.1).

Principle safeguards are:

- Separation from other classes with special emphasis for oxygen to be separated from flammable gases using distance (3m) or a vapour barrier usually constructed of metal;
- Chaining;
- Security; and
- Signage.

Division 2.3



Toxic gases.

Common examples are sulphur dioxide, ammonia and chlorine.

Ammonia may have a subsidiary risk of being corrosive.

Principle safeguards are segregation, detailed risk assessment of location.

Class 3



Flammable liquids.

Flammable liquids and the other remaining classes are divided into three further descriptions depending on the characteristics of the dangerous goods – PGI, PGII or PGIII. PG stands for packing group.

The level of danger diminishes from PGI to PGIII.

PGI represents great danger – e.g.: ether.

PGII represents medium danger e.g.: acetone, petrol.

PGIII represents minor damage e.g.: kerosene, turpentine.

The storage of Class 3 flammable liquids requires a detailed assessment and safeguards are numerous. Reference to AS 1940—2017 provides detailed guidance on storage and use and handling of flammable and combustible liquids. Combustible liquids are placed into either of two Classes; Class C1 or C2. An example of C1 is diesel; C2 examples are cooking oil and lubricating oil.

Class 4 Division 4.1



Flammable solids, react with air and flammable when wet.

Flammable solids.

Common examples are bulk storage of matches, sulphur.

Division 4.2



Reacts with air and spontaneously combusts.

Common examples are infrequently encountered.

Division 4.3



Flammable when wet.

Similarly these are not common, with dross and aluminium powder as examples. When wet, a flammable gas is emitted. Aluminium dross also emits ammonia, which is a toxic gas.

Class 5
Division 5.1



Oxidising substances and organic peroxides.

Oxidising substances.

These provide a source of oxygen. Examples are perchloric acid, ammonium nitrates.

These substances are also highly reactive with other classes of dangerous goods such as acids, alkali. Main safeguard is to provide segregation.

Division 5.2



Organic Peroxides.

These also provide a strong source of oxygen and are reactive with many other chemicals.

A common example is hydrogen peroxide. Main safeguard is to provide segregation. The organic peroxides are classified into five categories – A, B, C, D, E and F – with A and B being highly unstable. Refrigeration is frequently used for the storage of Division 5.2 substances.

Class 6
Division 6.1



Toxic and infectious substances.

Toxic substances.

These are poisonous substances and a number of safeguards are required for their storage, use and handling. Disposal of empty containers is also a critical issue. Preventing contamination of work surfaces and long-term soil or groundwater contamination are important issues. Environmental damage from spillage is a key issue requiring safeguards and training.

Division 6.2



Infectious substances. These are frequently encountered on industrial sites.

Class 7



Nuclear (radioactive) substances.

Class 8



Corrosive substances.

There are large families of these that are commonly encountered. Acids and alkali both being reactive belong to Class 8 and need special care.

Class 8 substances can be reactive with other Classes such as Divisions 5.1, 5.2 and 6.1. Safeguards are detailed. AS 3780—2008 provides a comprehensive set of guides.

Class 9



Miscellaneous substances.

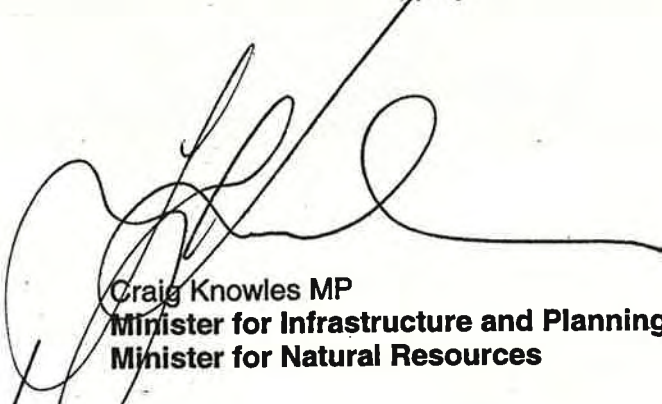
This Class is becoming more frequently encountered and an Australian Standard provides guidance on storage use and handling.

**DETERMINATION OF A DEVELOPMENT APPLICATION
FOR STATE SIGNIFICANT, DESIGNATED AND INTEGRATED DEVELOPMENT
PURSUANT TO SECTION 80 OF THE
ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979**

I, the Minister for Infrastructure and Planning, pursuant to section 80 of the *Environmental Planning and Assessment Act 1979* ("the Act") determine the development application ("the Application") referred to in Schedule 1 by granting consent subject to the conditions set out in Schedule 2.

The reason for the imposition of conditions is to:

- a) minimise any adverse environmental impacts associated with the development;
- b) ensure effective on-going environmental and safety management and monitoring;
- c) minimise potential safety impacts associated with the development; and
- d) implement the recommendations of the Commission of Inquiry into all environmental aspects of the development.


Craig Knowles MP
Minister for Infrastructure and Planning
Minister for Natural Resources

Sydney,

16/9

2003

File No. S01/01687

SCHEDULE 1

Application made by: Redox Chemicals Pty Ltd ("the Applicant");

To: The Minister administering the *Environmental Planning and Assessment Act 1979* (at the time of lodgement, the Minister for Planning);

In respect of: Land described as Lot 171 DP 878463, Swettenham Road, Minto, Campbelltown local government area.

For the following: Construction and operation of a chemical storage and distribution centre and associated infrastructure ("the development"), as described in *Environmental Impact Statement: Greenfield Development for Major Storage and Distribution Centre, Redox Chemicals Pty Limited* (two volumes) prepared by Dick Benbow & Associates Pty Limited and dated October 2002;

Development Application: Integrated DA No. 367-11-2002-i, lodged with the Department of Planning on 1 November 2002, accompanied by *Environmental Impact Statement: Greenfield Development for Major Storage and Distribution Centre*,

Redox Chemicals Pty Limited (two volumes) prepared by Dick Benbow & Associates Pty Limited and dated October 2002;

State Significant Development

Under Section 76A(7) of the Act, the development is classified as State Significant development by virtue of it being a development to which *State Environmental Planning Policy No. 34 – Major-Employment Generating Industrial Development* applies.

Commission of Inquiry

The development was subject to a Commission of Inquiry under section 119 of the *Environmental Planning and Assessment Act 1979*. The primary session of the Inquiry was held on Wednesday 12 March 2003. The reply session of the Inquiry was held on Thursday 8 May 2003. The Commissioner's recommendations following the Inquiry are detailed in *Report to the Honourable Craig Knowles MP, Minister for Infrastructure and Planning, Minister for Natural Resources – Proposed Chemical Storage and Distribution Facility, Campbelltown City*, dated June 2003.

Operation of Consent

Pursuant to section 83(1)(b)(i) of the *Environmental Planning and Assessment Act 1979*, this consent operates from the date endorsed on the consent because the development is a "designated development" for which a Commission of Inquiry has been held.

Lapse of Consent

Pursuant to section 95(1) of the *Environmental Planning and Assessment Act 1979*, this development consent is liable to lapse five years from the date from which it operates, unless the use of any land, building or work the subject of the consent is physically commenced before the date on which the consent would otherwise lapse.

Appeal Rights

Because a Commission of Inquiry was held for the proposed development there are no appeal rights to the Land and Environment Court for the Applicant under section 97 of the *Environmental Planning and Assessment Act 1979* or for third-party objectors under section 98 of that Act.

BCA Classification:

Office Buildings, Warehouse Office – Class 5
Warehouse – Class 7b
Roofed decanting area/tank farm – Class 10a

KEY TO CONDITIONS

1. GENERAL	5
Obligation to Minimise Harm to the Environment	5
Scope of Development	5
Provision of Documents	6
Statutory Requirements	6
Dispute Resolution	6
2. COMPLIANCE	7
3. CONSTRUCTION AND PART 4A CERTIFICATION	7
4. ENVIRONMENTAL PERFORMANCE	8
Hazards and Risk Impacts	8
Traffic and Transport	10
Noise Impacts	11
Soil and Water Impacts	13
Waste Generation and Management	14
Air Quality Impacts	15
Visual Amenity Impacts	16
5. ENVIRONMENTAL MONITORING AND AUDITING	16
Transport Auditing	16
Noise Monitoring and Auditing	17
Stormwater Quality Monitoring	18
Air Quality Monitoring and Auditing	18
Independent Hazard Auditing	19
Independent Environmental Auditing	19
6. COMMUNITY INFORMATION, CONSULTATION AND INVOLVEMENT	20
Complaints Procedure	20
Community Communication Strategy	20
7. ENVIRONMENTAL MANAGEMENT	21
Environmental Representative	21
Construction Environmental Management Plan	21
Operation Environmental Management Plan	24
8. ENVIRONMENTAL REPORTING	26
Incident Reporting	26
Annual Performance Reporting	26

SCHEDULE 2

In this consent, except in so far as the context or subject-matter otherwise indicates or requires, the following terms have the meanings indicated:

Act	<i>Environmental Planning and Assessment Act, 1979</i>
AEMR	Annual Environmental Management Report
Applicant	Redox Chemicals Pty Ltd
BCA	Building Code of Australia
construction	any activity requiring a Construction Certificate under Part 4A of the <i>Environmental Planning and Assessment Act 1979</i>
Council	Campbelltown City Council
Department	NSW Department of Infrastructure, Planning and Natural Resources
development	the development to which this consent applies, the scope of which is described in the documents listed under condition 1.2 of this consent
Director-General	Director-General of the NSW Department of Infrastructure, Planning and Natural Resources, or delegate
DSNR	former NSW Department of Sustainable Natural Resources (part of the Department of Infrastructure, Planning and Natural Resources at the time of determination of this consent)
dust	any solid material that may become suspended in air
EIS	<i>Environmental Impact Statement: Greenfield Development for Major Storage and Distribution Centre, Redox Chemicals Pty Limited</i> (two volumes) prepared by Dick Benbow & Associates Pty Limited and dated October 2002
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence issued under the <i>Protection of the Environment Operations Act, 1997</i>
Minister	the Minister administering the <i>Environmental Planning and Assessment Act 1979</i> , or delegate
operation	any activity required for, or associated with, the receipt, warehousing, handling, decanting, packaging or redistribution of dangerous and non-dangerous goods at, on or from the site
Principal Certifying Authority	the Minister or an accredited certifier, appointed under section 109E of the Act, to issue a Part 4A Certificate as provided under section 109C of the Act
Regulation	<i>Environmental Planning and Assessment Regulation, 2000</i>
POEO Act	<i>Protection of the Environment Operations Act, 1997</i>
site	the land to which this consent applies
site preparation	those works required to be undertaken on the site prior to the commencement of construction, and not including construction or operation
Stage 1	Construction and use of the Administration Building (Building A), Transport Office (Building G), Building B, Building C, Building D, Building J, Decanting Area (Area "K"), and associated infrastructure
Stage 2	Construction and use of Building E
Stage 3	Construction and use of Building I
Stage 4	Construction and use of Building H and Tank Farm and Drumming Facility (Building "F").

1. GENERAL

Obligation to Minimise Harm to the Environment

- 1.1 The Applicant shall implement all practicable measures to prevent or minimise any harm to the environment that may result from the construction, commissioning, operation and where relevant, the decommissioning of the development.

Scope of Development

- 1.2 ¹The Applicant shall carry out the development generally in accordance with:
- a) Development Application No. 367-11-2002-i, lodged with the Department of Planning on 1 November 2002;
 - b) *Environmental Impact Statement: Greenfield Development for Major Storage and Distribution Centre, Redox Chemicals Pty Limited* (two volumes) prepared by Dick Benbow & Associates Pty Limited and dated October 2002;
 - c) additional information in relation to the location of boom gates, with attached drawing (project no. P1045, job no. 1169-02, sheet no. A01, issue A), supplied by letter from Dick Benbow & Associates Pty Limited to the Department, dated 17 December 2002 (ref: 11106let21);
 - d) additional information, titled *Request for Information Response for Redox Chemicals Pty Ltd Proposed Chemical Storage and Distribution Facility, Minto DA No.367-11-2002-i*, in relation to noise, traffic and hazards, supplied by letter from Dick Benbow & Associates Pty Limited to the Department and EPA, and dated February 2003;
 - e) additional information, titled *Request for Information Response for Redox Chemicals Pty Ltd DA No. 367-11-2002-i – Submission B*, in relation to air quality, supplied by letter from Dick Benbow & Associates Pty Limited to the Department and EPA, and dated February 2003;
 - f) additional information, titled *Request for Information Response for Redox Chemicals Pty Ltd DA No. 367-11-2002-i – Submission C*, in relation to transport and drainage, supplied by letter from Dick Benbow & Associates Pty Limited to the Department and DSNR, dated February 2003;
 - g) *Outline Submission to Commission of Inquiry – Redox Chemicals Pty Ltd – Proposed Chemical Storage and Distribution Facility, Minto DA 367-11-2002-i*, prepared by Dick Benbow & Associates Pty Limited, and dated February 2003;
 - h) additional information, titled *Questions from PlanningNSW – Outstanding Issues*, supplied by Dick Benbow & Associates Pty Limited to the Department (not dated), in relation to erosion control, accompanied by Plan 57206EC (plan dated March 2003);
 - i) additional information supplied by letter from Dick Benbow & Associates Pty Limited to the Department, in relation to questions arising from the primary session of the Commission of Inquiry, and dated 10 April 2003 (ref: 12175let21);
 - j) additional information supplied by facsimile from Dick Benbow & Associates Pty Limited to the EPA., providing responses to questions raised by the EPA during the Commission of Inquiry, and dated 17 April 2003 (ref: RB/12175fax45);
 - k) additional information supplied by facsimile from Dick Benbow & Associates Pty Limited to the EPA, providing attachments to responses to questions raised by the EPA during the Commission of Inquiry, and dated 17 April 2003 (ref: RB/12175fax44);
 - l) additional information supplied by facsimile from Dick Benbow & Associates Pty Limited to the EPA, providing information omitted in responses to questions raised by the EPA during the Commission of Inquiry, and dated 29 April 2003 (ref: RB/12175fax48);
 - m) *Commission of Inquiry – Session in Reply – Redox Chemicals Pty Ltd – Proposed Chemical Storage and Distribution Facility DA 367-11-2002-i*, prepared by Dick Benbow & Associates Pty Limited and dated May 2003;

¹ Incorporates an EPA General Term of Approval (A1.1)
NSW Government
Department of Infrastructure, Planning and Natural Resources

- n) plans accompanying the development application, with drawing numbers: A01-Issue C, A02-Issue B, A03-Issue C, A02-Issue C, A05-Issue C, A06-Issue C, A07-Issue C, A08-Issue C and A09-Issue B;
- o) drawings provided to the EPA in relation to stormwater concept plan for the operational site, with reference numbers 1169-02 Sheet 1 (Revision C) and 1169-02 Sheet 2 (Revision C); and
- p) the conditions of this consent.

1.3 In the event of an inconsistency between:

- a) the conditions of this consent and any document listed from condition 1.2a) to 1.2o) inclusive, the conditions of this consent shall prevail to the extent of the inconsistency; and
- b) any document listed from condition 1.2a) to 1.2o) inclusive, and any other document listed from condition 1.2a) to 1.2o) inclusive, the most recent document shall prevail to the extent of the inconsistency.

Provision of Documents

- 1.4 Where practicable, the Applicant shall provide all documents and reports required to be submitted to the Director-General under this consent in an appropriate electronic format. Provision of documents and reports to other parties, as required under this consent, shall be in a format acceptable to those parties and shall aim to minimise resource consumption.
- 1.5 Nothing in this consent prevents the Applicant from combining reporting requirements under this consent with identical or similar reporting requirements for submission to another relevant party. Reporting requirements shall only be combined with the prior agreement of the Director-General of Infrastructure, Planning and Natural Resources and the Director-General (or equivalent) of the other relevant party.

Note: the purpose of conditions 1.4 and 1.5 is to provide for minimisation of resource utilisation (particularly paper) associated with administration of this consent. At the time of granting this consent, an "appropriate electronic format" for submission to the Director-General and the Department is portable document format (pdf).

Statutory Requirements

- 1.6 ²The Applicant shall ensure that all licences, permits and approvals are obtained and kept up-to-date as required throughout the life of the development. No condition of this consent removes the obligation for the Applicant to obtain, renew or comply with such licences, permits or approvals.

Dispute Resolution

- 1.7 In the event that a dispute arises between the Applicant and Council or the Applicant and a public authority other than the Department, in relation to a specification or requirement applicable under this consent, the matter shall be referred by either party to the Director-General, or if not resolved, to the Minister, whose determination of the dispute shall be final and binding on all parties. For the purpose of this condition, "public authority" has the same meaning as provided under section 4 of the Act.

Note: Section 121 of the *Environmental Planning and Assessment Act 1979* provides mechanisms for resolution of disputes between the Department, the Director-General, councils and public authorities.

² Incorporates a DSNR General Term of Approval (1)
 NSW Government
 Department of Infrastructure, Planning and Natural Resources

2. COMPLIANCE

- 2.1 The Applicant shall ensure that employees, contractors and sub-contractors are aware of, and comply with, the conditions of this consent relevant to their respective activities.
- 2.2 The Applicant shall be responsible for environmental impacts resulting from the actions of all persons on the site, including contractors, subcontractors and visitors.
- 2.3 Prior to each of the events listed from a) to c) below, or within such period otherwise agreed by the Director-General, the Applicant shall certify in writing to the satisfaction of the Director-General, that it has complied with all conditions of this consent applicable prior to that event.
- a) commencement of any physical works on the land the subject of this consent;
 - b) commencement of construction of stages 1, 2, 3 and 4 of the development respectively; and
 - c) commencement of operation of stages 1, 2, 3 and 4 of the development, respectively.
- 2.4 Notwithstanding condition 2.3 of this consent, the Director-General may require an update report on compliance with all, or any part, of the conditions of this consent. Any such update shall meet the requirements of the Director-General and be submitted within such period as the Director-General may require.
- 2.5 The Applicant shall meet the requirements of the Director-General in respect of the implementation of any measure necessary to ensure compliance with the conditions of this consent, and general consistency with the documents listed under condition 1.2 of this consent. The Director-General may direct that such a measure be implemented in response to the information contained within any report, plan, correspondence or other document submitted in accordance with the conditions of this consent, within such time as the Director-General may require.

3. CONSTRUCTION AND PART 4A CERTIFICATION

- 3.1 In relation to the construction and occupation of the development, the Applicant shall provide the Director-General and Council with the following:
- a) written notification of the appointment of a Principal Certifying Authority to be received at least two working days prior to the commencement of construction;
 - b) copies of all Construction Certificates issued for the development;
 - c) written notification of the intention to commence construction work, to be received at least two working days prior to the commencement of construction. In the event that more than one Construction Certificate is issued, notification shall be provided prior to the commencement of construction the subject of each Certificate;
 - d) copies of all Occupation Certificates issued for the development; and
 - e) written notification of the intention to occupy the development, to be received at least two working days prior to occupation. In the event that more than one Occupation Certificate is issued, notification shall be provided prior to the occupation the subject of each Certificate.
- 3.2 Prior to the commencement of any construction associated with the development, the Applicant shall erect at least one sign at the construction site and in a prominent position at the site boundary where the sign can be viewed from the nearest public place. The sign(s) shall indicate:
- a) the name, address and telephone number of the Principal Certifying Authority;
 - b) the name of the person in charge of the construction site and telephone number at which that person may be contacted outside working hours; and
 - c) a statement that unauthorised entry to the construction site is prohibited.

The sign(s) shall be maintained for the duration of construction works, and shall be removed as soon as practicable after the conclusion of the construction works.

4. ENVIRONMENTAL PERFORMANCE

Hazards and Risk Impacts

- 4.1 For each of the dangerous goods classes (as defined by the Australian Dangerous Goods Code) and materials listed in the table below, the Applicant shall not permit the materials listed as “prohibited” to be received, stored or handled on the site. To avoid any doubt, the Applicant shall only permit the materials listed as “permitted” to be received, stored or handled on the site. This condition does not apply to those materials that may be associated with office, laboratory, construction, maintenance or vehicular/ equipment components (including forklifts) of the development, and are not purchased and sold as part of the principal commercial operations of the development.

Dangerous Goods Class	Prohibited	Permitted
Class 1	All	None
Class 2	All	None
Class 3	Packaging group I Subclass 6.1	Packaging groups II and III (unless otherwise prohibited)
Class 4	All	None
Class 5	All except those listed as permitted	Solids of class 5.1, packaging group III
Class 6	Subclass 3 All Class 6.2	All Class 6.1 (unless other, but not class 6.1 with subclass 3)
Class 7	All	None
Class 8	None	All
Class 9	None	All
Non-dangerous goods	None	All

- 4.2 The Applicant shall only permit non-dangerous goods, and dangerous goods of class 8 to be stored or handled in bulk on the site.
- 4.3 Prior to any dangerous goods being brought to the site, the Applicant shall demonstrate to the satisfaction of the Director-General that it has a system in place to track the quantities and locations of dangerous goods on the site at all times.

Bunding and Spill Management

- 4.4 The Applicant shall ensure that all bunding installed at the development site is constructed strictly in accordance with:
- all relevant Australian Standards;
 - a minimum bund volume requirement of 110% of the volume of the largest single stored volume within the bund; and
 - the EPA's Environment Protection Manual Technical Bulletin *Bunding and Spill Management*.

In the event of an inconsistency between the requirements listed from a) to c) above, the most stringent requirement shall prevail to the extent of the inconsistency.

Pre-Construction Studies

- 4.5 At least one month prior to the commencement of construction of the development (except for construction of those preliminary works that are outside the scope of the hazard studies), or within such further period as the Director-General may agree, the Applicant shall prepare and submit for the approval of the Director-General the studies set out under a) to c) below. Construction, other than preliminary works, shall not commence until approval has been given by the Director-General, and with respect to the Fire Safety Study, approval has also been given by the Commissioner of the NSW Fire Brigades.

- a) A **Fire Safety Study** shall be prepared for the development. This study shall cover all aspects detailed in the Department's *Hazardous Industry Planning Advisory Paper No.2 – Fire Safety Study Guidelines* and the New South Wales Government's *Best Practice Guidelines for Contaminated Water Retention and Treatment Systems*. The study shall also be submitted for approval to the NSW Fire Brigades. This study must include, but does not necessarily be limited to, the following:
 - i) Identification and consideration of possible fire incidents on the site;
 - ii) demonstration that the adopted fire safety measures (both infrastructure and management) are adequate and appropriate;
 - iii) consideration of the adequate provision of fire-fighting water in the event of a fire incident, and the site's capacity to contain contaminated fire-fighting water that may be generated.
- b) A **Final Hazard Analysis (FHA)** for the development. The analysis shall be prepared in accordance with the Department's *Hazardous Industry Planning Advisory Paper No.6 – Guidelines for Hazard Analysis*. The FHA shall include, but not necessarily be limited to, the following:
 - i) a table of all dangerous goods on the site with their storage location, maximum pack size, maximum on-site storage quantity and dangerous goods class. A similar table shall be included for those dangerous goods to be decanted on site and shall include initial and final pack sizes;
 - ii) details of the roof structure of warehouse B to demonstrate that it will be constructed to ensure that rocketing drum (in the event of a fire) will be contained within Warehouse B.
 - iii) calculated concentrations of toxics at the site boundary and at distances beyond to the nearest sensitive or residential zoned land for all credible scenarios. Where the concentrations are likely to cause irritation, injury or fatality, the frequencies and risk levels shall be developed and risk reduction measures suggested.
- c) A **Construction Safety Study** for the development, prepared in accordance with the Department's *Hazardous Industry Planning Advisory Paper No.7 – Construction Safety Study Guidelines*.

Pre-Commissioning Studies

- 4.6 No later than two months prior to the commencement of commissioning of the development, or within a period as the Director-General may agree, the Applicant shall prepare and submit for the approval of the Director-General the studies set out a) to c) below. Commissioning of the development shall not commence until approval has been given by the Director-General.
- a) A **Transport of Hazardous Materials** study for the development. The study shall address the arrangements covering the transport of hazardous materials including the details of routes to be used for the movement of vehicles carrying hazardous materials to or from the development. The study shall be carried out in accordance with the Department's draft *Route Selection* guidelines. Suitable routes identified in the study shall be used except where departures are necessary for local deliveries or emergencies.
 - b) A comprehensive **Emergency Plan** for the development. The Plan shall include detailed emergency procedures for the development, particularly the procedures to be followed to ensure the safety of all people outside of the development who may be at risk from the development. The plan shall be in accordance with the Department's *Hazardous Industry Planning Advisory Paper No.1 – Industry Emergency Planning Guidelines*. The Emergency Plan shall include, but not necessarily limited to the following:
 - i) specific procedures for spill management and external security risks (such as unauthorised access to the site, theft of dangerous goods and bomb threats); and
 - ii) details of equipment available on site for dealing with emergencies.

- c) A comprehensive **Safety Management System** for the development covering all operations on-site and associated transport activities involving hazardous materials. The Safety Management System shall be development in accordance with the Department's *Hazardous Industry Planning Advisory Paper No.9 – Safety Management*. The document shall clearly specify all safety related procedures, responsibilities and policies, along with details of mechanisms for ensuring adherence to procedures. Records shall be kept on-site and shall be available for inspection by the Director-General upon request.

- 4.7 Prior to the commencement of construction, the Applicant shall submit to the Director-General a **Security Management Plan** for the development. The Plan shall detail the specific security infrastructure to be installed at the site, including the operation of the security gates and video surveillance, procedures and protocols for tracking dangerous goods and a general program for identifying potential external risks and ensuring the security of the site. The Plan shall be prepared in consultation with Council, and with reference to the matters detailed in the Department's document *Crime Prevention and the Assessment of Development Applications*.

Traffic and Transport

Community Enhancement Program

- 4.8 Prior to the commencement of operation of the development or within such time as otherwise agreed by the Director-General, the Applicant shall negotiate an agreed outcome with Council for an appropriate level of contribution (financial or in-kind) and as applicable, towards mitigating any cumulative social and/or community impacts as the result of the proposed development

Should such negotiated outcome not be reached, either the Applicant or Council may refer the matter to the Minister for determination, despite the provisions of condition 1.7 of this consent. The Minister's determination of the matter shall be final and binding on all parties, and shall take into consideration any submission made by either party in relation to an estimate of a contribution based on the principles of nexus and reasonableness as to relevant cumulative social and/or community impacts

Site Access, Internal Roads and Parking

- 4.9 The Applicant shall ensure that all heavy vehicles access the site in a forward direction via the Holmes Road entrance and not via the Swettenham Road entrance. This condition does not apply during an emergency on the site and/ or under direction from a relevant authority (including the police and emergency services).
- 4.10 The Applicant shall develop and implement, in consultation with Council, a road hierarchy for heavy vehicles travelling to and from the site, with the Holmes Road, Ben Lomond Road, Airds Road, Rose Payten Drive, Campbelltown Road, and M5 Motorway forming the principal route to and from the site. The Applicant shall submit details of the road hierarchy for the approval of the Director-General prior to the commencement of operations on the site.
- 4.11 Prior to the commencement of operations, the Applicant shall submit for the Director-General's approval a **Transport Code of Conduct** for the development that outlines the management of traffic impacts associated with the development and minimum requirements for the movement of heavy vehicles to and from the site. The Code shall address the requirements of Council and shall include, but not necessarily be limited to:
- i) restrictions to routes, where relevant;
 - ii) restrictions to the hours of transport operations to avoid travelling through built-up areas late at night or at times of high traffic flows in those areas;
 - iii) minimum requirements for vehicle maintenance to address noise and exhaust emissions; and
 - iv) load coverage requirements.

- 4.12 Prior to the commencement of any transport to the site involving B-double vehicles, the Applicant shall demonstrate to the satisfaction of the Director-General that the B-double reclassification of Holmes Road has been approved by the RTA in association with Council.
- 4.13 The use of landscaping shall not affect driver sight distance for vehicles entering and exiting the site.
- 4.14 The Applicant shall design and construct all internal road works, including associated parking facilities and loading bays:
- in accordance with the relevant RTA and Council standards and codes, and Australian Standards including *AS 2890.1-1993* and *AS 2890.2-1989*;
 - with clearly marked visitor, disabled, ambulance and service vehicle parking areas; and
 - with signage to demarcate all vehicle movements within the site.

Road Works

- 4.15 ³The Applicant shall ensure that the deceleration lane at Swettenham Road entrance is designed in accordance with Council's *Specification for Construction of Subdivisional Road and Drainage Works* and that the land is constructed to the satisfaction of Council. The Applicant shall submit detailed engineering plans of the deceleration lane for the approval of Council prior to the commencement of any construction activities associated with Stage 1 of the development.
- 4.16 ⁴The Applicant shall ensure that a compensatory pedestrian footpath is designed and constructed to the satisfaction of Council. The pedestrian footpath shall be within the site boundaries along the length of the Swettenham Road deceleration lane. This footpath shall be dedicated to Council as a Public Road prior to the commencement of operations on the site.

Noise Impacts

Construction Noise

- 4.17 ⁵The Applicant shall ensure that all site preparation and construction activities associated with the development do not exceed the criteria at the nominated locations specified in Table 1. For the purpose of this condition, construction noise shall be determined at the locations under the conditions specified for operational noise, as provided in conditions 4.21 and 4.22 of this consent.

Table 1 – Construction Noise Criteria

Locations	Day
	L_{Aeq}(15 minute) (dB(A))
St Andrews Residences	46
Minto Residences	46

- 4.18 ⁶The Applicant shall ensure that site preparation and construction activities associated with the development do not exceed 62 dB(A)(L_{Aeq}(15 minute)) at the New Generation Childcare Centre, 30 Swettenham Road, St Andrews, during normal operating hours and/or occupation of the Childcare Centre.

³ Incorporates Campbelltown Council General Term of Approval (35)

⁴ Incorporates Campbelltown Council General Term of Approval (36)

⁵ Incorporates EPA General Terms of Approval (E1.1)

⁶ Incorporates EPA General Term of Approval (E1.1)

4.19 ⁷The Applicant shall only undertake noisy site preparation works and noisy construction activities (including transportation of fill and spoil) associated with the development, between the following hours:

- a) 7:00 am to 6:00 pm, Mondays to Fridays, inclusive;
- b) 8:00 am to 1:00 pm on Saturdays; and
- c) at no time on Sundays or public holidays.

For the purpose of this condition, “noisy” is any activity that may be audible at a residential receptor. This condition does not apply in the event of a direction from police or other relevant authority for safety reasons, or to avoid the loss of life, property or damage to the environment.

4.20 ⁸The hours of site preparation works and construction activities specified under condition 4.17 of this consent may be varied with the prior written approval of the Director-General. Any request to alter the hours of site preparation works or construction activities specified under condition 4.17 shall be:

- a) considered on a case-by-case basis;
- b) accompanied by details of the nature and need for activities to be conducted during the varied site preparation and construction hours;
- c) details of how potentially affected members of the community will be consulted and informed of the proposed varied site preparation and construction hours; and
- d) accompanied by written evidence of the EPA's agreement with the proposed variation in construction times, after providing any information necessary for the EPA to reasonably determine that activities undertaken during the varied construction hours will not adversely impact on the acoustic amenity of receptors in the vicinity of the site.

Operation Noise

4.21 ⁹The Applicant shall design, construct, operate and maintain the development to ensure that the noise contributions from the development to the background acoustic environment do not exceed the maximum allowable noise contributions specified in Table 2, at those locations and during those periods indicated. The maximum allowable noise contributions apply under:

- a) wind speeds up to 3 ms⁻¹ (measured at 10 metres above ground level); or
- b) temperature inversion conditions up to 3°C per 100 metres and wind speeds up to 2 ms⁻¹ (measured at 10 metres above ground level).

Table 2 - Maximum Allowable Noise Contribution

Location	Day 7:00am to 6:00pm Monday to Saturday 8:00am to 6:00pm Sundays and Public Holidays	Evening 6:00pm to 10:00pm on any day	Night 10:00pm to 7:00am Monday to Saturday 10:00pm to 8:00am Sundays and Public Holidays	
	L _{Aeq} (15 minute) (dB(A))	L _{Aeq} (15 minute) (dB(A))	L _{Aeq} (15 minute) (dB(A))	L _{A1} (1 minute) (dB(A))
St Andrews residences	36	36	36	50
Minto residences	36	36	36	50
Childcare Centre, 30 Swettenham Road	44	N/A	N/A	N/A

⁷ Incorporates EPA General Terms of Approval (E1.2 and E.13)

⁸ Incorporates EPA General Term of Approval (E1.3)

⁹ Incorporates EPA General Terms of Approval (L6.1, L6.2 and L6.5)

Measurement of Noise Impacts

- 4.22 ¹⁰For the purpose of assessment of noise contributions specified under condition 4.21 of this consent, noise from development shall be
- a) measured at the most affected point on or within the residential boundary to determine compliance with $L_{Aeq(15 \text{ minute})}$ noise limits; or
 - b) measured at 1 metre from the dwelling façade to determine compliance with $L_{A1(1 \text{ minute})}$ noise limits.

Soil and Water Impacts

- 4.23 ¹¹Except as may be expressly provided by an Environment Protection Licence for the development, the Applicant shall comply with section 120 of the *Protection of the Environment Operations Act 1997*, which prohibits the pollution of waters.

Soil, Contamination and Geotechnics

- 4.24 ¹²The Applicant shall ensure that all materials displaced during site preparation and construction works are stabilised or relocated and made secure so that these materials will not detrimentally affect any watercourse or riparian area.
- 4.25 Prior to the commencement of any site preparation or construction work on the site, the Applicant shall submit for the approval of the Director-General, a geotechnical assessment of the site to confirm the geotechnical suitability and long-term stability of the site. The geotechnical assessment shall be prepared by a suitably qualified person(s), and shall detail any additional measures that shall be implemented to ensure long-term stability, if required.
- 4.26 Prior to the commencement of any site preparation or construction work on the site, the Applicant shall submit for the approval of the Director-General, a contamination review of the site to confirm the presence, or otherwise, of any contamination on the site, and to demonstrate that any contamination on the site is not inconsistent with the development. The contamination review shall be prepared by a suitably qualified person(s), and shall detail any additional measures that shall be implemented to address contamination, if identified, and if required.
- 4.27 Depending on the outcome of the investigations required by condition 4.26, the Director-General may require the Applicant to prepare and implement a Soil Contamination Protocol to manage soil contamination during site preparation and construction works. The Protocol shall be submitted for the approval of the Director-General prior to the commencement of any works that may disturb contaminated soils and shall include procedures to adequately respond to any occurrences of contaminated soil disturbed during site preparation and construction works.

Bow Bowing Canal and Riparian Zone

- 4.28 ¹³The Applicant shall establish and maintain a riparian zone, consisting of local native plant species, in the area between the development and the watercourse within the property boundary. The zone shall be designed to ensure bed and bank stability of this area, and to prevent any sedimentation and water quality impacts on Bow Bowing Canal resulting from the development. The riparian zone shall be designed and constructed to meet the requirements of Department and shall be addressed as part of the Vegetation Construction Environmental Management Plan (condition 7.2d)).

¹⁰ Incorporates EPA General Terms of Approval (L6.3 and L6.4)

¹¹ Incorporates EPA General Term of Approval (L1.1)

¹² Incorporates DSNR General Term of Approval (9)

¹³ Incorporates DSNR General Term of Approval (12)

- 4.29 ¹⁴The Applicant shall maintain the riparian zone, as required by condition 4.28, for a period of at least two years after final planting. Every six months during that period the Applicant shall submit to the satisfaction of the Department, a status detailing the progress of implementation of the Vegetation Construction Environmental Management Plan (condition 7.2d)).
- 4.30 ¹⁵The Applicant shall design and construct any stormwater outlet structure located within 40 metres of Bow Bowing Canal to ensure that the structure that does not compromise the stability or function of the riparian zone. The design of any outlet structure within the riparian zone, including pipelines and spillways, shall be in accordance with the Department's guideline *Stormwater Outlet Structures to Streams* and shall be approved by the Director-General prior to the commencement of any construction works within the riparian zone.

Waste Generation and Management

- 4.31 ¹⁶The Applicant shall not receive waste at the site for storage, treatment, processing or reprocessing, and shall not dispose of waste generated by the development on the site, except as may be expressly permitted by an Environment Protection Licence for the development under the *Protection of the Environment Operations Act 1997*.

Note: This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if it requires an Environment Protection Licence under the *Protection of the Environment Operations Act 1997*

- 4.32 ¹⁷Except as provided by any Environment Protection Licence issued for the development, the Applicant shall ensure that only the following hazardous and/or industrial and/or Group A waste listed below are generated and/or stored at the site:
- i) acidic solutions or acids in solid form;
 - ii) basic solution or bases in solid form;
 - iii) non-toxic salts;
 - iv) zinc compounds;
 - v) waste oil/water, hydrocarbons/water mixtures or emulsions;
 - vi) containers that are contaminated with residues of substances referred to in the National Environment Protection (Movement of Controlled Wastes between States and Territories) Measure list of hazardous, industrial and liquid waste codes;
 - vii) surface active agents (surfactants), containing principally organic constituents and which may contain metals and inorganic materials;
 - viii) boron compounds;
 - ix) cadmium, cadmium compounds;
 - x) chromium compounds (hexavalent and trivalent);
 - xi) cobalt compounds;
 - xii) copper compounds;
 - xiii) ethers;
 - xiv) phenols, phenol compounds including chlorophenols;
 - xv) phosphorus compounds excluding mineral phosphates;
 - xvi) selenium, selenium compounds;
 - xvii) waste chemical substances arising from research and development or teaching activities including those which are not identified and/or are new and whose effects on human health and/or the environment are not known;
 - xviii) fire debris and fire washwaters;
 - xix) halogenated organic solvents;

¹⁴ Incorporates DSNR General Term of Approval (23 & 24)

¹⁵ Incorporates DSNR General Term of Approval (28)

¹⁶ Incorporates EPA General Term of Approval (L5.1)

¹⁷ Incorporates EPA General Term of Approval (L5.3)

- xx) inorganic fluorine compounds excluding calcium fluoride;
- xxi) inorganic sulfides;
- xxii) isocyanate compounds;
- xxiii) lead, lead compounds;
- xxiv) nickel compounds;
- xxv) organic phosphorous compounds;
- xxvi) organic solvents excluding halogenated solvents; and
- xxvii) waste mineral oils unfit for their original intended use.

4.33 ¹⁸The quantity of hazardous and/or industrial and/or Group A waste generated at the site per year shall not exceed 100 tonnes.

4.34 ¹⁹The quantity of hazardous and/or industrial and/or Group A waste stored at the site shall not exceed 50 tonnes at any one time.

Air Quality Impacts

Odour

4.35 ²⁰The Applicant shall design, construct, operate and maintain the development to prevent the emission of any offensive odour from the site that is attributable to the operation of the development. For the purpose of this condition, "offensive odour" has the same meaning as defined under the *Protection of the Environment Operations Act 1997*.

Note: Section 129 of the *Protection of the Environment Operations Act 1997* provides that the Applicant must not cause or permit the emission of any offensive odour from the site, but provides a defence if the emission is identified in the relevant Environment Protection Licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of the Licence directed at minimising odour.

Acetic Acid Scrubber

4.36 ²¹The Applicant shall design, construct, commission and operate the acetic acid scrubber to ensure that the emissions from the scrubber meet the requirements specified in the Environment Protection Licence issued for the development under the *Protection of the Environment Operations Act 1997*.

4.37 ²²Prior to the commencement of decanting activities involving acetic acid on the site, the Applicant shall submit to the Director-General and the EPA the manufacturer's performance guarantee and the detailed final design of the acetic acid scrubber. The guarantee shall be accompanied by an air quality assessment to predict the performance of the scrubber and to confirm that the final design of the scrubber is capable of achieve relevant ambient air quality criteria. The air quality assessment shall be undertaken in accordance with the EPA's *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW* (2001). Commencement of acetic acid decanting activities at the site shall not commence until the Director-General has approved the manufacturer's performance guarantee and air quality assessment, in consultation with the EPA.

¹⁸ Incorporates EPA General Term of Approval (L5.4)

¹⁹ Incorporates EPA General Term of Approval (L5.5)

²⁰ Incorporates EPA General Term of Approval (O1.1)

²¹ Incorporate EPA General Term of Approval (L3)

²² Incorporates EPA General Term of Approval (E4.2 & E4.3)

Dust Emissions

- 4.38 ²³The Applicant shall design, construct, commission, operate and maintain the development in a manner that minimises dust emissions from the site. All activities undertaken on the site shall be carried out in a manner that minimises the generation of dust, and emission of dust from the site, including wind-blown and traffic-generated dust.

Visual Amenity Impacts

- 4.39 The Applicant shall prepare an external design panel indicating the proposed external design finishes, material and configuration, in consultation with Council. The Applicant shall submit the design panel to the Director-General for approval prior to the commencement of the construction.
- 4.40 The Applicant shall ensure that all external lighting associated with the development is mounted, screened, and directed in such a manner so as not to create a nuisance to surrounding properties or roadways. The lighting must be the minimum level of illumination necessary and shall comply with *AS4282(INT) 1995 - Control of Obtrusive Effects of Outdoor Lighting*.
- 4.41 This consent does not permit the display of any advertisement, or the erection of any advertising structure, on the site. This condition does not apply to any advertisement or structure that cannot be seen from the nearest public place, nor any signage specified elsewhere in this consent (refer to condition 3.2).

Note: the Applicant may seek development consent from Council for the erection of advertising structures.

5. ENVIRONMENTAL MONITORING AND AUDITING

- 5.1 ²⁴The Applicant shall undertake all monitoring, including recording and reporting of monitoring results, as required under this consent and as may be specified in an Environment Protection Licence for the development.

Transport Auditing

- 5.2 Within 90 days of commissioning each stage of the development, and then as may be required by the Director-General, the Applicant shall commission an independent **Transport Audit** of the development. This Audit shall:
- a) be undertaken by a suitability qualified and experienced person, approved by the Director-General prior to the commencement of the Audit;
 - b) assess whether the heavy vehicles associated with the development are complying with the measures detailed in Traffic Management Plan (condition 7.5(b)) and as required by this consent; and,
 - c) if any non-compliance is detected, identify what additional measures will be implemented to ensure compliance.

The Applicant may, with the prior approval of the Director-General, utilise Global Positioning System technology as an alternative to the monitoring requirements set out above. In gaining this approval, the Applicant shall demonstrate to the Director-General the suitability of this technology and subsequent data analysis in fulfilling the requirements of this condition.

²³ Incorporate EPA General Terms of Approval (O2.1)

²⁴ Incorporates EPA General Terms of Approval (M1.1, M1.2 and M1.3)

- 5.3 Within 28 days of conducting the Audit referred to under condition 5.2 of this consent, the Applicant shall provide the Director-General and Council with a copy of the Transport Audit report. If the Audit identifies any non-compliance with the Transport Management Plan for the site or any conditions imposed under this consent, the Applicant shall detail what additional measures would be implemented to ensure compliance, clearly indicating who would implement these measures, when these measures would be implemented, and how the effectiveness of these measures would be measured and reported to the Director-General.

Noise Monitoring and Auditing

Construction Noise

- 5.4 ²⁵Within one month of the commencement of construction activities associated with each stage of the development, the Applicant shall submit to the Director-General and the EPA a **Construction Noise Audit** to demonstrate compliance with the construction noise limits specified in conditions 4.17 and 4.18 of this consent. The Audit shall be prepared by a suitably qualified acoustic consultant, approved by the Director-General prior to the commencement of the Audit. Should the Audit indicate that construction activities are above the set noise criteria, the report shall identify additional measures to be implemented to ensure compliance, clearly indicating who would implement these measures, when these measures would be implemented, and how the effectiveness of these measures would be measured and reported to the Director-General.
- 5.5 The Applicant may seek the Director-General's approval, in consultation with the EPA, to dispense with the requirement to undertake a Construction Noise Audit for stage 2, 3 and/ or 4 of the development. In seeking the Director-General's approval, the Applicant must demonstrate that:
- a) based on the Construction Noise Audit for stage 1, and the relevant Operational Noise Audits required under condition 5.6, that construction of stage 2, 3 and/ or 4 of the development, as relevant, will not generate a significant off-site noise impact;
 - b) no exceedances of construction noise criteria were experienced during construction of stage 1 of the development,
 - c) no community complaints were received in relation to noise generated from construction of stage 1 of the development; and
 - d) appropriate mechanisms are in place to monitor and manage noise during construction of stage 2, 3 and/ or 4 of the development, as relevant, and to respond to any community complaints that may be received in relation to noise during the construction of that stage(s).

Operational Noise

- 5.6 ²⁶Within 90 days of the commencement of operation of each stage of the development, and during a period in which the development is operating under design loads and normal operating conditions, the Applicant shall conduct an **Operational Noise Audit** of its operations. This Audit shall:
- a) be undertaken by a suitably qualified and experienced person;
 - b) assess whether the development is complying with the intrusive and amenity noise criteria; and, if any non-compliance is detected; and
 - c) identify what additional measures could be implemented to ensure compliance.
- 5.7 Within 28 days of conducting the Audit referred to under condition 5.6 of this consent, the Applicant shall provide the Director-General and EPA with a copy of the Noise Audit report. If the Audit identifies any non-compliance with the noise limits imposed under this consent, the Applicant shall detail what additional measures would be implemented to ensure compliance, clearly indicating who would implement these measures, when these measures

²⁵ Incorporates EPA General Term of Approval (E2.1)

²⁶ Incorporates EPA General Term of Approval (E2.2)

would be implemented, and how the effectiveness of these measures would be measured and reported to the Director-General.

Stormwater Quality Monitoring

5.8 Prior to the commencement of operations at the site, the Applicant shall submit for the approval of the Director-General, in consultation with Council, a Stormwater Quality Monitoring Program. This Program shall form part of the Stormwater Operational Environmental Management Plan required by condition 7.5(c). The Program shall include, but not necessarily be limited to:

- a) identification of contaminants to be tested, including those required under the Clean Water Regulation (Class R Classification);
- b) monitoring frequencies; and
- c) methodologies for stormwater quality monitoring.

The Stormwater Quality Monitoring Program shall be submitted for the approval of the Director-General prior to the commencement of operation of the development.

Air Quality Monitoring and Auditing

Acetic Acid Scrubber

5.9 ²⁷The Applicant shall periodically determine the pollutant concentrations discharged from the acetic acid scrubber, as established a part of the air quality performance confirmation required under condition 4.37 of this consent and at the frequency indicated in the Table 3. All monitoring shall be carried out strictly in accordance with *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW* (NSW EPA, 2001).

Table 3 – Pollutant and Parameter Monitoring (Air)

Pollutant	Units of Measures	Frequency	Method
Acetic Acid	mg/m ³	Quarterly	As determined by the EPA

5.10 Within 90 days of commencing acetic acid decanting activities at the site, and during a period in which the decanting area is operating under design loads and normal operating conditions, the Applicant shall conduct an **Air Quality Audit** of its operations to confirm the air emission performance of the acetic acid scrubber. The program shall include, but not necessarily be limited to:

- (i) point source emission sampling and analysis subject to the requirements listed under condition 5.9;
- (ii) a comprehensive air quality impact assessment, using actual air emission data collected under a). The assessment shall be undertaken strictly in accordance with the methods outlined in *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2001);
- (iii) a comparison of the results of the air quality impact assessment required under ii) above, and the predicted air quality impacts detailed in the documents listed under condition 4.36 of this consent;
- (iv) a comparison of the results of the air quality impact assessment required under ii) above, and the impact assessment criteria detailed in *Approved Methods and Guidance for the Sampling and Analysis of Air Pollutants in New South Wales* (EPA, 2001); and
- (v) details of any entries in the Complaints Register (condition 0 of this consent) relating to air quality impacts.

²⁷ Incorporates EPA General Term of Approval (M1)
NSW Government
Department of Infrastructure, Planning and Natural Resources

- 5.11 Within 28 days of conducting the Audit referred to under condition 5.10 of this consent, the Applicant shall provide the Director-General and EPA with a copy of the Air Quality Audit report. If the Audit identifies any non-compliance with the relevant air emission limits imposed on the development, the Applicant shall detail what additional measures would be implemented to ensure compliance, clearly indicating who would implement these measures, when these measures would be implemented, and how the effectiveness of these measures would be measured and reported to the Director-General.

Independent Hazard Auditing

- 5.12 Twelve months after the commencement of operation of Stage 1 of the development, or within such period otherwise agreed by the Director-General, the Applicant shall commission an independent, qualified person or team to undertake a Hazard Audit of the development. The independent person or team shall be approved by the Director-General prior to the commencement of the Audit. A **Hazard Audit Report** shall be submitted for the approval of the Director-General no later than one month after the completion of the Audit.

Further Hazard Audits shall be undertaken every three years or within 12 months of commissioning Stages 2, 3 and 4 of the development (whichever is the lesser), or as otherwise directed by the Director-General. Hazard Audits shall be carried out in accordance with the Department's publication *Hazardous Industry Planning Advisory Paper No. 5 - Hazard Audit Guidelines*, and shall include a review of the site safety management system and a review of all entries made in the incident register since the previous audit.

Independent Environmental Auditing

- 5.13 Twelve months after the commencement of operations of each stage of the development, and every three years thereafter, or as otherwise agreed or required by the Director-General, the Applicant shall commission an independent, qualified person or team to undertake an Environmental Audit of the development. The independent person or team shall be approved by the Director-General prior to the commencement of the Audit. An **Environmental Audit Report** shall be submitted for comment to the Director-General, the EPA and Council within one month of the completion of the Audit. The Audit shall:
- a) be carried out in accordance with *ISO 14010 - Guidelines and General Principles for Environmental Auditing* and *ISO 14011 - Procedures for Environmental Auditing*;
 - b) assess compliance with the requirements of this consent, and other licences and approvals that apply to the development;
 - c) assess the environmental performance of the development against the predictions made and conclusions drawn in the documents referred to under condition 1.2 of this consent; and
 - d) review the effectiveness of the environmental management of the development, including any environmental impact mitigation works.

The Director-General may require the Applicant to undertake works to address the findings or recommendations presented in the Report. Any such works shall be completed within such time as the Director-General may require.

Note: if the preparation and submission of a Hazard Audit Report and an Environmental Audit Report are required at the same time, the requirements of condition 5.12 and 5.13 of this consent may be satisfied with a single report prepared by a single independent person or team approved by the Director-General.

6. COMMUNITY INFORMATION, CONSULTATION AND INVOLVEMENT

- 6.1 Subject to confidentiality, the Applicant shall make all documents required under this consent available for public inspection on request.

Complaints Procedure

- 6.2 Prior to the commencement of construction of the development, the Applicant shall ensure that the following are available for community complaints:
- a) a 24-hour, toll-free telephone number on which complaints about the development may be registered;
 - b) a postal address to which written complaints may be sent; and
 - c) an email address to which electronic complaints may be transmitted.

The telephone number, the postal address and the email address shall be advertised on at least one occasion prior to the commencement of construction of each stage of the development, through a medium approved by the Director-General. These details shall also be provided on the Applicant's internet site, should one exist. The telephone number, the postal address and the email address shall be maintained throughout the life of the development.

- 6.3 The Applicant shall record details of all complaints received through the means listed under condition 6.2 of this consent in an up-to-date Complaints Register. The Register shall record, but not necessarily be limited to:
- a) the date and time, where relevant, of the complaint;
 - b) the means by which the complaint was made (telephone, mail or email);
 - c) any personal details of the complainant that were provided, or if no details were provided, a note to that effect;
 - d) the nature of the complaint;
 - e) any action(s) taken by the Applicant in relation to the complaint, including any follow-up contact with the complainant; and
 - f) if no action was taken by the Applicant in relation to the complaint, the reason(s) why no action was taken.

The Complaints Register shall be made available for inspection by the Director-General upon request.

Community Communication Strategy

- 6.4 Prior to the commencement of operations at the site, the Applicant shall prepare and implement a Community Communication Strategy for the development. This strategy shall be designed to enable the Applicant to respond to any community enquiries and to provide mechanisms to inform the local community as to the nature and operational environmental performance of the facility. The Strategy shall be prepared in consultation with Council and shall include, but does not necessarily be limited to:
- a) mechanisms through which the Applicant can report to the local community on the operations of the development and its environmental and safety performance;
 - b) mechanisms through which the community can provide feedback to the Applicant in relation to the environmental and safety management of the development; and
 - c) mechanisms through which the Applicant can respond to any enquiries or feedback from the community in relation to the environmental and safety performance and the nature of operations at the development.

The Strategy shall be approved by the Director-General prior to the commencement of any operations at the site.

7. ENVIRONMENTAL MANAGEMENT

Environmental Representative

7.1 Prior to the commencement of construction of the development, the Applicant shall nominate a suitably qualified and experienced Environmental Representative(s). The Applicant shall employ the Environmental Representative(s) on a full-time basis during the construction, commissioning and operation of the development. The Environmental Representative shall be:

- a) the primary contact point in relation to the environmental performance of the development;
- b) responsible for all Management Plans and Monitoring Programs required under this consent;
- c) responsible for considering and advising on matters specified in the conditions of this consent, and all other licences and approvals related to the environmental performance and impacts of the development;
- d) responsible for receiving and responding to complaints in accordance with condition 0 of this consent; and
- e) given the authority and independence to require reasonable steps be taken to avoid or minimise unintended or adverse environmental impacts, and failing the effectiveness of such steps, to direct that relevant actions be ceased immediately should an adverse impact on the environment be likely to occur.

The Applicant shall notify the Director-General of the name and contact details of the Environmental Representative upon appointment, and any changes to that appointment that may occur from time to time.

Construction Environmental Management Plan

7.2 The Applicant shall prepare and implement a **Construction Environmental Management Plan** to outline environmental management practices and procedures to be followed during the site preparation and construction activities during each stage of the development. The Plan shall include, but not necessarily be limited to:

- a) a description of all activities to be undertaken on the site during site preparation and construction activities, including an indication of stages of construction, where relevant;
- b) statutory and other obligations that the Applicant is required to fulfil during site preparation and construction activities of the development, including all approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies;
- c) details of how the environmental performance of the site preparation and construction works will be monitored, and what actions will be taken to address identified adverse environmental impacts. In particular, the following environmental performance issues shall be addressed in the Plan:
 - i) measures to monitor and control noise emissions during construction, commissioning and demolition;
 - ii) measures to monitor and minimise soil erosion and the discharge of sediment and other pollutants to lands and/ or waters during site preparation and construction activities;
 - iii) measures to monitor and manage traffic impacts resulting from road works and general construction activities;
 - iv) measures to monitor and manage dust emissions;
 - v) measures to establish and maintain a riparian zone to minimise water quality impacts for the life of the development;
 - vi) measures to minimise the generation of construction waste, and to manage any waste in an acceptable and appropriate manner;
- d) a description of the roles and responsibilities for all relevant employees involved in the construction of the development;
- e) the Management Plans listed under condition 7.3 of this consent; and

- f) complaints handling procedures during construction and demolition.

The Plan shall be submitted for the approval of the Director-General no later than one month prior to the commencement of any site preparation and construction works associated with the development, or within such period otherwise agreed by the Director-General. Site preparation and construction works associated with any stage of the development shall not commence until written approval has been received from the Director-General for that stage.

7.3 As part of the Construction Environmental Management Plan for the development, required under condition 7.2 of this consent, the Applicant shall prepare and implement the following Management Plans:

- a) ²⁸**A Noise Management Plan** to detail to outline measures to minimise and mitigate noise impacts on surrounding land uses as a result of the construction of the development. The Plan shall be prepared in consultation with Council, and shall be submitted to the EPA prior to the commencement of any construction activities. The Plan shall include, but not necessarily be limited to:
- (i) identification of construction noise criteria for each relevant receiver;
 - (ii) identification of general activities that will be carried out and associated noise sources;
 - (iii) assessment of construction noise impacts at the relevant receivers;
 - (iv) procedures for notifying residents of construction activities likely to affect their noise amenity, and procedures for receiving and responding to construction noise complaints;
 - (v) details of overall management methods and procedures that would be implemented to control noise from the construction stage to achieve the set construction noise criteria;
 - (vi) a description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating who would conduct the monitoring, how often this monitoring would be conducted, how the results of this monitoring would be recorded; and if any non-compliance is detected,
 - (vii) a description of what procedures would be followed to ensure compliance.
- b) ²⁹**a Transport Management Plan** to detail measures to ensure road works and construction activities are undertaken in a manner that does not adversely impact on the performance and safety of local roads. The Plan shall be prepared in consultation with Council, and shall include, but not necessarily be limited to:
- (i) details of construction volumes, peak delivery times and length of each construction period;
 - (ii) measures to be implemented to adequately mitigate the impact on the performance and safety of the surrounding network, particularly Swettenham Road during the construction of the deceleration lane. Reference should be made to *AS 1742-1985* in the preparation of these measures;
 - (iii) provide for the monitoring of the performance of the implemented measures and details of any additional measures that would be implemented should any non-compliance be detected.

²⁸ Incorporates an EPA General Term of Approval (E1.4)

²⁹ Incorporates Campbelltown Council General Term of Approval (47 & 48)
NSW Government

- c) ³⁰an **Erosion and Sedimentation Management Plan** to detail measures to minimise erosion during site preparation and construction works associated with the development. The Plan shall be approved by DSNR and submitted to the EPA prior to the commencement of any construction or site preparation activities. The Plan shall include, but not necessarily be limited to:
- i) results of investigations into soils associated with the site, in particular the stability of the soil and its susceptibility to erosion;
 - ii) details of erosion, sediment and pollution control measures and practices to be implemented during construction of the development;
 - iii) demonstration that erosion and sediment control measures will conform with, or exceed, the relevant requirements of the Department of Housing's *Managing Urban Stormwater: Soils and Construction* (1998), the Department's guideline *Stormwater Outlet Structures to Streams* and any relevant Council guideline;
 - iv) design specifications for diversionary works, banks and sediment basins;
 - v) an erosion monitoring program during construction and demolition works associated with the development; and
 - vi) measures to address erosion, should it occur, and to rehabilitate/ stabilise disturbed areas of the site.
- d) ³¹A **Vegetation Management Plan** to detail measures to establish, rehabilitate and maintain a designated riparian zone in order to minimise erosion and sedimentation during construction and operational stages of development. The Plan shall be approved by DSNR prior to the commencement of any construction or site preparation works, and shall be prepared in accordance with the Department's guideline *How to Prepare a Vegetation Management Plan*. The plan shall include, but not necessarily be limited to:
- i) description of the existing conditions of the riparian zone, and a vegetation plan detailing the proposed rehabilitation or establishment of vegetation within the zone;
 - ii) maximisation of flora species endemic to the locality in landscaping the zone;
 - iii) outline of the performance criteria for the established riparian zone;
 - iv) details of the maintenance program to ensure the effective management of the zone and vegetation;
 - v) description of the monitoring program to evaluate the performance of the zone and the need for additional vegetation; and should any deficiencies or non-compliance be detected,
 - vi) details of any additional management measures that would be implemented to address any performance deficiencies or non-compliance.

³⁰ Incorporates DSNR General Term of Approval (30-32) and EPA General Term of Approval (E5.1)

³¹ Incorporates a DSNR General Term of Approval

Operation Environmental Management Plan

7.4 The Applicant shall prepare and implement an **Operation Environmental Management Plan** to detail an environmental management framework, practices and procedures to be followed during the operation of the development. The Plan shall include, but not necessarily be limited to:

- i) identification of all statutory and other obligations that the Applicant is required to fulfil in relation to operation of phase 1 of the development, including all consents, licences, approvals and consultations;
- ii) a description of the roles and responsibilities for all relevant employees involved in the operation of the development;
- iii) overall environmental policies and principles to be applied to the operation of the development;
- iv) standards and performance measures to be applied to the development, and a means by which environmental performance can be periodically reviewed and improved, where appropriate;
- v) management policies to ensure that environmental performance goals are met and to comply with the conditions of this consent;
- vi) the Management Plans listed under condition 7.5 of this consent;
- vii) the environmental monitoring requirements outlined under conditions 5.8 and 5.9 of this consent, inclusive.

The Plan shall be submitted for the approval of the Director-General no later than one month prior to the commencement of operation of stage 1 of the development, or within such period otherwise agreed by the Director-General. Operation shall not commence until written approval has been received from the Director-General.

7.5 As part of the Operation Environmental Management Plan for the development, required under condition 7.4 of this consent, the Applicant shall prepare and implement the following Management Plans:

- a) a **Noise Management Plan** to outline measures to manage noise impacts associated with the operation of the development. The Plan shall be submitted to the EPA and shall address the requirements of Council. The Plan shall include, but not necessarily be limited to:
 - i) identification of the potential sources of noise during the site operations;
 - ii) specification of the noise criteria for these operations;
 - iii) a detailed description of what actions and measures would be implemented to ensure that operations would comply with specified noise criteria; and
 - iv) a description of how the effectiveness of actions and measures would be monitored over time; and
 - v) if any non-compliance is detected what procedures would be followed to ensure compliance;
- b) ³²a **Transport Management Plan** to outline measures to ensure minimal amenity impacts on the locality through the appropriate management of heavy vehicles accessing and departing the development. The Plan shall be submitted to the EPA and prepared in consultation with Council. The Plan shall include, but not necessarily be limited to:
 - i) details of measures that would be implemented to minimise noise and amenity impacts on residential areas resulting from heavy vehicle movements, including those required by condition 4.9 and condition 4.12;
 - ii) consideration of all possibilities for reducing the required daily heavy vehicle movements and movements during peak or night-time periods;
 - iii) procedures for monitoring the effectiveness and suitability of these measures, particularly the periodic and random monitoring of heavy vehicle routes; and
 - iv) details of additional measures that would be implemented should be non-compliance be detected.

³² Incorporates EPA General Term of Approval (E3.1)
NSW Government
Department of Infrastructure, Planning and Natural Resources

- c) ³³a **Stormwater Management Plan** to outline measures to mitigate impacts of stormwater run-off from and within the premises. This plan shall be submitted to the EPA, and prepared in consultation with Council. This plan shall include, but not necessarily be limited to:
- (i) details of all relevant stormwater control infrastructure and how that infrastructure minimise stormwater peak flows and peak pollutant concentrations;
 - (ii) procedures for the installation and maintenance of gross pollutant traps to screen stormwater from the site;
 - (iii) a demonstration of consistency with the stormwater management plan for the catchment and any relevant stormwater guidelines prepared by Council;
 - (iv) details of the monitoring program, as required by condition 5.8, to monitor stormwater flows from the site to meet discharge requirements for Class C (Controlled) Waters under the *Clean Water Regulations*; and
 - (v) details of contingency measures that would be followed to ensure the protection of Bow Bowing Canal, should an accident or emergency occur at the site.
- d) a **Waste Management Plan** to outline measures to ensure the appropriate handling, storage and disposal of wastes generated during operations at the site. The plan shall be prepared in consultation with Council, and shall include, but not necessarily be limited to:
- (i) identification of the types and quantities of waste that would be generated during operations, and the areas in which waste will be stored prior to removal;
 - (ii) standards and performance measures for dealing with this waste;
 - (iii) a detailed description of how this waste would be reused, recycled and, if necessary, appropriately treated and disposed of in accordance with the EPA's guidelines on the *Assessment, Classification and Management of Liquid and Non-Liquid Waste*;
 - (iv) a description of how the effectiveness of these actions and measures would be monitored over time; and
 - (v) a description of what procedures would be followed to ensure compliance if any non-compliance is detected.
- e) a **Landscape Management Plan** to outline measures to ensure appropriate development and maintenance of landscaping on the site. The Plan shall include, but not necessarily be limited to:
- i) details of all landscaping to be undertaken on the site with specific reference to revegetation along the riparian zone (condition 4.28);
 - ii) maximisation of flora species endemic to the locality in landscaping the site;
 - iii) a program to ensure that all landscaped areas on the site are maintained in a tidy, healthy state.

7.6 At least one month prior to the operation of Stage 2, Stage 3 and Stage 4 of the development, the Applicant shall update and submit for the approval of the Director-General, the Operation Environmental Management Plan referred to under condition 7.4 of this consent. Operation of Stage 2, Stage 3 and Stage 4, respectively, shall not commence until the Director-General has approved the updated Plans.

³³ Incorporates EPA General Term of Approval (E5.2)
 NSW Government
 Department of Infrastructure, Planning and Natural Resources

8. ENVIRONMENTAL REPORTING

Incident Reporting

- 8.1 The Applicant shall notify the EPA and the Director-General of any incident with actual or potential significant off-site impacts on people or the biophysical environment as soon as practicable after the occurrence of the incident ("initial notification"). The Applicant shall provide written details ("written report") of the incident to the EPA and the Director-General within seven days of the date on which the incident occurred.
- 8.2 The Applicant shall meet the requirements of the Director-General to address the cause or impact of any incident, as it relates to this consent, reported in accordance with condition 8.1 of this consent, within such period as the Director-General may require.

Note: Condition 8.2 of this consent does not limit or preclude the EPA from requiring any action to address the cause or impact of any incident, in the context of the EPA's statutory role in relation to the development.

Annual Performance Reporting

- 8.3 The Applicant shall, throughout the life of the development, prepare and submit for the approval of the Director-General, an **Annual Environmental Management Report (AEMR)**. The AEMR shall review the performance of the development against the Operation Environmental Management Plan (refer to condition 7.4 of this consent), the conditions of this consent and other licences and approvals relating to the development. The AEMR shall include, but not necessarily be limited to:
- a) details of compliance with the conditions of this consent;
 - b) a copy of the Complaints Register (refer to condition 0 of this consent) for the preceding twelve-month period (exclusive of personal details), and details of how these complaints were address and resolved;
 - c) a comparison of the environmental impacts and performance of the development against the environmental impacts and performance predicted in those documents listed under condition 1.2 of this consent;
 - d) results of all environmental monitoring required under this consent and other approvals, including interpretations and discussion by a suitably qualified person; and
 - e) a list of all occasions in the preceding twelve-month period when environmental performance goals for the development have not been achieved, indicating the reason for failure to meet the goals and the action taken to prevent recurrence of that type of incident.

The Applicant shall submit a copy of the AEMR to the Director-General every year, with the first AEMR to be submitted no later than twelve months after the commencement of operation of the development. The Director-General may require the Applicant to address certain matters in relation to the environmental performance of the development in response to review of the Annual Environmental Report. Any action required to be undertaken shall be completed within such period as the Director-General may require.

**TRAFFIC AND PARKING
IMPACT ASSESSMENT REPORT**

**FOR
DEVELOPMENT OF STAGE 4
OF
REDOX PTY LTD
CHEMICAL LOGISTICS SITE**

**AT
2 SWETTENHAM ROAD**

MINTO

Ref. 14228r2

August 2016

Prepared By



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CONTENTS

1.0	INTRODUCTION	1
2.0	DEVELOPMENT PROPOSAL	2
2.1	Proposed Building	2
2.2	Proposed Access	2
3.0	EXISTING SITE DETAILS	2
3.1	Site Location & Access	2
3.2	Existing Use	3
3.3	Adjoining Development	3
3.4	Site Parking and Manoeuvring Areas	3
4.0	EXISTING TRAFFIC CONDITIONS	4
4.1	Road Network	4
4.2	Truck Routes	6
5.0	TRAFFIC GENERATION AND IMPACT	6
5.1	Existing Trips	6
5.2	Future Trips	9
5.3	Proposed Truck Routes	10
5.3.1	Route Lengths	10
5.3.2	Assessment of Proposed Northern Truck Route	11
5.3.3	Traffic Impact of New Northern Truck Route	11
5.3.4	Proposed New Southern Truck Route	12
5.4	Proposed Internal Traffic Arrangements	13
6.0	CONCLUSION	14

- Figure 1** Site Location
Figure 2 Subject Site
Figure 3 Road Network
Figure 4 Existing Truck Routes
Figure 5 Proposed Truck Routes

Appendix A Transport Code of Conduct
Heavy Vehicle Routes

Appendix B Site Plan

1.0 INTRODUCTION

Transport and Urban Planning Pty Ltd have been commissioned by Benbow Environmental, on behalf of Redox Pty Ltd, to provide a traffic and parking impact assessment report for additions to the existing Redox premises at 2 Swettenham Road, Minto.

The Redox site is a large chemical logistics facility originally approved as a State Significant Project in 2003 by the Minister for Infrastructure and Planning. The development was approved as a 4 stage project and Stages 1, 2 and 3 have been completed. This new application is for Stage 4, with a request to modify the consent conditions for changes to types of chemicals to be stored and decanted and to modify heavy vehicle access routes. The proposed changes to these routes are the result of new road developments in the area.

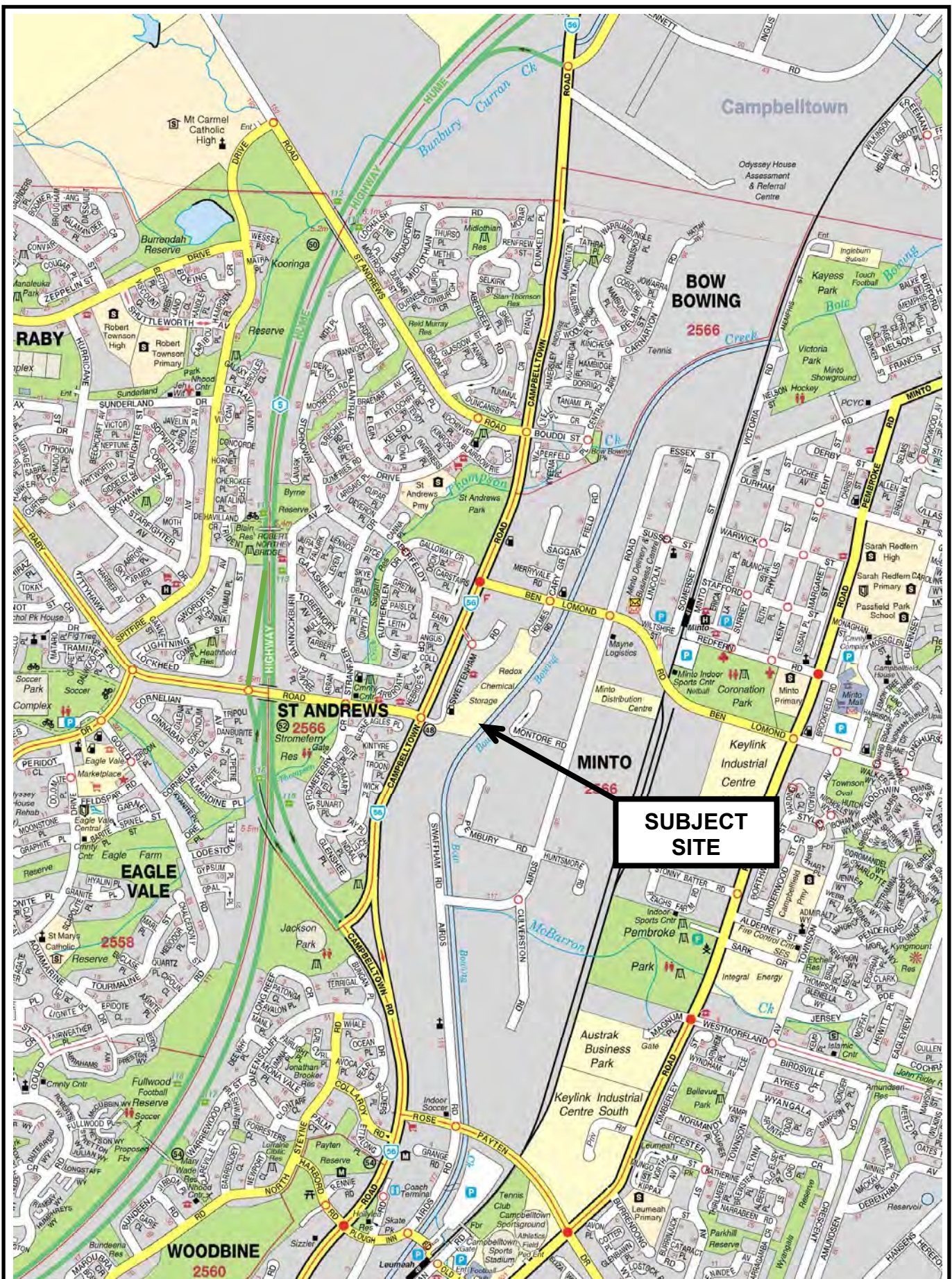
The site location is shown in **Figure 1**.

This report will evaluate the traffic, transport and parking aspects of the proposal. The report will address the following:

- Section 2 will outline the development proposal;
- Section 3 will describe the existing site and surrounding development;
- Section 4 will identify the existing traffic conditions around the site;
- Section 5 will assess the traffic generation of the proposal, proposed new truck access routes and the impact on the surrounding road network;
- Section 6 will present conclusions.

This assessment has been undertaken in accordance with the provisions of State Environmental Planning Policy Infrastructure, the RMS Guide to Traffic Generating Developments 2002, and with regard to relevant planning instruments adopted by Campbelltown City Council.

This report should be read in conjunction with the architectural drawings prepared by Algorry Zappia and Associates Pty Ltd.



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N



NOT TO SCALE

FIGURE 1

REDOX PTY LTD,
2 SWETTENHAM ROAD, MINTO

SITE LOCATION

JOB NO. 14228

2.0 DEVELOPMENT PROPOSAL

2.1 Proposed Building

The Redox development at Minto was approved as a State Significant Project in 2003 as a 4 stage development. Stages 1, 2 and 3 have been completed for some time. Stage 4 involves an infill building near the centre of the site. **Figure 2** shows the existing buildings on the site and the location of the proposed infill.

Stage 4 was approved as a roofed decanting area and tank farm for certain chemicals including dangerous goods. It is now proposed to construct and operate this facility with the only changes being the types of chemicals that would be decanted and stored, as a result of changed commercial and industry requirements.

For the purposes of this traffic and parking assessment report, the proposed change to internal operational details has no affect on the traffic generation, internal traffic operations, parking or external traffic impacts to the previously approved Stage 4.

2.2 Proposed Access

Vehicular access to the site will remain unchanged. The site is divided into 2 sections. The industrial section occupies the north end of the site and has a combined two way driveway at the end of Holmes Road, which is a short cul-de-sac leading to Ben Lomond Road. The driveway width varies between 10.5m and 9.5m wide, and leads to a site access gate about 40 metres inside the property boundary. This initial driveway length is designed to allow large trucks to enter the site and fully clear Holmes Road before being required to stop. Inside the gate a 9.5m wide internal access road continues a further 80 metres to the main industrial buildings and truck manoeuvring areas.

The southern section of the site is an office building which contains the Redox head office. This building has a separate vehicular access to Swettenham Road. An internal connecting road has been constructed between the industrial and office components of the site, however this road is usually kept closed by an emergency access gate.

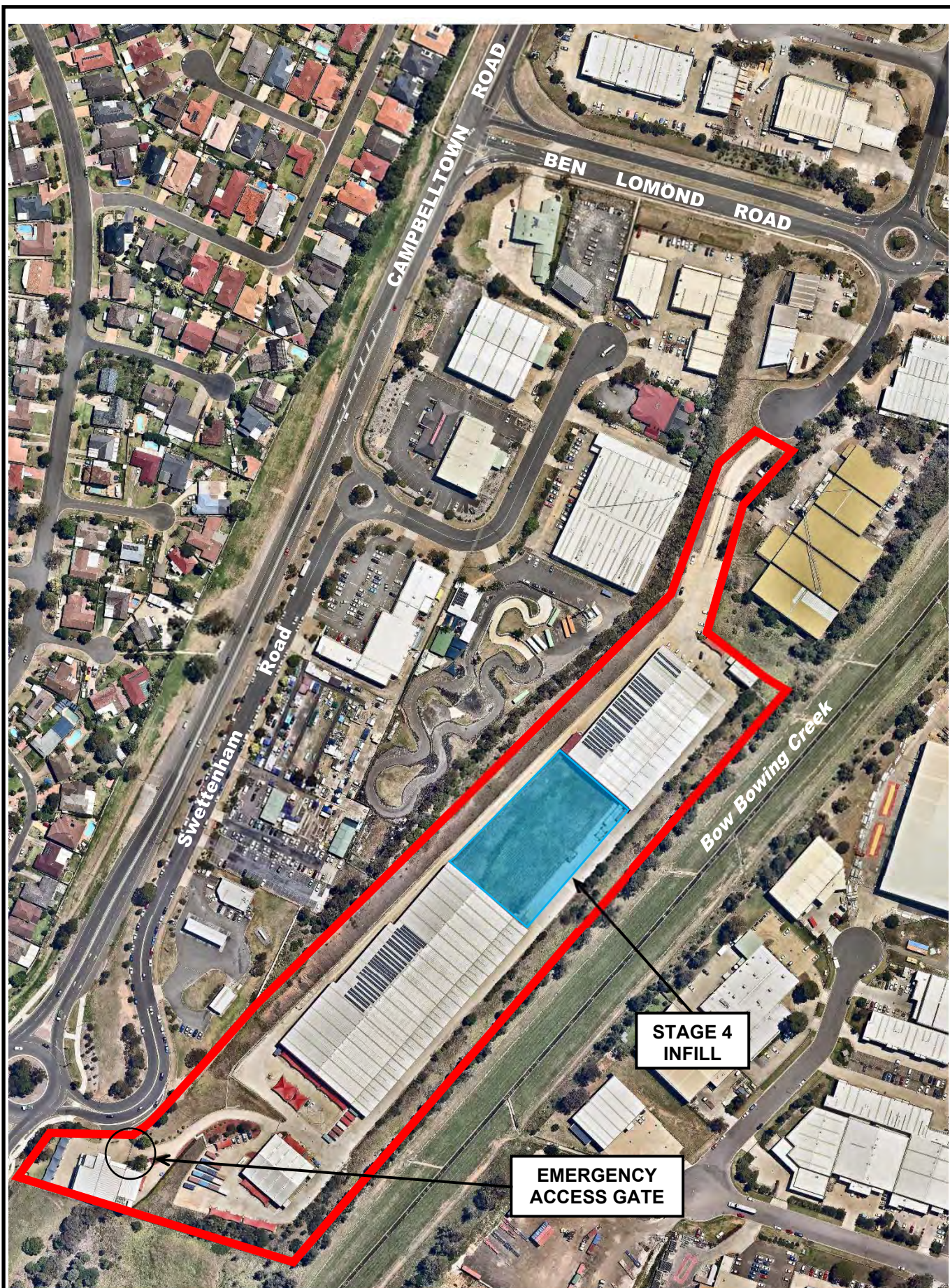
A current consent condition requires that all heavy vehicles access the site via the Holmes Road entrance, not the Swettenham Road entrance, except in case of emergency. The proposed access arrangements will continue to be in accordance with this requirement.

3.0 EXISTING SITE DETAILS

3.1 Site Location & Access

The subject site is on a 6 hectare elongated parcel of land running north east / south west between Holmes Road in the north to Swettenham Road near its intersection with Campbelltown Road and Raby Road. It is located on the western edge of the Minto industrial estate, running along the west side of Bow Bowing Creek and is about 700 metres west of Minto rail station.

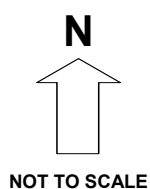
As described in Section 2.2, the site has access at each end via Holmes Road and Swettenham Road, however the industrial component of the site only has access to



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NOT TO SCALE

FIGURE 2
 REDOX PTY LTD,
 2 SWETTENHAM ROAD, MINTO
STAGE 4 DEVELOPMENT AREA
 JOB NO. 14228

the north, onto Holmes Road, which leads to the classified road system via Ben Lomond Road.

3.2 Existing Use

The Redox site is a large chemical logistics operation, including the Redox head office in a separate 3-storey office building at the southern end of the site. The industrial component of the site is an approved chemical storage and distribution facility and includes a 2-storey transport office for warehouse and transport staff. In terms of traffic generation, the site generates up to about 60 truck movements in and the same number out per day (full traffic generation details are provided in Section 5).

3.3 Adjoining Development

The site is in the Minto industrial area. To the east is Bow Bowing Creek which is a major stormwater channel, and several large factory developments are located on the eastern side of the channel. North of the site, along Holmes Road, are 2 moderate sized factories and a retail tyre outlet, while a service station and other factories are located on the intersection of Holmes Road and Ben Lomond Road. East of the site, between the site and Campbelltown Road, are mixed used industrial and commercial developments. South of the site is an undeveloped industrial property which is currently vacant but has previously been used for bulk storage of vehicles.

3.4 Site Parking and Manoeuvring Areas

The Ministerial approval of the development in 2003 included approval of plans for the site showing parking and internal traffic arrangements that have since been fully constructed.

The existing internal traffic and parking arrangements for the site are shown on Algorry Zappia and Associates plan no. P1045, Sheet AO1 dated 20 February 2015, a copy of which is included as Appendix B. The plan shows a total of 197 existing car parking spaces for the industrial component, a further 11 existing car spaces for the 3-storey office component, and a further 13 potential future spaces at the northern end of the site.

The car parking design layout and access meets the requirements of AS2890.1, Parking Facilities – Off Street Car Parking. It is noted that the design provides a significantly greater number of spaces than the site operation currently requires, with the current peak car parking occupancy observed to be about 60% of capacity. This verifies that the proposed Stage 4 development, which will only have a very small effect on total staff numbers on site, will not require any new car parking.

The internal traffic arrangements involve a simple one way clockwise flow around the main industrial building, with an additional loop to a rear car park around the flammable goods store building at the southern end of the site. This one way flow provides considerable safety, efficiency and operational advantages, particularly for the heavy vehicles using the site. Pedestrian safety is also enhanced by this one way traffic flow.

The entry security gate is located 40 metres inside the property boundary off Holmes Road, which allows up to 2 semi-trailers to enter the site and stop fully clear of Holmes Road.

The internal road widths and manoeuvring areas are well designed for vehicles up to and including B-doubles, and fully meet the requirements of AS2890.2, Parking Facilities – Off Street Commercial Vehicles.

4.0 EXISTING TRAFFIC CONDITIONS

4.1 Road Network

The surrounding road network, including the classified roads (Motorway, State and Regional) are shown on **Figure 3**.

Local Council roads that are currently used by vehicles accessing the subject site are:

Holmes Road

A 100 metre long cul-de-sac which is an access road from Ben Lomond Road to 4 industrial / commercial developments, including the Redox site. It is 12 metres wide between kerbs and the head of the cul-de-sac has a diameter of 30 metres, which allows articulated vehicles to turn around if required. The road is fully sealed with bitumen, is in good condition and provides a very good level of access to the site. Holmes Road carries low volumes of traffic.

Airds Road

A 2.5km long road running north / south from Ben Lomond Road, through the Minto Industrial area to Rose Payten Drive. It is generally a wide, straight and level road with two 90° intersections where it crosses Bow Bowing Creek. It has a 60km/h speed limit. This road serves as a collector road for numerous industrial developments in the area between Campbelltown Road and the Cumberland / Southern Highlands railway line. Airds Road carries low to moderate volumes of traffic.

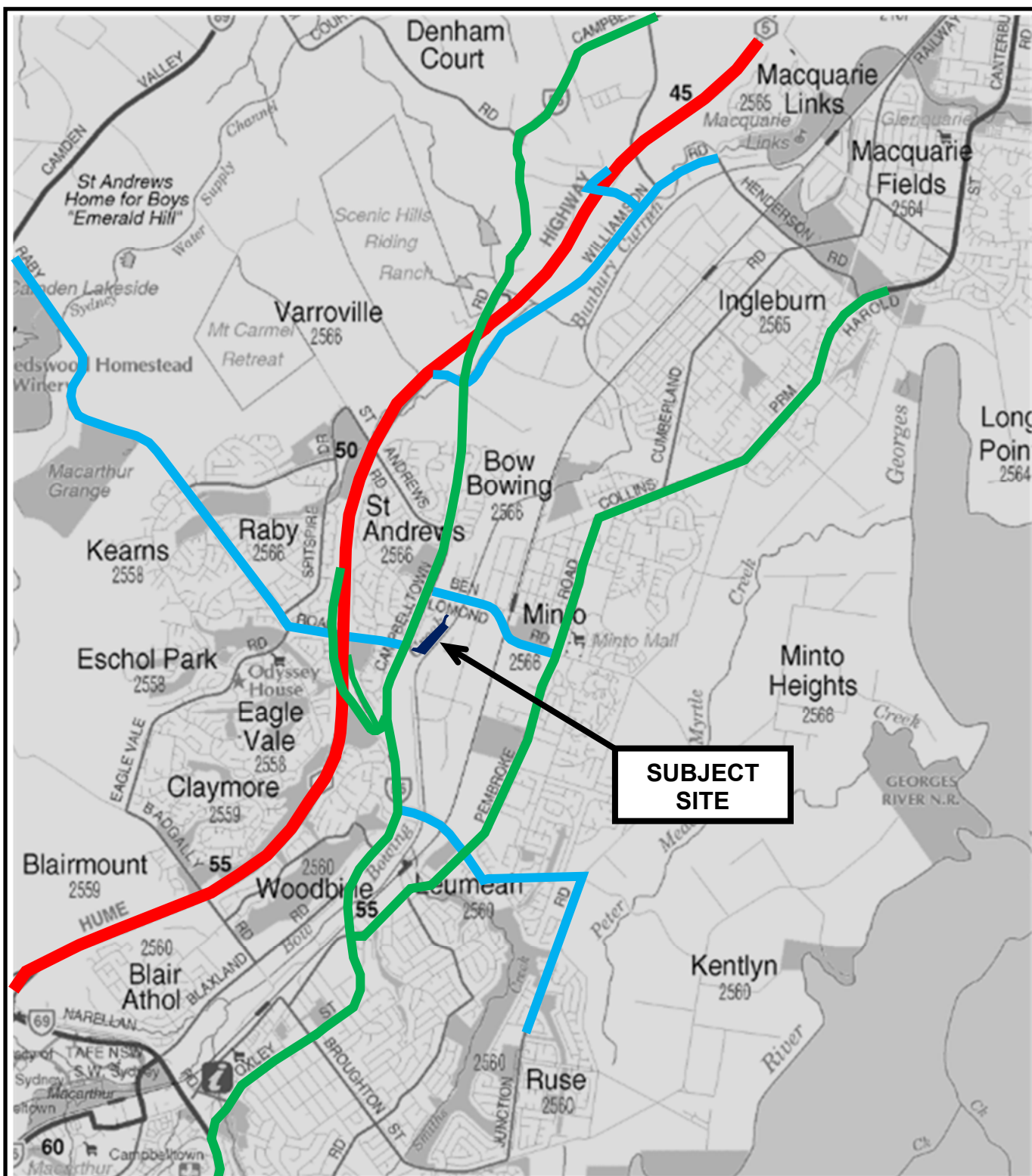
Classified roads that provide access to the site are:

Ben Lomond Road

A Regional Road running east/west from Campbelltown Road easterly past Holmes Road to Airds Road and further east to Pembroke Road. Intersection controls are:

- Traffic signals at Campbelltown Road;
- Roundabout (2-lane) at Holmes Road;
- Roundabout (2-lane) at Airds Road.

The section between Campbelltown Road and Ben Lomond Road is a 250 metre long divided carriageway, with 2 eastbound lanes and 3 westbound lanes. The section between Holmes Road and Airds Road is 270 metres long and is of variable width. It has 2 westbound lanes but only 1 eastbound lane over Bow Bowing Creek. It has a 60km/h speed limit. Ben Lomond Road carries moderate to high volumes of traffic.



KEY:

- MOTORWAY
- STATE ROAD
- REGIONAL ROAD

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FIGURE 3

REDOX PTY LTD,
 2 SWETTENHAM ROAD, MINTO

ROAD NETWORK

JOB NO. 14228

Campbelltown Road

This State Road is a major north / south arterial road running through the region. The road is a divided multilane high standard road carrying high traffic volumes. It provides an important linkage between other arterial and collector roads to the M31 Motorway. It has a 70km/h speed limit in the vicinity of the site. Key intersections near the site are:

- Traffic signals at Ben Lomond Road;
- Roundabout (2-lane) at Swettenham Road and Raby Road;
- Left turns only at the connection to M31 access ramps 900 metres south of Raby Road.

Raby Road

A Regional Road running from Campbelltown Road westerly to an M31 interchange, then further west to residential developments in Eschol Park, Eagle Vale and Raby. The section between Campbelltown Road and the M31 is 700 metres long and has a 2 lane roundabout at Stranraer Drive / Stromeferry Crescent at about the midpoint of that section. The M31 interchange is for northbound traffic entering the motorway only, and the on-ramp intersection consists of another 2 lane roundabout. Raby Road has a 60km/h speed limit and carries moderate to high traffic volumes between Campbelltown Road and the M31.

M31 Motorway

This major motorway forms part of the National Highway network, linking Sydney with Canberra and Melbourne. It is a divided multilane, high capacity road with a 110km/h speed limit. The nearby access points on and off the M31 to and from the north are:

Northbound On Ramp:

From Campbelltown Road, (1km south west of Redox site);

From Raby Road, (700m west of Redox site).

Southbound Off Ramp:

To Campbelltown Road, (1km south west of Redox site)

Almost all commercial traffic generated by the site travels to and from the north along the M31 Motorway.

Rose Payten Drive

A Regional Road used to link Airids Road to Campbelltown Road to the south of the site. This section is 200m long and is a divided carriageway with 2 lanes in each direction. The intersection with Airids Road is a 2 lane roundabout and at Campbelltown Road there are traffic signals.

4.2 Truck Routes

The Ministerial Determination of the development application in 2003 included conditions relating to heavy vehicle access to the site and routes to and from the site.

Condition 4.9 required all heavy vehicles to access the site via Holmes Road and not via the Swettenham Road entrance. As detailed in Section 2.2 of this report, the industrial section of the site has been constructed with access only to and from Holmes Road. The current and proposed development is fully compliant with Condition 4.9.

Condition 4.10 required heavy vehicles to use the following route as the principal route to and from the site:

Holmes Road, Ben Lomond Road, Airds Road, Rose Payten Drive, Campbelltown Road and the M5 Motorway (now the M31 Motorway).

Condition 4.11 required that a Transport Code of Conduct be developed by the applicant, to outline the minimum requirements for movement of heavy vehicles to and from the site. The Transport Code of Conduct was developed and contains the heavy vehicle routes to and from the site for vehicles from:

- The south
- The north
- Ingleburn Industrial Estate

A copy of the relevant section of the Transport Code of Conduct is included as Appendix A and it confirms that the roads listed in Condition 4.10 are documented as the principal heavy vehicle route to and from the site. The current development is therefore in compliance with Conditions 4.10 and 4.11.

A proposed variation to this principal heavy vehicle route will be analysed in Section 5.3 of this report.

5.0 TRAFFIC GENERATION AND IMPACT

5.1 Existing Trips

Due to the hazardous goods being processed on site, vehicular access to the industrial section of the site from Holmes Road is controlled and recorded. Redox have provided an hourly breakdown of vehicles by classification entering from Holmes Road over 2 typical weekdays. Table 5.1 shows these vehicle volumes. Note that these volumes are entering trips only and each entry will have a corresponding exit trip.

The table shows that the heavy vehicles are spread quite evenly throughout the day, which is scheduled by Redox. This is in response to Condition of Consent 4.11(ii) and is intended to mitigate against transport operations in built-up areas late at night or at times of high traffic flows.

TABLE 5.1 Vehicles Entering from Holmes Road

Date:	13/01/2015								
Time:		Car	Van	Small Rigid	Medium Rigid	Heavy Rigid	Truck & Dog	Semi Trailer	B-Double
From	To			max 6.4M	max 8.8M	max 12.8M	max 19M	max 19M	
0	1								
1	2								
2	3								
3	4								
4	5								
5	6	8							
6	7	4			2	3		1	
7	8	5							
8	9	32	1	1	2	2			
9	10	4		1	1	2		1	
10	11	2		1	3			1	
11	12	2			2	3		2	1
12	13	4				2		2	
13	14	11			1	6		1	
14	15		1		1	2		3	
15	16	1				2		3	1
16	17	1			1	2			
17	18				1	1			
18	19								
19	20	1							
20	21								
21	22								
22	23								
23	0								

Date:	21/01/2015								
Time:		Car	Van	Small Rigid	Medium Rigid	Heavy Rigid	Truck & Dog	Semi Trailer	B-Double
From	To			max 6.4M	max 8.8M	max 12.8M	max 19M	max 19M	
0	1								
1	2								
2	3								
3	4								
4	5	1							
5	6	4	1					1	
6	7	1				3		2	
7	8	11						1	
8	9	31			1			2	
9	10	1			1	2		3	1
10	11					4		3	
11	12	4			1	2	1	2	
12	13	4			1	3			
13	14	8			1	1		3	
14	15				3			2	
15	16				1	1			
16	17	1			1	3			
17	18					2		2	
18	19								
19	20	2							
20	21	1							
21	22								
22	23								
23	0								

The following Table 5.2 shows the average daily totals over the 2 surveyed days from the above information. Each class of truck is totalled and a summary of light vehicles and heavy vehicles is provided.

TABLE 5.2 Average Daily Totals of Vehicles Entering from Holmes Road

	Car	Van	Small Rigid max 6.4M	Medium Rigid max 8.8M	Heavy Rigid max 12.8M	Truck & Dog max 19M	Semi Trailer max 19M	B-Double
Average Daily Totals	72	1.5	1.5	12	23	0.5	17.5	1.5
	Light Vehicles		Heavy Vehicles					
	73.5		56					

The above information shows that on a typical weekday, 74 light vehicles and 56 heavy vehicles access the site from Holmes Road. These volumes are entering only, and because each vehicle enters and leaves the site, this equates to a total daily trip generation of:

- 148 light vehicle trips per day
- 112 heavy vehicle trips per day

AM and PM peak hours on the surrounding road network are 8am-9am and 5pm-6pm. The survey data only recorded vehicles as they entered the site. To assess all vehicle trips in each peak period, it will be assumed that all light vehicle movements will be inbound in the AM peak and outbound in the PM peak, while heavy vehicle movements will be equal in and out in both peaks.

Using the hourly data from Table 5.1, the existing peak hour trip generation of the site is:

AM Peak Hour

Entering Site:	32	light vehicle trips
	4	heavy vehicle trips
Departing Site:	nil	light vehicle trips
	<u>4</u>	heavy vehicle trips
Total trips:	32	light vehicle trips
	8	heavy vehicle trips

PM Peak Hour

Entering Site:	nil	light vehicle trips
	3	heavy vehicle trips
Departing Site:	32	light vehicle trips
	<u>3</u>	heavy vehicle trips
Total trips:	32	light vehicle trips
	6	heavy vehicle trips

5.2 Future Trips

The proposed Stage 4 infill development involves an additional GFA of about 2,135 sqm. and consists of warehousing / storage.

The RMS Guide to Traffic Generating Developments (2002) provides traffic generation rates for industrial developments, including for warehouses in Section 3.10.2. The RMS rates are:

Daily Vehicle trips: 4 per 100sqm GFA
AM Peak hour trips: 0.5 per 100sqm GFA

However, the RMS Guide also notes that “*vehicle generation rates vary substantially depending on the type of goods being warehoused.*” Table 3.5 of the RMS Guide shows that for a chemical products site both the employee and commercial trip generation rate is “low”. This is verified by the actual number of trips observed at the existing site. The existing AM peak hour total trips (as detailed in Section 5.1) is 40 (32 light vehicles, 8 trucks). Given the existing industrial development GFA of about 15,000sqm, this equates to an AM peak hour trip generation of 0.27 vehicle trips per 100sqm, i.e. about half the RMS Guide rate.

In addition to this low trip generation rate, an infill development which will comprise only about 12% of the total industrial site when completed is not likely to increase traffic generation as much as a new development of the same size. It is very likely that some vehicles making existing trips to the site will also use the new component as part of their current activity, thus reducing the additional trip generation of the current proposal.

This assessment therefore calculates the likely maximum additional traffic generation of the proposed development to be:

Daily vehicle trips	=	2 trips per 100sqm GFA
	=	2 x 21.35
	=	42.7 trips per day
		Say 44 trips per day (22 in, 22 out)

AM peak hour vehicle trips	=	0.27 per 100sqm GFA
	=	0.27 x 21.35
	=	5.8 trips per day
		Say 6 trips per hour

Based on the existing development's percentage of light and heavy vehicles, the expected additional trip generation of the proposal will be:

Additional Trips

Per Day:	24 light vehicle trips
	20 heavy vehicle trips
Total	44 vehicle trips
AM peak Hour:	5 light vehicle trips
	1 heavy vehicle trip
Total	6 vehicle trips

It is also expected that the additional PM peak hour volumes will be similar to the additional AM peak hour volumes.

Summary

The future traffic generation of the site is calculated as up to five additional light vehicle trips and one additional truck trip in each of the AM and PM peak hours. This equates, on average, to an additional car trip every 12 minutes and a truck trip every 60 minutes.

This additional traffic volume is assessed as low traffic generation which can easily be absorbed on the surrounding road network.

5.3 Proposed Truck Routes

As detailed in Section 4.2 of this report, the currently approved principal truck routes between the site and Sydney to the north is via Holmes Road, Ben Lomond Road, Airds Road, Rose Payten Drive, Campbelltown Road and the M31 Motorway. These routes to and from the site are shown on **Figure 4**.

A new access ramp was constructed onto the M31 Motorway from Raby Road during 2011, providing the area around the Redox site with a good access point for traffic towards Sydney. At the same time, the intersection of Campbelltown Road with the M31 on/off ramps about 900 metres south of the Redox site was reconstructed. The intersection was altered from a signalised T junction to a left in, left out only for the northern leg of Campbelltown Road. One of the reasons for this was the right turn from Campbelltown Road onto the M31 on ramp was no longer required because of the new on ramp from Raby Road.

This access point was not in existence at the time of the 2003 Redox site approval, and it is opportune and appropriate to now review the approved truck routes to potentially use this new M31 access ramp.

The new truck routes that would use the new M31 on ramp are:

From site to north

Holmes Road, left onto Ben Lomond Road, left onto Campbelltown Road, right onto Raby Road, right onto M31 on ramp.

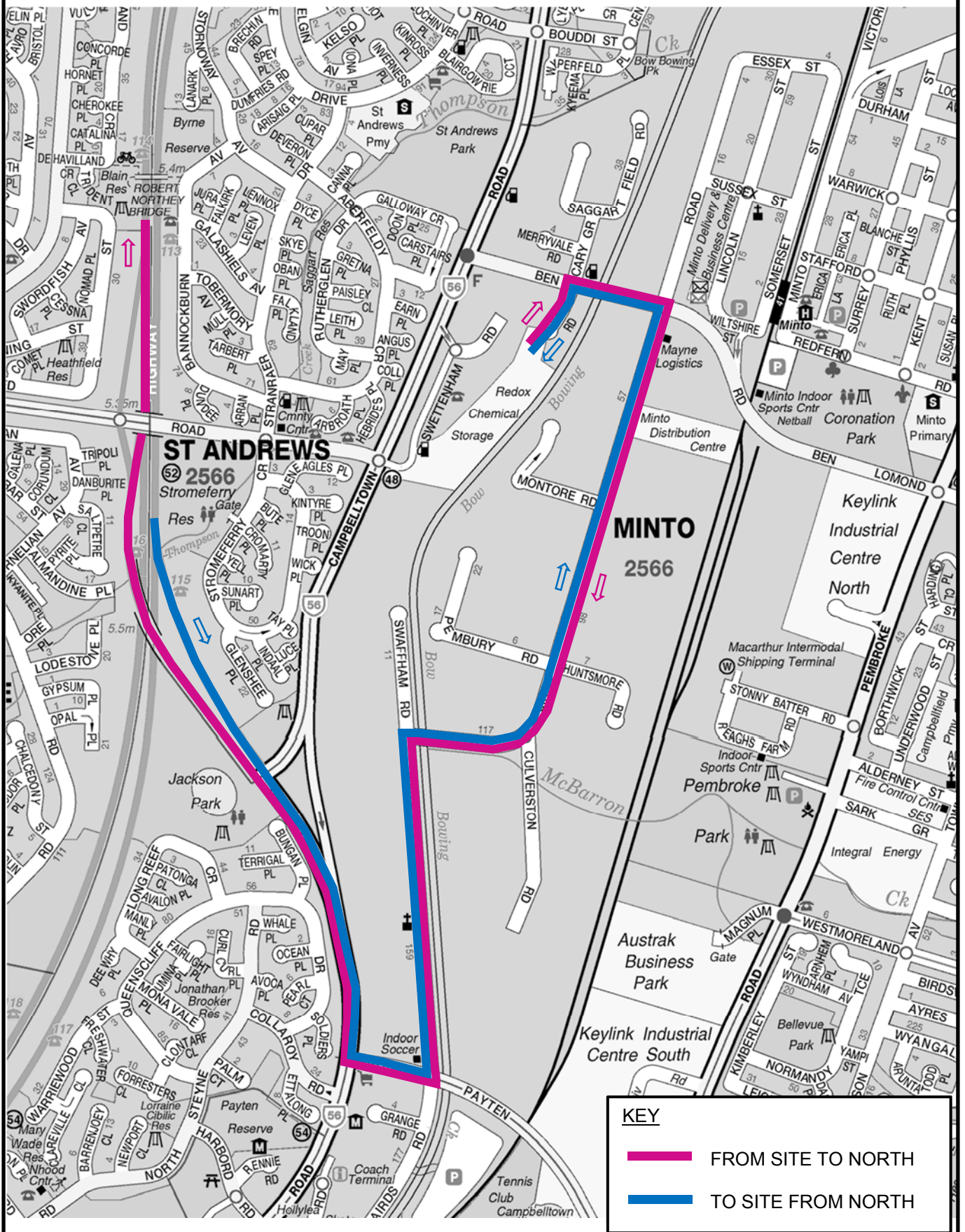
To site from north

M31 off ramp, left onto Campbelltown Road, right onto Ben Lomond Road, right onto Holmes Road.

These routes are shown on **Figure 5**.

5.3.1 Route Lengths

The proximity of the new M31 on ramp to the Redox site produces a considerable reduction in travel distance.



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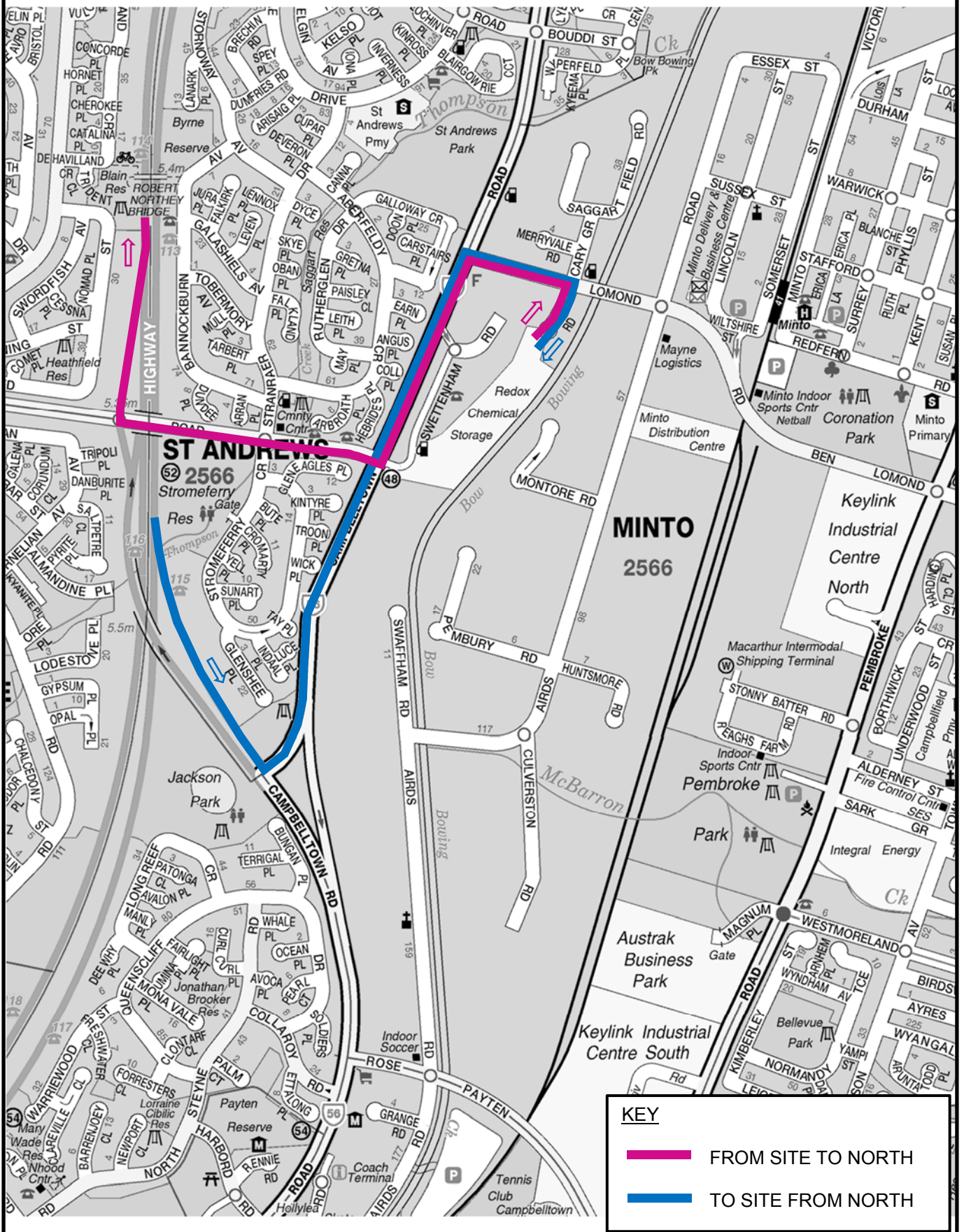


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FIGURE 4

REDOX PTY LTD,
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EXISTING TRUCK ROUTES

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FIGURE 5

REDOX PTY LTD,
 2 SWETTENHAM ROAD, MINTO

PROPOSED TRUCK ROUTES

JOB NO. 14228

From site to northern end of on ramp

Existing route	:	5.64km
Proposed route	:	2.25km
Reduced travel distance	:	3.39km

To site from northern end of off ramp

Existing route	:	4.67km
Proposed route	:	2.75km
Reduced travel distance	:	1.92km

For each truck movement the total reduced travel distance will be 5.31km.

With an average future daily volume of 76 truck movements, the daily saving in travel will be 403km, which will provide a substantial benefit to the local community in reduced traffic, noise and air pollution, and will also reduce and confine the area affected by truck movements to a shorter length of road.

5.3.2 Assessment of Proposed Northern Truck Route

To assess the suitability of the proposed truck routes, consideration will be given to the road classification, geometric suitability for trucks up to B-doubles, and traffic impact.

The existing truck route from the site involves use of 2.6km of local road, 0.5km of regional road and the remainder along State Roads/Motorway. The proposed truck route from the site will involve use of 0.1km of local road, 1.0km of regional road and the remainder along State Roads Motorway.

The existing truck route to the site involves use of 2.6km of local road, 0.5km of regional road and the remainder along State Roads/Motorway. The proposed truck route to the site will involve use of 0.1km of local road, 0.25km of regional road and the remainder along State Roads Motorway.

The above comparison of road classification shows the proposed truck routes will use significantly less local roads and will be on the classified road network for the entire journey, apart from the 0.1km length of Holmes Road.

The geometric assessment of the proposed truck routes involved applying swept paths of a B double truck to the routes and intersections along it. It has been established that B doubles, and hence all trucks accessing the site, are able to travel the proposed truck routes satisfactorily.

5.3.3 Traffic Impact of New Northern Truck Route

On site observations of the existing and proposed truck routes during peak hours were undertaken. Generally traffic conditions were observed to be good, with low delays at all the roundabouts along the routes. Traffic signals at the intersections of Campbelltown Road with Ben Lomond Road and Rose Payten Drive operated satisfactorily with only low to moderate delays.

The implications of altering the truck routes are that trucks to and from the site will no longer use Airds Road and Rose Payten Drive, and will use Campbelltown Road and Raby Road between the site and the M31 Motorway. The volumes involved will be very low in terms of total volumes using these roads. Total two way truck trips post Stage 4 development will be:

AM Peak hour : 9 trips
PM Peak hour : 7 trips

The impact of these trips on road and intersection operation along Campbelltown Road and Raby Road will be negligible and will not create any change to current levels of service at intersections. Any small impact on traffic signal operation at Campbelltown Road/Ben Lomond Road will be offset by an equal improvement of signal operation at Campbelltown Road/Rose Payten Drive.

In conclusion, the proposed northern truck routes will provide considerable advantages in lower travel distances for trucks and lower impacts on local roads and nearby developments in terms of noise and air pollution, while having no negative impact on traffic conditions on the surrounding road network.

5.3.4 Proposed New Southern Truck Route

The current Transport Code of Conduct also specifies the truck route to and from the south. The route for inbound trucks is:

- M31 Motorway from south;
- Narellan Road exit and east for 1.6km;
- North east into Blaxland Road for 950m;
- East into Rose Payton Drive for 200m;
- North into Airds Road for 2.5km;
- West into Ben Lomond Road for 300m; and
- South into Holmes Road to the site.

Outbound trucks use the same route in the opposite direction.

The percentage of trucks using the subject site to or from the south is low, and is estimated at less than 1 truck per hour.

The proposed new truck route for this direction of travel is:

- M31 Motorway from south;
- Campbelltown Road exit (Ingleburn);
- South on Campbelltown Road for 3.1km;
- East into Ben Lomond Road for 250m; and
- South into Holmes Road to the site.

Outbound trucks would use the same route in the opposite direction, other than the M31 on ramp near Williamson Road.

Similarly to the new proposed truck route for northbound trucks, the proposed route to and from the south will significantly reduce the length of local roads being used by trucks to only 100 metres of Holmes Road. This route will be far more logical and efficient for network operation and will reduce local traffic impacts.

The very low number of trucks involved (less than 1 per hour) will not cause any traffic impact on the classified road network between the site and the M31 Motorway.

5.4 Proposed Internal Traffic Arrangements

The proposed Stage 4 infill development will complete the industrial building with the good existing one way clockwise traffic movement being maintained. Trucks will travel to the new building along the existing eastern roadway, which has a generous width for passing traffic and manoeuvring room for each section of the building. The departing trucks will continue around the southern and western sides of the building to the exit. This one way flow has considerable safety and efficiency benefit for all site users, including pedestrians.

Existing grades, widths and corners are all satisfactory. The internal arrangements are fully in accordance with AS2890.2-2002, Off Street Facilities for Commercial Vehicles.

As detailed in Section 3.4 of this report, the existing onsite parking has been provided in accordance with the 2003 Ministerial development consent. Current usage of the 197 existing car spaces in the industrial compound of the site is low, reflecting the low number of employees typically involved in a chemical warehouse and distribution facility.

The proposed Stage 4 development will involve only a small increase in onsite staff, not expected to exceed six additional staff. The site has a significant over supply of car parking and an increase in demand for six staff cars will easily be accommodated. There is no justification for the provision of any new car parking in this proposal.

6.0 CONCLUSION

This Traffic and Parking Impact Assessment report has been carried out for Stage 4 of the Redox Pty Ltd chemical logistics facility at 2 Swettenham Road, Minto.

The Redox site is a large chemical logistics facility originally approved as a State Significant Project in 2003 by the Minister for Infrastructure and Planning. The development was approved as a 4 stage project and Stages 1, 2 and 3 have been completed. This new application is for Stage 4, with a request to modify the consent conditions for changes to types of chemicals to be stored and decanted and to modify heavy vehicle access routes. The proposed changes to these routes are the result of new road developments in the area.

The proposal will not require any alteration to the existing internal traffic or parking arrangements, which are all well designed and adequate for their use. The internal arrangements and vehicle access driveway are fully in accordance with AS2890.1-2004 and AS2890.2-2002. Currently the industrial component of the site provides 197 car parking spaces, which is a significant over supply for the current and future demand. The driveway to the site on Holmes Road caters for entering and exiting trucks, including an internal gate set back 40 metres to allow up to two articulated vehicles to queue at the gate while remaining within the property.

The site has good access to the surrounding classified road network, however the 2003 approval included truck routes which are no longer the most appropriate routes.

During 2011, a new M31 Motorway access ramp was constructed from Raby Road. The truck routes should now be altered as detailed in Section 5.3 in order to significantly reduce the truck impacts on local roads, confine trucks to the classified road network which has the traffic and structural capacity to accommodate trucks and to reduce noise and air pollution in the surrounding area. (see **Figures 4 and 5**).

Analysis of the existing site's traffic generation and the size and nature of the Stage 4 infill proposal, shows the following additional traffic trips will be generated:

Total additional daily vehicle trips:

Light vehicles	:	24 trips per day (12 in, 12 out)
Heavy vehicles	:	20 trips per day (10 in, 10 out)

AM Peak Hour (8am – 9am)

Light vehicles	:	5 trips (5 in, nil out)
Heavy vehicles	:	1 trip (1 in)

PM Peak Hour (5pm - 6pm)

Light vehicles	:	5 trips (nil in, 5 out)
Heavy vehicles	:	1 trip (1 out)

The above peak hour trip generation of the Stage 4 proposal equates on average to an additional car trip every 12 minutes and an additional truck trip every 60 minutes. This additional traffic volume is assessed as low traffic generation which can easily be absorbed on the surrounding road network.

In summary, the proposed development will generate a low volume of additional traffic which can easily be accommodated on the surrounding road network. It is well located in an industrial area with good access to the classified road network. It is well designed internally for trucks and cars and will not require any new parking or traffic facilities. The truck routes for the site are recommended to be altered to use the recently completed Raby Road on ramp to the M31 Motorway, due to the substantial benefits that will accrue to both the operator and the local community in terms of reduced traffic, noise and air pollution impacts. The proposed truck routes are all on classified roads which have the traffic, geometric and structural capacity to accommodate the truck traffic from the Redox site.

Appendix A – Transport Routes and Vehicle/Driver Requirements

All vehicles with a configuration of 4.5 tonne Gross Vehicle Mass (GVM) or any vehicle carrying Dangerous Goods greater than “Small Quantities” as per the definition in section 1.10 of the *Commonwealth Road Transport Reform (Dangerous Goods) Regulations*; are required to use the following designated routes when transporting materials to and/or from Redox Pty Ltd. No. 4 Holmes Road, Minto NSW 2566.

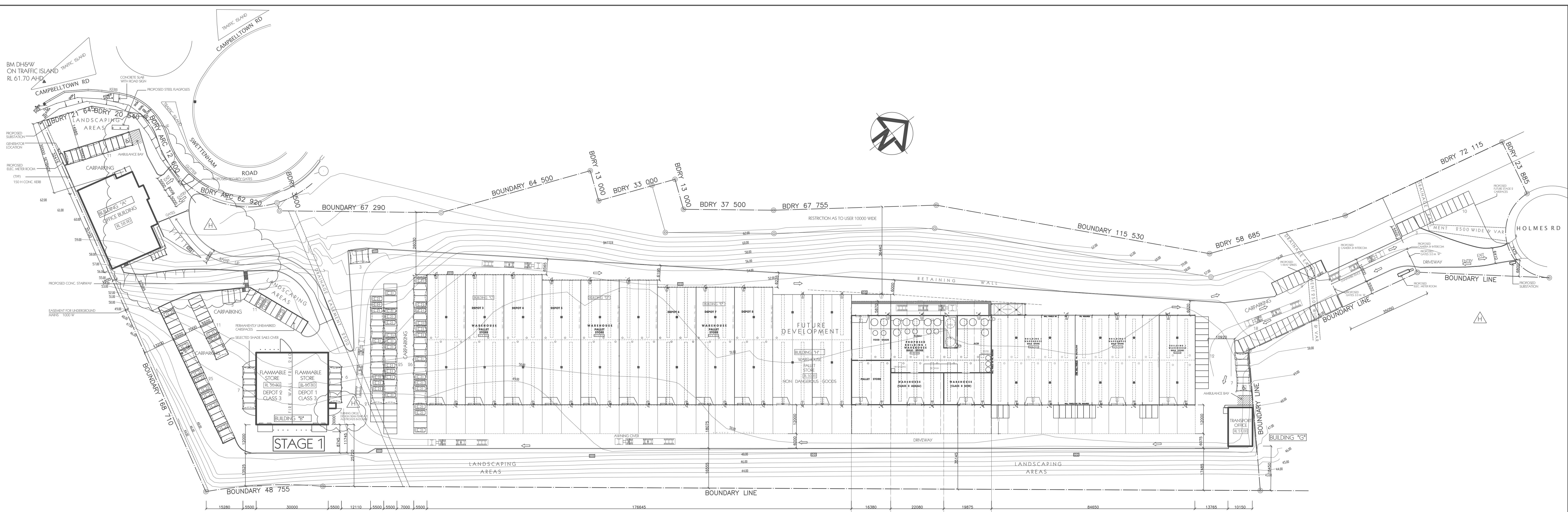
In addition, all heavy vehicles transporting materials to and/or from the site will:

- a. Have registration with an applicable Road Authority, and
- b. Have preventative and ongoing maintenance programs of the vehicles, and
- c. If transporting bulk Dangerous Goods, be licensed to transport these in the applicable jurisdictions of travel.

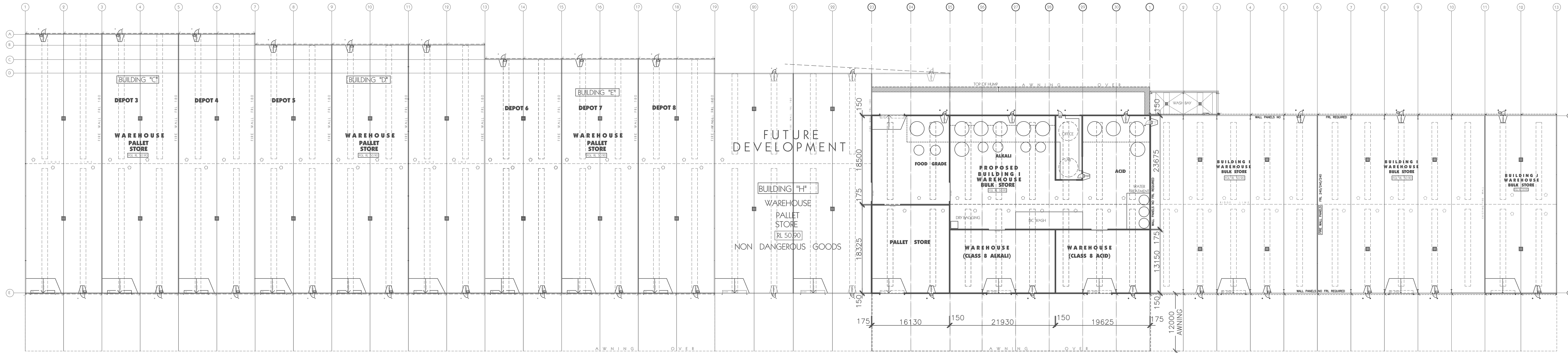
All heavy vehicle drivers transporting materials to and/or from the site will:

- d. Not use engine brakes on roads bordering residential areas, and
- e. Avoid the use of vehicle horns whilst on the site, and
- f. If transporting bulk Dangerous Goods, be licensed to transport these in the applicable jurisdictions of travel and will adhere to Dangerous Goods Legislation, and
- g. Access and depart the site in a forward direction via the Holmes Road entrance.

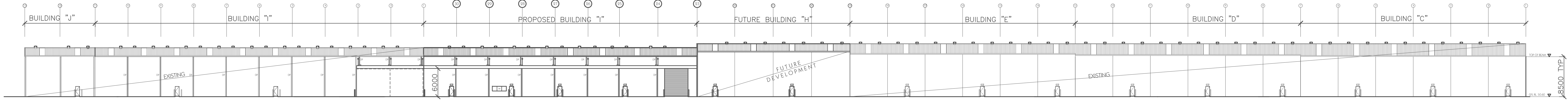
From the South	From the North
- Hume Highway (F5 Freeway); - Narellan Road exit and east for 1.6 km; - North east into Blaxland Road for 2.6 km; - North into Campbelltown Road for 950 m; - East into Rose Payten Drive for 200 m; - North into Airds Road for 2.5 km; - West into Ben Lomond Road for 300 m; and - South into Holmes Road to the site.	- Hume Highway (F5 Freeway); - Campbelltown Road exit south of Raby Road overpass and south for 1.4 km; - East into Rose Payten Drive for 200 m; - North into Airds Road for 2.5 km; - West into Ben Lomond Road for 300 m; and - South into Holmes Road to the Site.
Outbound vehicles would use the same route in the opposite direction.	Outbound vehicles would use the same route in the opposite direction.
Ingleburn Industrial Estate (Limited)	
Only vehicles that are delivering or picking up materials in the Ingleburn Industrial Estate after leaving the Redox site are permitted to use the following route. - Exit site into Holmes Road; - Turn west into Ben Lomond Road for 300 m; - Turn north into Campbelltown Road for 2.2 km; and - Turn into Williamson Road to the Ingleburn Industrial Estate. Southbound vehicles leaving would use the same route in the opposite direction, or alternately, if travelling north to the Sydney Metropolitan Region, would use the Brooks Road ramps to access the Hume Highway (F5 Freeway). Only rigid heavy vehicles carrying 12 pallets or less will be permitted to travel to the Ingleburn Industrial Estate.	
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OVERALL SITE PLAN
1:700



FLOOR PLAN 1:400



NORTH WEST ELEVATION 1:400

Dangerous Goods Stock Manifest

Stock Summary

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Class	Sub. Risks	Pack Group	Quantity Packaged		Quantity Bulk	
			Weight (kg)	Volume (L)	Weight (kg)	Volume (L)
3		II	3,137.476	3,891.047	1.000	1.075
3		III	17,668.162	28,944.471	26.227	27.350
3	6.1	II	1.484	1.873		
3	8	II	2,521.725	3,551.583		
4.1		II	0.700	2.557		
4.1		III	22.450	15.996		
4.2		II	0.270	0.298		
4.2		III	5.000	7.059		
4.3		III	0.400	0.175		
5.1		II	9.090	9.313		
5.1		III	41.750	55.244		
5.1	6.1	II	0.230	0.092		
5.1	6.1	III	97.400	152.680		
5.1	8	II	1.200	1.140		
5.1	8	III	0.800	0.640		
6.1		I	0.200	0.124		
6.1		II	0.010	0.010		
6.1		III	103,804.000	133,888.522		
6.1	8	II	0.300	0.240		
6.1		II	1.050	0.991		
6.1		III	0.450	0.360		
8		II	286,435.323	365,099.296	0.200	0.132
8		III	116,438.801	114,702.780		
8	3	I	0.500	0.499		
8	3	II	17.653	17.332		
8	6.1	II	251.000	300.876		
8	6.1	III	1,080.600	217.064		
8		II	8,710.050	9,939.989		

Dangerous Goods Stock Manifest

Stock Summary

		Location		Date	
		Redox Pty Ltd 4 Holmes Road Minto NSW 2566 Australia		2/11/2016	
				Emergency Contact 1	
				Emergency Contact 2	
8	III	26,978.700	35,302.577		
9	III	1,225.400	1,317.628		
Combustible Liquid (CL)		20,295.422	25,041.047	4.000	5.000

Dangerous Goods Stock Manifest

Stock by Building

Building B1 / ALGLET1500 to OILCEL1025

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ALGLET1500	Alkyl Glycidyl Ether Alkyl Glycidyl Ether	20160429: B14	1.44 tonne 8 x 180 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 68609-97-2 Xi, N	pH	Neutral
ALHYDR5600	Enersol L PETROLEUM DISTILLATES, N.O.S. (ALIPHATIC HYDROCARBON)	2980014: B14	0.8 KLTR 4 x 200 L drums	Class UN Number Poison Sch.	3 1268 5	Sub. Risk(s) Pack Group Hazchem	N/A II 3WE	Physical State CAS Number	Liquid 64742-89-8 F+, Xn, Xi, Carc. 2, Muta. 2	pH	N/A
BRFLUI4600	Brake Fluid Dot 4 (XHD 260) 220kg Drums BRAKE FLUID DOT4	2913148B: B14	0.88 tonne 4 x 220 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 143-22-6 Xi	pH	Alkali
CASODA1300	Caustic Soda Pearl SODIUM HYDROXIDE, SOLID	60301: B14	0.1 tonne 4 x 25 kg bags	Class UN Number Poison Sch.	8 1823 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2W	Physical State CAS Number	Solid 1310-73-2 C	pH	Conc. Str. Alkali
DIPENT1000	Dipentene DIPENTENE	452120215: B14	1.4 tonne 8 x 175 kg drums	Class UN Number Poison Sch.	3 2052 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III 3Y	Physical State CAS Number	Liquid 138-86-3 Xi, N	pH	N/A
DIQUPO2000	ABIL QUAT 3272 Diquaternary Polydimethylsiloxane	E516403685: B12	0.4 tonne 2 x 200 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 13473-05-6	pH	Alkali
DIQUPO2001	ABIL QUAT 3272 Diquaternary Polydimethylsiloxane	E516403672: B12	0.125 tonne 5 x 25 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 13473-05-6	pH	Alkali
DYBARB2700	AUTOMATE Red IK HF - 20kg Dye Automate Red IK HF	YY00FCS130: B11	220 kg 11 x 20 kg pails	Class UN Number Poison Sch.	CL N/A 5	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 71819-51-7 Xn	pH	Neutral
ETGLBE1502	Ethyl Glycol Monobutyl Ether ETHYL GLYCOL MONOBUTYL ETHER	3101695: B14	4.4 tonne 5 x 880 kg IBCs	Class UN Number Poison Sch.	CL N/A 6	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 111-76-2 Xn	pH	N/A
OILCEL1025	Celery Seed Oil "A" - 401/213 Celery seed Oil	3107642: B11	0.025 tonne 5 x 5 kg drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 8015-90-5 Xn	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building B1 / POLYIN4701 to SOLONE5500

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

	Description		Quantity								
Code	Proper Shipping Name	Batch(es) / Area(s)	Packs	Hazard Classification							
POLYIN4701	CHEMCURE 147	3000592771: B13	3049.6 kg	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	Corrosive Liquid, N.O.S. (Contains Diethylenetriamine & Tetraethylenepentamine)		16 x 190.6 kg drums	UN Number	1760	Pack Group	III	CAS Number			
PRGLME9800	Propyleneglycol Monomethyl Ether	3238369: B13	15.2 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	1-METHOXY-2-PROPANOL		80 x 190 kg drums	UN Number	3092	Pack Group	III	CAS Number	107-98-2		
PTFEAA0600	Dryfilm RA/IPA	3216915: B11	15.88 kg	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	ISOPROPANOL (ISOPROPYL ALCOHOL)		1 x 15.88 kg pails	UN Number	1219	Pack Group	II	CAS Number	Various		
SOLAET3220	SLES 70% 2EO(N) Low Dioxane	3198246B: B12	0.48 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		2 x 240 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
SOLONE5500	Shellsol A	2529619: B11	0.2 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	PETROLEUM DISTILLATES, N.O.S.(PETROLEUM NAPHTHA)		1 x 200 L drums	UN Number	1268	Pack Group	III	CAS Number	64742-95-6		
				Poison Sch.	5	Hazchem	3Y		Xn, N		

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / ACACID9800 to CYNONE6800

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

	Description		Quantity								
Code	Proper Shipping Name	Batch(es) / Area(s)	Packs	Hazard Classification							
ACACID9800	Acetic Acid 90% 20 Litre	C02000: CABINET SHELF (Sample)	0.0108 KLTR	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
	ACETIC ACID SOLUTION, more than 80% acid, by mass		0.54 x 20 L drums	UN Number	2789	Pack Group	II	CAS Number	64-19-7		
ACETON0200	Acetone	122341A: CABINET-F4 (Sample)	0.0005 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	ACETONE		0.003125 x 160 kg drums	UN Number	1090	Pack Group	II	CAS Number	67-64-1		
ALHYDR3200	Redsol D30	67949: CABINET-F2 (Sample)	0.00045 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	HYDROCARBON, LIQUID N.O.S (ISONANES AND N-NONANE)		0.002195 x 205 L drums	UN Number	3295	Pack Group	III	CAS Number	64742-48-9		
ALHYDR5200	X55 Solvent (Unmarked)	S13786: CABINET-F2 (Sample)	0.0005 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	PETROLEUM DISTILLATES, N.O.S. (Solvent Naphtha)		0.0025 x 200 L drums	UN Number	1268	Pack Group	II	CAS Number	64742-89-8		
ALHYDR7100	White Spirits	1913021: CABINET C1 (Sample)	0.0005 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	TURPENTINE SUBSTITUTE		0.0025 x 200 L drums	UN Number	1300	Pack Group	III	CAS Number	64742-82-1		
ALHYDR8600	White Spirits 205Ltr Drums	S13536: CABINET-F3 (Sample)	0.0002 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	PETROLEUM DISTILLATES, N.O.S.(CONTAINS WHITE SPIRITS)		0.000975 x 205 L drums	UN Number	1268	Pack Group	II	CAS Number	64742-89-8		
ALHYDR9800	White Spirit (Unmarked)	77563: CABINET-F2 (Sample)	0.0012 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	TURPENTINE SUBSTITUTE		1.2 x 1 L bulk	UN Number	1300	Pack Group	III	CAS Number	64742-82-1		
BUACEI1000	Butyl Acetate Industrial	56136: CABINET-F4 (Sample)	0.00078 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	BUTYL ACETATES		0.004333 x 180 kg drums	UN Number	1123	Pack Group	III	CAS Number	123-86-4		
BUACET1000	Butyl Acetate Urethane Grade	31909: CABINET-F4 (Sample)	0.002 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	BUTYL ACETATES		0.011111 x 180 kg drums	UN Number	1123	Pack Group	III	CAS Number	123-86-4		
BUTANO3001	Butanol Normal	102121: CABINET-F2 (Sample)	0.0003 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	BUTANOLS		0.001796 x 167 kg drums	UN Number	1120	Pack Group	III	CAS Number	71-36-3		
CYNONE6800	Cyclohexanone	86451: CABINET-F1 (Sample)	0.001 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	CYCLOHEXANONE		0.005263 x 190 kg drums	UN Number	1915	Pack Group	III	CAS Number	108-94-1		

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / DEHYAM3001 to DRICOB1500

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
DEHYAM3001	N,N-Diethylhydroxylamine DEHA FLAMMABLE LIQUID, N.O.S. (N,N-DIETHYLHYDROXYLAMINE)	S14856: CABINET-F3 (Sample)	0.0005 tonne 0.002941 x 170 kg drums	Class UN Number Poison Sch.	3 1993 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •3Y	Physical State CAS Number	Liquid 3710-84-7 Xn	pH	Alkali
DEHYAM5000	Diethylhydroxylamine 85% FLAMMABLE LIQUID, N.O.S. (N,N-DIETHYLHYDROXYLAMINE)	L148851: B21	0.185 tonne 1 x 185 kg drums	Class UN Number Poison Sch.	3 1993 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •3Y	Physical State CAS Number	Liquid 3710-84-7 Xn	pH	Alkali
DEMISP4000	SPIRDANE D 40S PETROLEUM DISTILLATES, N.O.S.(Naphtha (Petroleum), Hydrotreated Heavy)	84763: CABINET-F3 (Sample) 84765: CABINET-F1 (Sample)	0.0167 KLTR 16.7 x 1 L bulk	Class UN Number Poison Sch.	3 1268 5	Sub. Risk(s) Pack Group Hazchem	N/A III 3Y	Physical State CAS Number	Liquid 64742-48-9 Xn	pH	N/A
DEMISP6500	SPIRDANE D60 Spirdane D-60	20100640: CABINET-C8 (Sample) 84764: CABINET-C10 (Sample) S15068: CABINET-C10 (Sample)	0.00429 KLTR 0.02145 x 200 L drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 64742-48-9 Xn	pH	N/A
DIACAL1700	Diacetone Alcohol DIACETONE ALCOHOL	70449: CABINET-F3 (Sample)	0.00002 tonne 0.000102 x 195 kg drums	Class UN Number Poison Sch.	3 1148 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III •2Y	Physical State CAS Number	Liquid 123-42-2 Xi	pH	N/A
DIETHY1000	Diethylamine DIETHYLAMINE	2704070: B24 3189493: B23	2.52 tonne 18 x 140 kg drums	Class UN Number Poison Sch.	3 1154 Not schedule d	Sub. Risk(s) Pack Group Hazchem	8 II •2WE	Physical State CAS Number	Liquid 109-89-7 F, C	pH	Alkali
DIGLDI1000	Diethyleneglycol Dim. Ether FLAMMABLE LIQUID N.O.S (DIETHYLENEGLYCOL DIMETHYL ETHER)	S13295: CABINET-F3 (Sample)	0.0006 tonne 0.003076 x 195 kg drums	Class UN Number Poison Sch.	3 1993 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •3Y	Physical State CAS Number	Liquid 111-96-6 Xn, Xi	pH	N/A
DIPGME6500	Dipropyleneglycol Methyl Ether Dipropylene Glycol Monomethyl Ether	107293A: CABINET-C3 (Sample)	0.0003 tonne 0.001578 x 190 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 34590-94-8	pH	N/A
DIQUPO2000	ABIL QUAT 3272 Diquaternary Polydimethylsiloxane	E516303516: B22	0.2 tonne 1 x 200 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 13473-05-6	pH	Alkali
DRICOB1500	Drier - Cobalt Octoate 6% DRIER - COBALT OCTOATE 6%	S12577: CABINET-F4 (Sample)	0.00006 tonne 0.000333 x 180 kg drums	Class UN Number Poison Sch.	CL N/A 5	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid Various N, Xn	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / DYBAGM1000 to ISOPAR4200

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
DYBAGM1000	AUTOMATE GREEN HFX 20kg Pail	YY00G85270: B22	40 kg	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	AUTOMATE GREEN HFX LIQUID DYE		2 x 20 kg pails	UN Number	N/A	Pack Group	N/A	CAS Number	64742-94-5		
DYBARB2050	AUTOMATE RED IK HF 4 x 5kg Carton	YY00E7L073: B21	5 each	Poison Sch.	N/A	Hazchem	N/A		Xn, N		
	Dye Automate Red IK HF		5 x 1 each cartons	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	Neutral
DYBARB2700	AUTOMATE Red IK HF - 20kg	YY00F3K253: B22 YY00FCS130: B22	140 kg	UN Number	N/A	Pack Group	N/A	CAS Number	71819-51-7		
	Dye Automate Red IK HF		7 x 20 kg pails	Poison Sch.	5	Hazchem	N/A		Xn		
EPRESA1100	Epoxy Resin KER 1001-X-75	74539: CABINET-F1 (Sample)	0.001 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	RESIN SOLUTION		0.005 x 200 kg drums	UN Number	1866	Pack Group	III	CAS Number	25036-25-3		
ETALCO1500	95% SG Ethanol Bonded	S13333: CABINET-F2 (Sample)	0.0002 KLTR	Poison Sch.	N/A	Hazchem	•3Y		Xn		
	ETHANOL (ETHYL ALCOHOL) or ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)		0.001 x 200 L drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
ETALCO3000	Ethanol 95 (Bonded)	74163: CABINET-F4 (Sample) 87994: CABINET (Sample)	0.0005 KLTR	UN Number	1170	Pack Group	II	CAS Number	64-17-5		
	ETHANOL (ETHYL ALCOHOL) or ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)		0.0025 x 200 L drums	Poison Sch.	Not scheduled	Hazchem	•2YE		F		
ETETPR3000	Ethyl 3-Ethoxypropionate	136840: CABINET-F3 (Sample)	0.002 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	ESTERS, N.O.S. (ethyl 3-ethoxypropionate)		0.010526 x 190 kg drums	UN Number	3272	Pack Group	III	CAS Number	763-69-9		
ETETPR4000	Ethyl 3-Ethoxypropionate	EEP/201110P16: CABINET C1 (Sample)	0.00075 tonne	Poison Sch.	N/A	Hazchem	•3Y		Xn		
	ESTERS, N.O.S. (ethyl 3-ethoxypropionate)		0.00375 x 200 kg drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
ETGLBE6935	Ethylene Glycol Monobutyl Ether	3229145B: B24	0.54 tonne	UN Number	3272	Pack Group	III	CAS Number	763-69-9		
	ETHYL GLYCOL MONOBUTYL ETHER		3 x 180 kg drums	Poison Sch.	N/A	Hazchem	•3Y		Xn		
ETHYLP1000	N-Ethylpyrrolidone-2	S14778: CABINET-C7 (Sample)	0.0005 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	Alkali
	N-ETHYLPYRROLIDONE-2		0.0025 x 200 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	2687-91-4		
ISOPAR3200	SK Isol-G	C11421: CABINET-F1 (Sample)	0.0002 tonne	Poison Sch.	N/A	Hazchem	N/A		Xi		
	PETROLEUM DISTILLATES, N.O.S. (Naphtha (Petroleum) Hydrotreated Heavy)		0.001351 x 148 kg drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
ISOPAR4200	Isopar H	117272B: CABINET-F1 (Sample)	0.0002 KLTR	UN Number	1268	Pack Group	III	CAS Number	64742-48-9		
	HYDROCARBONS, LIQUID, N.O.S (Naphtha (petroleum), hydrotreated heavy)		0.00098 x 204 L drums	Poison Sch.	5	Hazchem	3Y		Xn, Carc. 2, Muta. 2		
				Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
				UN Number	3295	Pack Group	III	CAS Number	64742-48-9		
				Poison Sch.	5	Hazchem	3Y		Xn, F		

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / ISOPAR5000 to MESPSP2000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity	Hazard Classification							
	Proper Shipping Name		Packs								
ISOPAR5000	Isopar L	L134053: CABINET-C6 (Sample)	0.0005 KLTR	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	ISOPAR L		0.0025 x 200 L drums	UN Number	N/A	Pack Group	N/A	CAS Number	64742-48-9		
ISPRAC1000	Iso Propyl Acetate	61655: CABINET-F1 (Sample)	0.00035 tonne	Poison Sch.	5	Hazchem	N/A	CAS Number	Xn		
	ISOPROPYL ACETATE		0.001944 x 180 kg drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
KEROSE5000	Kerosene - High Flash	S13598: CABINET-SHELF (Sample)	0.005 KLTR	UN Number	1220	Pack Group	II	CAS Number	108-21-4		
	KEROSENE HIGH FLASH POINT		5 x 1 L bulk	Poison Sch.	N/A	Hazchem	•3YE	CAS Number	F+		
KEROSE8100	Kerosene	83903: CABINET-F3 (Sample)	0.0005 KLTR	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	KEROSENE		0.0025 x 200 L drums	UN Number	N/A	Pack Group	N/A	CAS Number	64741-44-2		
LIMONE3094	D-Limonene	3062688: B23	0.692 tonne	Poison Sch.	5	Hazchem	N/A	CAS Number	Xn, N		
	TERPENE HYDROCARBONS, N.O.S. (D-LIMONENE)		4 x 173 kg drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
MEACET2000	Methyl Acetate (Meac) 99.5%	007197: CABINET-F3 (Sample)	0.003 tonne	UN Number	2319	Pack Group	III	CAS Number	8028-48-6		
	METHYL ACETATE		0.015789 x 190 kg drums	Poison Sch.	Not scheduled	Hazchem	3Y	CAS Number	Xn, N		
MEISBU2000	Methyl Iso Butyl Ketone	77462: CABINET-F2 (Sample)	0.00045 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	METHYL ISOBUTYL KETONE		0.002727 x 165 kg drums	UN Number	1245	Pack Group	II	CAS Number	108-10-1		
MEISCA5000	Methyl Isobutyl Carbinol	091228: CABINET-F4 (Sample)	0.001 tonne	Poison Sch.	5	Hazchem	•3YE	CAS Number	F, Xn		
	METHYL ISOBUTYL CARBINOL		0.00625 x 160 kg drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
MEPRAC4000	Methoxypropyl Acetate	142866: CABINET F1 (Sample)	0.001 tonne	UN Number	2053	Pack Group	III	CAS Number	108-11-2		
	ESTERS, N.O.S. (2-METHOXY-1-METHYLETHYL ACETATE, 2-METHOXYPROPYL ACETATE)		0.005 x 200 kg drums	Poison Sch.	N/A	Hazchem	•3Y	CAS Number	Xi		
MEPYRR5100	Methyl-2-Pyrrolidone Min 99.9%	3082292: B24	4.2 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	N-Methyl-2-Pyrrolidone		20 x 210 kg drums	UN Number	3272	Pack Group	III	CAS Number	108-65-6		
MESPIR4000	Methylated Spirits 95%	C24956: CABINET-F1 (Sample)	0.0006 KLTR	Poison Sch.	Not scheduled	Hazchem	•3Y	CAS Number	Xi		
	ETHANOL (ETHYL ALCOHOL)		0.003 x 200 L drums	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	Alkali
MESPSP2000	100% SMS F4 Bonded	C12561: CABINET-F3 (Sample)	0.0004 KLTR	UN Number	N/A	Pack Group	N/A	CAS Number	872-50-4		
	ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)		0.002 x 200 L drums	Poison Sch.	6	Hazchem	N/A	CAS Number	T, Repr. 2		
				Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
				UN Number	1170	Pack Group	II	CAS Number	64-17-5		
				Poison Sch.	5	Hazchem	•2YE	CAS Number	F		
				Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
				UN Number	1170	Pack Group	II	CAS Number	64-17-5		
				Poison Sch.	Not scheduled	Hazchem	•2YE	CAS Number	F, Xi		

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / MESPSP4000 to SOLAET6800

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
MESPSP4000	95% SMS F6 Bonded ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	C17217: CABINET-F1 (Sample)	0.0006 KLTR 0.003 x 200 L drums	Class UN Number Poison Sch.	3 1170 5	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid 64-17-5 F	pH	N/A
METHAN3000	Methanol METHANOL	C03093: CABINET-F (Sample), CABINET-F3 (Sample) SAMPLE: CABINET (Sample)	0.001284 tonne 0.008025 x 160 kg drums	Class UN Number Poison Sch.	3 1230 6	Sub. Risk(s) Pack Group Hazchem	6.1 II •2WE	Physical State CAS Number	Liquid 67-56-1 F, T	pH	N/A
NOPARA0500	Normal Paraffin C5-C6 FLAMMABLE LIQUID, N.O.S (N-PARAFFIN)	S12644: CABINET-C12 (Sample)	0.001 KLTR 0.005 x 200 L drums	Class UN Number Poison Sch.	3 1993 5	Sub. Risk(s) Pack Group Hazchem	N/A II •3YE	Physical State CAS Number	Liquid 8002-74-2 F	pH	N/A
OILORA5500	Oil - Orange TERPENE HYDROCARBONS, N.O.S. (ORANGE OIL)	76627B: CABINET-F1 (Sample)	0.00025 tonne 0.001445 x 173 kg drums	Class UN Number Poison Sch.	3 2319 5	Sub. Risk(s) Pack Group Hazchem	N/A III 3Y	Physical State CAS Number	Liquid 8028-48-6 Xi, N	pH	N/A
OLEBPP1100	Black Pepper Oil - 401/667 Oleoresins - Black Pepper	401F165945: B21	0.01 tonne 1 x 10 kg drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 84929-41-9 Xi	pH	N/A
OLECEL1000	Oleoresin Celery 8% - 401/199 Oleoresin - Celery	401H150544: B21	0.1 tonne 5 x 20 kg drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 89997-35-3 Xi	pH	N/A
PRACET2100	Propyl Acetate NPAC n-PROPYL ACETATE	85319: CABINET-F3 (Sample)	0.0002 tonne 0.001111 x 180 kg drums	Class UN Number Poison Sch.	3 1276 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid 109-60-4 F, Xi	pH	N/A
PRGLME1000	Propyleneglycol Monometh Ether 1-METHOXY-2-PROPANOL	104311: CABINET-F3 (Sample)	0.0006 tonne 0.003243 x 185 kg drums	Class UN Number Poison Sch.	3 3092 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •2Y	Physical State CAS Number	Liquid 107-98-2	pH	N/A
PRGLME7000	Propyleneglycol Monometh Ether 1-METHOXY-2-PROPANOL	77586: CABINET-F2 (Sample)	0.0002 tonne 0.001086 x 184 kg drums	Class UN Number Poison Sch.	3 3092 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •2Y	Physical State CAS Number	Liquid 107-98-2	pH	N/A
PRGLME8000	Propyleneglycol Monometh Ether 1-METHOXY-2-PROPANOL	91730: CABINET-F2 (Sample) 98418: CABINET-F3 (Sample)	0.0003 tonne 0.001578 x 190 kg drums	Class UN Number Poison Sch.	3 3092 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •2Y	Physical State CAS Number	Liquid 107-98-2	pH	N/A
SILSUR7000	Matestab AK-8818 SILICONE SURFACTANT AK-8818	S14550: CABINET-C7 (Sample)	0.00025 tonne 0.00125 x 200 kg drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 68938-54-5	pH	Acid
SOLAET6800	SLES 70% 2EO Natural 170kg drums Sodium Lauryl Ether Sulphate	3187036C: B21	6.8 tonne 40 x 170 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Solid 68891-38-3 Xi, N	pH	Alkali

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / SOLONE7500 to VIPYVE1200

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
SOLONE7500	Solvarex 9S (100)	82173: CABINET-F1 (Sample)	0.008591 tonne	Class 3	Sub. Risk(s) N/A	Physical State	Liquid	pH	N/A		
	PETROLEUM DISTILLATES, N.O.S. (Solvent naphtha (petroleum) light aromatic)		8.591 x 1 kg bulk	UN Number 1268 Poison Sch. 5	Pack Group III Hazchem 3Y	CAS Number	64742-95-6	Xn, N			
SOLVEN3050	Solvent 2026 200L Drums	3195172: B24	0.4 KLTR	Class 3	Sub. Risk(s) N/A	Physical State		pH	N/A		
	PETROLEUM DISTILLATES, N.O.S.		2 x 200 L drums	UN Number 1268 Poison Sch. 6	Pack Group II Hazchem 3YE	CAS Number	Mixture F+, Xn, N				
TEACET2500	Terpinyl Acetate 95%	S14901: CABINET-C2 (Sample)	0.00005 tonne	Class CL	Sub. Risk(s)	Physical State	Liquid	pH	N/A		
	TERPINYL ACETATE		0.00027 x 185 kg drums	UN Number N/A Poison Sch. N/A	Pack Group N/A Hazchem N/A	CAS Number	80-26-2				
TOLUEN5500	Toluene	84419: CABINET-F2 (Sample)	0.001 KLTR	Class 3	Sub. Risk(s) N/A	Physical State	Liquid	pH	N/A		
	TOLUENE		0.005 x 200 L drums	UN Number 1294 Poison Sch. 6	Pack Group II Hazchem 3YE	CAS Number	108-88-3	F, Xn, Repr. 3			
VIPYVE1200	PVP VA73E - 180kg Drums	82057: CABINET-F1 (Sample)	0.0002 tonne	Class 3	Sub. Risk(s) N/A	Physical State	Liquid	pH	N/A		
	RESIN SOLUTION, flammable		0.001111 x 180 kg drums	UN Number 1866 Poison Sch. N/A	Pack Group II Hazchem •3YE	CAS Number	Mixture F				

Dangerous Goods Stock Manifest

Stock by Building

Building C1 / CECHLO6110 to LUBEAD3250

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Description		Batch(es) / Area(s)	Quantity		Hazard Classification						
Code	Proper Shipping Name		Packs								
CECHLO6110	Cetrimonium Chloride 28-30%	3155245: C12	4.439 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (cetrimonium chloride)		23 x 193 kg drums	UN Number	3267	Pack Group	II	CAS Number			
				Poison Sch.	Not schedule d	Hazchem	2X		Xn, N		
LUBEAD3250	VISCOPLEX 0-030 175kg Drum	1408271180: C11	1.225 tonne	Class	9	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	ELEVATED TEMPERATURE LIQUID, N.O.S. (contains MINERAL OIL)		7 x 175 kg drums	UN Number	3257	Pack Group	III	CAS Number			
				Poison Sch.	Not schedule d	Hazchem	2Y				

Dangerous Goods Stock Manifest

Stock by Building

Building C3 / BESOTH2600 to ISDIAM6000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
BESOTH2600	PROXEL GXL CAUSTIC ALKALI LIQUID, N.O.S.(SODIUM HYDROXIDE AND BENZISOTHIAZOLIN-3-ONE)	3808670: C31	0.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			1 x 200 kg drums	UN Number	1719	Pack Group	II	CAS Number	2634-33-5		
CAPOTA1200	Caustic Potash Flk POTASSIUM HYDROXIDE, SOLID	16.05.18: C34	1.1 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
			44 x 25 kg bags	UN Number	1813	Pack Group	II	CAS Number	1310-58-3		
CAPOTA1300	Caustic Potash Flk 500kg POTASSIUM HYDROXIDE, SOLID	15.02.01: C34 (Reject)	2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
			4 x 500 kg bags	UN Number	1813	Pack Group	II	CAS Number	1310-58-3		
CAPOTA1900	Caustic Potash Flake 25kg POTASSIUM HYDROXIDE, SOLID	20160804: C34	8.575 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
			343 x 25 kg bags	UN Number	1813	Pack Group	II	CAS Number	1310-58-3		
CASODA1100	Caustic Soda Pearl SODIUM HYDROXIDE, SOLID	00416: C36	21 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			840 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA5000	Caustic Soda Micropearl SODIUM HYDROXIDE, SOLID	3186420A: C34 3209630A: C34 3222866A: C34	96.675 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			3867 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA8200	Caustic Soda Micropearls SODIUM HYDROXIDE, SOLID	3223733A: C34	16.85 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			674 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
DICHLO1500	Dichlorophene - Liquid CORROSIVE LIQUID, N.O.S. (Contains Sodium Hydroxide)	DCN-L/F/1602001: C31	1.575 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
			7 x 225 kg drums	UN Number	1760	Pack Group	II	CAS Number	97-23-4		
EDTATL7800	EDTA Tetrasodium Salt 40% Liq CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (contains Tetrasodium EDTA)	3161343B: C31 3194329D: C31 3220535C: C32	12 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			12 x 1000 kg IBCs	UN Number	3267	Pack Group	III	CAS Number	64-02-8		
ISDIAM6000	Isophorone Diamine ISOPHORONEDIAMINE	3203230: C33	0.9 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
			5 x 180 kg drums	UN Number	2289	Pack Group	III	CAS Number	2855-13-2		

Dangerous Goods Stock Manifest

Stock by Building

Building C3 / LIHYDR2215 to SOMESI3200

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
LIHYDR2215	Lithium Hydroxide Monohydrate LITHIUM HYDROXIDE	3224932: C31	0.25 tonne 10 x 25 kg bags	Class UN Number Poison Sch.	8 2680 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 1310-66-3 C	pH	Conc. Str. Alkali
MEXYDI5000	Meta Xylene Diamine 200kg Drum AMINES, LIQUID, CORROSIVE, N.O.S. (m-XYLENEDIAMINE, 99%)	3110747A: C31	0.8 tonne 4 x 200 kg drums	Class UN Number Poison Sch.	8 2735 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 1477-55-0 C, Xn	pH	Alkali
NONPHE3001	Nonyl Phenol ALKYLPHENOLS, LIQUID, N.O.S. (including C2-C12 homologues)	3196877: C34	9.12 tonne 48 x 190 kg drums	Class UN Number Poison Sch.	8 3145 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 84852-15-3 C, N	pH	Alkali
SOHYDR1150	Sodium Hydrosulphide 900kg SODIUM HYDROSULPHIDE, HYDRATED, with not less than 25% water of crystallization	2727301: C34 (Reject)	1.8 tonne 2 x 900 kg bulkers	Class UN Number Poison Sch.	8 2949 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 16721-80-5 C	pH	Conc. Str. Alkali
SOHYDR2000	Sodium Hydrosulphide Flake SODIUM HYDROSULPHIDE, HYDRATED, with not less than 25% water of crystallization	3136242: C33 3216352A: C34	32.125 tonne 1285 x 25 kg bags	Class UN Number Poison Sch.	8 2949 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 16721-80-5 C	pH	Conc. Str. Alkali
SOMESE3200	Sodium Metasilicate Penta 25kg DISODIUM TRIOXOSILICATE	3214149: C36	40.55 tonne 1622 x 25 kg bags	Class UN Number Poison Sch.	8 3253 5	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 10213-79-3 C	pH	Conc. Str. Alkali
SOMESE4200	Sodium Metasilicate Penta DISODIUM TRIOXOSILICATE	3074315: C34	0.825 tonne 33 x 25 kg bags	Class UN Number Poison Sch.	8 3253 5	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 10213-79-3 C	pH	Conc. Str. Alkali
SOMESE6100	Sodium Metasilicate Penta Fine DISODIUM TRIOXOSILICATE	3208331: C33	19.575 tonne 783 x 25 kg bags	Class UN Number Poison Sch.	8 3253 5	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 10213-79-3 C	pH	Conc. Str. Alkali
SOMESI3200	Sodium Metasilicate Anhydrous DISODIUM TRIOXOSILICATE	3150378: C35	15.9 tonne 636 x 25 kg bags	Class UN Number Poison Sch.	8 3253 5	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 6834-92-0 C	pH	Conc. Str. Alkali

Dangerous Goods Stock Manifest

Stock by Building

Building C3 / SOSULF2900 to TRETTE4000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
SOSULF2900	Sodium Sulfide 10ppm SODIUM SULPHIDE, HYDRATED with not less than 30% water	2693859B: C31 (Reject)	0.05 tonne 2 x 25 kg bags	Class UN Number Poison Sch.	8 1849 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 27610-45-3 C, N, T	pH	Conc. Str. Alkali
SOSULF3000	Sodium Sulphide 30ppm SODIUM SULPHIDE, HYDRATED with not less than 30% water	3092289: C36	8 tonne 320 x 25 kg bags	Class UN Number Poison Sch.	8 1849 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 27610-45-3 C, N, T	pH	Conc. Str. Alkali
SUFBIO1002	REWOCID WK 30 CORROSIVE LIQUID, N.O.S. (microbicidal amphoteric surfactants)	3097051: C35	0.41 tonne 2 x 205 kg drums	Class UN Number Poison Sch.	8 1760 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid Various C, N	pH	Alkali
TDMAMP2000	Tri(Dimethylaminomethyl)Phenol AMINES, LIQUID, CORROSIVE N.O.S.(TRIS-2,4,6-(DIMETHYLAMINOMETHYL)PHENOL)	3083482: C31 3183930: C31	5.2 tonne 26 x 200 kg drums	Class UN Number Poison Sch.	8 2735 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 3X	Physical State CAS Number	Liquid 90-72-2 Xn, Xi	pH	Alkali
TDMAMP2001	Tri(Dimethylaminomethyl)Phenol AMINES, LIQUID, CORROSIVE N.O.S.(TRIS-2,4,6-(DIMETHYLAMINOMETHYL)PHENOL)	3094088: C36	11.2 tonne 56 x 200 kg drums	Class UN Number Poison Sch.	8 2735 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 3X	Physical State CAS Number	Liquid 90-72-2 Xn, Xi	pH	Alkali
TOLYLJ2500	Tolyltriazole Liq. 50% IBC CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (Tolytriazole, Sodium Salt)	3190556: C33 3201443: C34	3.6 tonne 3 x 1200 kg IBCs	Class UN Number Poison Sch.	8 3267 N/A	Sub. Risk(s) Pack Group Hazchem	CL III 2X	Physical State CAS Number	Liquid 64665-57-2 C, Xn	pH	Alkali
TRETTE4000	Triethylene Tetramine TRIETHYLENETETRAMINE	3091771: C34	16 tonne 80 x 200 kg drums	Class UN Number Poison Sch.	8 2259 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 112-24-3 C, N	pH	Conc. Str. Alkali

Dangerous Goods Stock Manifest

Stock by Building

Building D1 / ACACID1921 to HYACID1900

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACACID1921	Acetic Acid 75% ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass	SSBP140108: D12 (Reject)	0.21 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			1 x 210 kg drums	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
ACTEPO2210	Terpolymer XF-3100 CORROSIVE LIQUID, ACIDIC, ORGANIC N.O.S. (Acrylic Acid/2-Acrylamido-2-methylpropanesulfonic Acid Terpolymer)	3246566: D14	0.48 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 240 kg drums	UN Number	3265	Pack Group	II	CAS Number	Xi, C		
AMBIFL1100	Ammonium Bifluoride 98% Min AMMONIUM HYDROGENDIFLUORIDE, SOLID	3180504: D13	3.025 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
			121 x 25 kg bags	UN Number	1727	Pack Group	II	CAS Number	1341-49-7		
FORMAL1810	Formalin 37/7 (APVMA) 20L Carboys FORMALDEHYDE SOLUTION with not less than 25% formaldehyde	3801923: D13	1.68 KLTR	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
			84 x 20 L carboys	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
FORMAL1816	Formalin 37/7 (APVMA) 200L Drums FORMALDEHYDE SOLUTION with not less than 25% formaldehyde	60815AF42: D11 60921AF41: D14	2.2 KLTR	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
			11 x 200 L drums	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
FORMAL8500	Formaldehyde 37/7 (Industrial) 22kg Carboys FORMALDEHYDE SOLUTION with not less than 25% formaldehyde	60921AF41: D14	2.508 tonne	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
			114 x 22 kg carboys	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
FORMAL8600	Formaldehyde 37/7 Industrial (Seajay) 22kg Carboys FORMALDEHYDE SOLUTION with not less than 25% formaldehyde	3808183: D12	3.52 tonne	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
			160 x 22 kg carboys	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
GLACID1010	Glycolic Acid 70% Solution CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Glycolic Acid)	3137906: D12	13.5 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			54 x 250 kg drums	UN Number	3265	Pack Group	II	CAS Number	79-14-1		
HYACID1834	HYDROCHLORIC ACID 33%, 20 litre carboys (One-Way) HYDROCHLORIC ACID	3189417: D13	0.2 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			10 x 20 L carboys	UN Number	1789	Pack Group	II	CAS Number	7647-01-0		
HYACID1900	Hydrochloric Acid 33%, 240 kg Drums HYDROCHLORIC ACID	3133034: D11 3153317: D13	18.24 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			76 x 240 kg drums	UN Number	1789	Pack Group	II	CAS Number	7647-01-0		

Dangerous Goods Stock Manifest

Stock by Building

Building D1 / HYPACI2210 to POPEOX9900

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
HYPACI2210	Hypophosphorous Acid 50% Solution CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Hypophosphorous Acid)	2890966E: D14	0.3 tonne 12 x 25 kg carboys	Class UN Number Poison Sch.	8 3264 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 6303-21-5 C	pH	Acid
IODINE1020	Iodine Prill IODINE	3180437: D14	1 tonne 50 x 20 kg drums	Class UN Number Poison Sch.	8 3495 6	Sub. Risk(s) Pack Group Hazchem	6.1 III 2X	Physical State CAS Number	Solid 7553-56-2 Xn, N	pH	Acid
KUAMCO1450	Benzalkonium Chloride 50% Corrosive liquid, Acidic, Organic, N.O.S. (Benzalkonium Chloride, solution, 50%) (Benzalkonium Chloride)	3191520A: D13	6.8 tonne 34 x 200 kg drums	Class UN Number Poison Sch.	8 3265 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 139-07-1 C, N	pH	Acid
LAACID1700	L(+) Lactic Acid 80% FCC - 250kg CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	L1606020519: D14	0.75 tonne 3 x 250 kg drums	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 50-21-5 C	pH	Conc. Str. Acid
LAACID7800	Lactic Acid 80% 25kg Carboys CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	C15039: D11	0.025 tonne 1 x 25 kg carboys	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 50-21-5 C	pH	Conc. Str. Acid
LAACID9600	Lactic Acid Heatstable FCC 88% CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	L1603010297: D11	0.1 tonne 4 x 25 kg carboys	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 50-21-5 C	pH	Conc. Str. Acid
LUBEAD3210	STURACO 7098 208L Drum CORROSIVE LIQUID, N.O.S. (N-TALLOW-1,3- DIAMINOPROPANE, BIS(2-ETHYLHEXYL) HYDROGEN PHOSPHATE)	201511200071: D13	0.832 KLTR 4 x 208 L drums	Class UN Number Poison Sch.	8 1760 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid Mixture	pH	N/A
MAMEAC2500	XF-322W Maleic Acid Copolymer – drums CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Copolymer Of Maleic Anhydride And Acrylic Acid)	2962396C: D14	1 tonne 4 x 250 kg drums	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 113221-69-5 C	pH	Acid
PHACID0200	Phosphoric Acid 85% Food 330kg PHOSPHORIC ACID, SOLUTION	45CX1602016: D14 (Reject)	0.66 tonne 2 x 330 kg drums	Class UN Number Poison Sch.	8 1805 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2R	Physical State CAS Number	Liquid 7664-38-2 C	pH	Conc. Str. Acid
POPEOX9900	Pot Peroxymono Sulphate CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (Potassium Peroxomonosulfate)	3113427A: D11 3214043: D11	15.75 tonne 630 x 25 kg bags	Class UN Number Poison Sch.	8 3260 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 70693-62-8 C	pH	Acid

Dangerous Goods Stock Manifest

Stock by Building

Building D1 / SOBIFL2000 to ZICHLO1850

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
SOBIFL2000	Sodium Bifluoride	81776: D12	0.06 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	SODIUM HYDROGEN-DIFLUORIDE		3 x 20 kg bags	UN Number Poison Sch.	2439 Not schedule d	Pack Group Hazchem	II 2X	CAS Number	1333-83-1 T, C		
SOLAET6800	SLES 70% 2EO Natural 170kg drums	3132105: D12	0.17 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		1 x 170 kg drums	UN Number Poison Sch.	N/A Not schedule d	Pack Group Hazchem	N/A N/A	CAS Number	68891-38-3 Xi, N		
SUACID2000	Sulphamic Acid	2258552: D11 (Reject), D12 (Reject)	0.085 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	SULPHAMIC ACID		3.4 x 25 kg bags	UN Number Poison Sch.	2967 6	Pack Group Hazchem	III 2X	CAS Number	5329-14-6 Xi		
SUACID2050	Sulphamic Acid	3119994: D13	1.075 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	SULPHAMIC ACID		43 x 25 kg bags	UN Number Poison Sch.	2967 6	Pack Group Hazchem	III 2X	CAS Number	5329-14-6 Xi		
SUACID3500	Sulphamic Acid	3107528: D13	3.7 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	SULPHAMIC ACID		148 x 25 kg bags	UN Number Poison Sch.	2967 6	Pack Group Hazchem	III 2X	CAS Number	5329-14-6 Xi		
SUACID3700	Sulphamic Acid	3227297: D13	0.25 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	SULPHAMIC ACID		10 x 25 kg bags	UN Number Poison Sch.	2967 6	Pack Group Hazchem	III 2X	CAS Number	5329-14-6 Xi		
SUACID9000	Sulphamic Acid - 25kg	3222872: D13	19.8 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	SULPHAMIC ACID		792 x 25 kg bags	UN Number Poison Sch.	2967 6	Pack Group Hazchem	III 2X	CAS Number	5329-14-6 Xi		
ZICHLO1100	Zinc Chloride 98%	3158176: D14	0.95 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Acid
	ZINC CHLORIDE, ANHYDROUS		38 x 25 kg bags	UN Number Poison Sch.	2331 6	Pack Group Hazchem	III 2X	CAS Number	7646-85-7 C, N, Xn		
ZICHLO1850	Zinc Chloride	2932527A: D12	0.05 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Acid
	ZINC CHLORIDE, ANHYDROUS		2 x 25 kg bags	UN Number Poison Sch.	2331 6	Pack Group Hazchem	III 2X	CAS Number	7646-85-7 C, N, Xn		

Dangerous Goods Stock Manifest

Stock by Building

Building D2 / BAMETA2500 to SOSILI1500

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
BAMETA2500	Barium Metaborate BARIUM COMPOUND, N.O.S. (Barium metaborate monohydrate)	3085573: D22	1 tonne 40 x 25 kg bags	Class UN Number Poison Sch.	6.1 1564 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2Z	Physical State CAS Number	Solid 13701-59-2 Xn	pH	Alkali
CAFFEI6200	Caffeine Anhydrous BP/USP ALKALOIDS, SOLID, N.O.S. (Caffeine)	1031601837: D24	0.68 tonne 34 x 20 kg cartons	Class UN Number Poison Sch.	6.1 1544 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 58-08-2 T	pH	N/A
CHMEIS3000	Cmit Min 14% - 250Kg Drums CORROSIVE LIQUID, TOXIC, N.O.S. (5-Chloro-2-methyl-4-isothiazolin-3-one)	3028126B: D23	0.25 tonne 1 x 250 kg drums	Class UN Number Poison Sch.	8 2922 6	Sub. Risk(s) Pack Group Hazchem	6.1 II 2X	Physical State CAS Number	Liquid 26172-55-4 C, N	pH	Acid
DBTOXI1000	Di-N-Butyltinoxide ORGANOTIN COMPOUND, SOLID, N.O.S. (Contains Dibutyltin Oxide)	2844090B: D21 (Reject)	0.05 tonne 2 x 25 kg drums	Class UN Number Poison Sch.	6.1 3146 7	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 818-08-6 T, N, Xi, Muta. 2	pH	N/A
IODINE1020	Iodine Prill IODINE	3013963: D24	0.08 tonne 4 x 20 kg drums	Class UN Number Poison Sch.	8 3495 6	Sub. Risk(s) Pack Group Hazchem	6.1 III 2X	Physical State CAS Number	Solid 7553-56-2 Xn, N	pH	Acid
SOSILI1000	Sodium Silicofluoride SODIUM FLUOROSILICATE	3141851: D24 (Reject)	0.02 tonne 0.8 x 25 kg bags	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1000	Sodium Silicofluoride SODIUM FLUOROSILICATE	3199408: D21 3214387: D22	31 tonne 1240 x 25 kg bags	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1029	Sodium Silicofluoride SODIUM FLUOROSILICATE	3078719: D24 (Reject)	1.8 tonne 72 x 25 kg bags	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1029	Sodium Silicofluoride SODIUM FLUOROSILICATE	3233900: D21	4 tonne 160 x 25 kg bags	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1100	Sodium Silicofluoride SODIUM FLUOROSILICATE	2762159C: D21 (Reject) 2847852: D21 (Reject)	1.902 tonne 1.902 x 1000 kg bulkers	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1100	Sodium Silicofluoride SODIUM FLUOROSILICATE	3141850C: D24	59 tonne 59 x 1000 kg bulkers	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1500	Sodium Silicofluoride SODIUM FLUOROSILICATE	53892A: D22 (Reject)	0.4 tonne 16 x 25 kg bags	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building D2 / THIOUR7501 to TRCHLO1020

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
THIOUR7501	Thiourea Min 99%	L80710: D24	0.025 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	TOXIC SOLID, ORGANIC, N.O.S. (Thiourea)		1 x 25 kg bags	UN Number	2811	Pack Group	III	CAS Number	62-56-6		
TRCHLO1020	Trichloroethylene Superior Grade	3093938: D23	3.92 tonne	Poison Sch.	6	Hazchem	2X		Xn, N		
	TRICHLOROETHYLENE	3155563: D22	14 x 280 kg drums	Class	6.1	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
				UN Number	1710	Pack Group	III	CAS Number	79-01-6		
				Poison Sch.	6	Hazchem	2Z		T, Xi, N, Carc. 2, Muta. 3		

Dangerous Goods Stock Manifest

Stock by Building

Building Default / HEPTAN3080 to LAACID9600

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
HEPTAN3080	Heptane Bulk	3229045: Default	0.01 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	HEPTANES		10 x 1 L bulk	UN Number	1206	Pack Group	II	CAS Number	64742-49-0		
LAACID1700	L(+) Lactic Acid 80% FCC - 250kg	L1606130841: Default	3.75 tonne	Poison Sch.	5	Hazchem	3YE		F, Xn, N		
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)		15 x 250 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
LAACID2800	L(+) Lactic Acid 88% - 1200kg	L1606130842: Default	1.2 tonne	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)		1 x 1200 kg IBCs	Poison Sch.	N/A	Hazchem	2X		C		
LAACID4700	Lactic Acid Heatstable FCC 88%	L1606130840: Default	1.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)		1 x 1200 kg IBCs	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
LAACID9600	Lactic Acid Heatstable FCC 88%	L1606130840: Default	0.05 tonne	Poison Sch.	N/A	Hazchem	2X		C		
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)		2 x 25 kg carboys	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
				UN Number	3265	Pack Group	II	CAS Number	50-21-5		
				Poison Sch.	N/A	Hazchem	2X		C		

Dangerous Goods Stock Manifest

Stock by Building

Building E2 / CASODA1800 to CASODA1800

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

	Description		Quantity								
Code	Proper Shipping Name	Batch(es) / Area(s)	Packs		Hazard Classification						
CASODA1800	Caustic Soda Pearl	140641B: E22 (Reject)	0.175 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str.
	SODIUM HYDROXIDE, SOLID		7 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		Alkali
				Poison Sch.	6	Hazchem	2W		C		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / ACACID2700 to ACRACI9000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACACID2700	Acetic Acid 75% IBCs ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass	Sample: 8LA1 (Sample)	0.0008 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.0008 x 1000 kg IBCs	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
ACACID6200	Acetic Acid 45% - 200kg ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass	C03286: 8LA3 (Sample)	0.001 tonne	Poison Sch.	5	Hazchem	2R	C			
			0.005 x 200 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
ACACID6400	Acetic Acid 45% 1000kg IBC ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass	1999345: LAB (Sample)	0.000001 tonne	UN Number	2790	Pack Group	III	CAS Number	64-19-7		
			0.000001 x 1000 kg IBCs	Poison Sch.	5	Hazchem	2R	C			
ACACID6800	Acetic Acid 99.85% Pails ACETIC ACID, GLACIAL	1887262: 4S1 (Sample) 1998750: LAB (Sample) 2514598: LAB (Sample)	0.002113 KLTR	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
			0.140866 x 15 L pails	UN Number	2789	Pack Group	II	CAS Number	64-19-7		
ACACID7400	Acetic Acid 75% 1000kg IBC (One-way) ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass	C14797: 8LA3 (Sample)	0.0006 tonne	Poison Sch.	6	Hazchem	•2P	C			
			0.0006 x 1000 kg IBCs	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
ACACID8000	Acetic Acid 90% 200kg Drum ACETIC ACID SOLUTION, more than 80% acid, by mass	73030: QPBOX (Sample) 73035: QPBOX (Sample)	0.0002 tonne	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
			0.001 x 200 kg drums	Poison Sch.	6	Hazchem	•2P	C, C			
ACACID9800	Acetic Acid 90% 20 Litre ACETIC ACID SOLUTION, more than 80% acid, by mass	2370216: LAB (Sample)	0.000001 KLTR	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
			0.00005 x 20 L drums	UN Number	2789	Pack Group	II	CAS Number	64-19-7		
ACCARB0601	Picaclean SR CORROSIVE SOLID, BASIC, ORGANIC, N.O.S. (Contains Potassium Hydroxide)	S13892: NS33 (Sample)	0.00045 tonne	Poison Sch.	6	Hazchem	•2P	C, C			
			0.018 x 25 kg bags	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
ACCOPO7000	Acrylic Copolymer XF-3211 CORROSIVE LIQUID, N.O.S. (Acrylic Acid/2-acrylamido-2-methylpropanesulfonic Acid Copolymer)	3211100314: 8LB1 (Sample) 3211110722: NL04 (Sample)	0.0015 tonne	UN Number	3263	Pack Group	II	CAS Number	7440-44-0		
			0.00125 x 1200 kg IBCs	Poison Sch.	N/A	Hazchem	2X	C			
ACRACI9000	Acrylic Acid 99.5% Min ACRYLIC ACID, STABILISED	20141210: NL09 (Sample)	0.0003 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	N/A
			0.0015 x 200 kg drums	UN Number	2218	Pack Group	II	CAS Number	79-10-7		
				Poison Sch.	Not schedule d	Hazchem	•2W	C, N			

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / ACTEPO4000 to BESOTH9900

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACTEPO4000	XF-5000 Acrylic and Maleic Polymers CORROSIVE LIQUID, ACIDIC, ORGANIC N.O.S. (Acrylic Acid/2-Acrylamido-2-methylpropanesulfonic Acid Terpolymer)	5000100919: NL02 (Sample)	0.0002 tonne 0.00016 x 1250 kg IBCs	Class UN Number Poison Sch.	8 3265 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid Xi, C	pH	Conc. Str. Acid
ACTEPO4100	Terpolymer XF-3100 CORROSIVE LIQUID, ACIDIC, ORGANIC N.O.S. (Acrylic Acid/2-Acrylamido-2-methylpropanesulfonic Acid Terpolymer)	3100110814: NL04 (Sample)	0.0001 tonne 0.000476 x 210 kg drums	Class UN Number Poison Sch.	8 3265 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid Xi, C	pH	Conc. Str. Acid
ALGLET1500	Alkyl Glycidyl Ether Alkyl Glycidyl Ether	20120605: LAB (Sample)	0.000111 tonne 0.000616 x 180 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 68609-97-2 Xi, N	pH	Neutral
ALHYDR2400	White Spirits (Low Aromatic) TURPENTINE SUBSTITUTE	2376960: LAB (Sample)	0.000056 KLTR 0.000271 x 206 L drums	Class UN Number Poison Sch.	3 1300 5	Sub. Risk(s) Pack Group Hazchem	N/A III 3Y	Physical State CAS Number	Liquid 64742-82-1 T, N, Carc. 2, Muta. 2	pH	N/A
ALPAST1600	ZQ-6122 Aluminium Paste 325 Mesh ALUMINIUM POWDER, COATED	2514034: 4S1 (Sample)	0.02 tonne 0.8 x 25 kg drums	Class UN Number Poison Sch.	4.1 1309 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 4Z	Physical State CAS Number	Solid 7429-90-5 F, T	pH	N/A
AMAQUE7200	Ammonia Aqueous 25% - 210kg AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia	121087: 8LA2 (Sample)	0.00025 tonne 0.00119 x 210 kg drums	Class UN Number Poison Sch.	8 2672 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2R	Physical State CAS Number	Liquid 1336-21-6 C, N	pH	Alkali
AMAQUI7000	Ammonia Aqueous 23% IBC AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia	149144B: QPBOX1 (Sample)	0.0002 tonne 0.000219 x 910 kg IBCs	Class UN Number Poison Sch.	8 2672 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2R	Physical State CAS Number	Liquid 1336-21-6 C, N	pH	Alkali
AMBIFL1300	Ammonium Bifluoride 98% Min AMMONIUM HYDROGENDIFLUORIDE, SOLID	1868839: NS02 (Sample)	0.0003 tonne 0.012 x 25 kg bags	Class UN Number Poison Sch.	8 1727 7	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 1341-49-7 T+, C	pH	Acid
BEHENT4000	VARISOFT BT 85 Pellets SOLIDS CONTAINING FLAMMABLE LIQUID N.O.S. (contains 2-Propanol)	ST02999707: NS60 (Sample)	0.0006 tonne 0.024 x 25 kg drums	Class UN Number Poison Sch.	4.1 3175 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 1Z	Physical State CAS Number	Solid Xn, N	pH	N/A
BESOTH9900	Benzisothiazolin-3-One CORROSIVE LIQUID, N.O.S. (1,2-BENZISOTHIAZOLINE-3-ONE)	S14325: 8LB2 (Sample)	0.0002 tonne 0.001 x 200 kg drums	Class UN Number Poison Sch.	8 1760 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 2634-33-5 Xi	pH	Acid

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / BIOCID0900 to CACYAN1200

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
BIOCID0900	Biocide Microcheck MZ 9F CORROSIVE LIQUID, TOXIC, N.O.S	S13919: 8LA2 (Sample)	0.0003 tonne 0.0015 x 200 kg drums	Class UN Number Poison Sch.	8 2922 N/A	Sub. Risk(s) Pack Group Hazchem	6.1 II 2XE	Physical State CAS Number	Liquid 55965-84-9 C	pH	Acid
BIOCID5700	Biocide Microcheck MZ 521 CORROSIVE LIQUID,ACIDIC,ORGANIC,N.O.S.(5-CHLORO-2-METHYL-4-ISOTHIASOL-3-ONE	S13494: 8LA3 (Sample)	0.0005 tonne 0.0004 x 1250 kg IBCs	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 55965-84-9	pH	Acid
BORONF3000	Amorphous Boron Powder FLAMMABLE SOLID, INORGANIC, N.O.S. (Boron powder)	1869301: LAB (Sample)	0.0001 tonne 0.006666 x 15 kg pails	Class UN Number Poison Sch.	4.1 3178 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 1Z	Physical State CAS Number	Solid 7440-42-8 Xn, F	pH	N/A
BRCHDI3000	BCDMH 20g Tablet OXIDIZING SOLID CORROSIVE N.O.S (Bromochloro-5,5-dimethylimidazolidine-2,4-dione)	101856: 5S1 (Sample)	0.0008 tonne 0.032 x 25 kg drums	Class UN Number Poison Sch.	5.1 3085 6	Sub. Risk(s) Pack Group Hazchem	8 III 1W	Physical State CAS Number	Solid 32718-18-6 C, O, N	pH	Acid
BRFLUI4600	Brake Fluid Dot 4 (XHD 260) 220kg Drums BRAKE FLUID DOT4	26/1/15: NL14 (Sample)	0.0008 tonne 0.003636 x 220 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	8 N/A N/A	Physical State CAS Number	Liquid 143-22-6 Xi	pH	Alkali
BRHYDR1000	2-bromo-4'-hydroxyacetophenone TOXIC SOLID, CORROSIVE, ORGANIC, N.O.S (2-Bromo-4'-hydroxyacetophenone)	20130520: NS48 (Sample)	0.0003 tonne 0.012 x 25 kg drums	Class UN Number Poison Sch.	6.1 2928 N/A	Sub. Risk(s) Pack Group Hazchem	8 II 2X	Physical State CAS Number	Solid 2491-38-5 T	pH	N/A
BUTYTR1000	Monobutyltintrichloride CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S (Monobutyltintrichloride)	133845: 8LA3 (Sample)	0.0001 tonne 0.002 x 50 kg drums	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 1118-46-3 C	pH	N/A
BUTYTR3000	Monobutyltintrichloride CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S (Monobutyltintrichloride)	134104: 8LA3 (Sample)	0.0002 tonne 0.004 x 50 kg drums	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 1118-46-3 C	pH	N/A
CAACID1100	Caprylic Acid CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (CAPRYLIC ACID)	3244148: NL02 (Sample)	0.0028 tonne 0.015555 x 180 kg drums	Class UN Number Poison Sch.	8 3265 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 124-07-2 C	pH	N/A
CACYAN1200	Calcium Cyanamide Granular 1200kg CALCIUM CYANAMIDE with more than 0.1% calcium carbide	023140819: NS11 (Sample)	0.0004 tonne 0.000333 x 1200 kg bulkers	Class UN Number Poison Sch.	4.3 1403 6	Sub. Risk(s) Pack Group Hazchem	N/A III 4W	Physical State CAS Number	Solid 156-62-7 Xn	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / CAHYPO8500 to CASODA1007

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CAHYPO8500	Calcium Hypochlorite 70% Gran	2305435: NS68 (Sample)	0.0036 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	CALCIUM HYPOCHLORITE, HYDRATED	77457: 5S2 (Sample)	0.08 x 45 kg drums	UN Number	2880	Pack Group	II	CAS Number	7778-54-3		
	MIXTURE with not less than 5.5% but not more than 16% water	92299: 5S1 (Sample)		Poison Sch.	6	Hazchem	1W		O, C, N		
CAHYPO8900	Calcium Hypochlorite 70% Gran	1908113: NS08 (Sample)	0.0001 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	CALCIUM HYPOCHLORITE, HYDRATED		0.0025 x 40 kg drums	UN Number	2880	Pack Group	II	CAS Number	7778-54-3		
	MIXTURE with not less than 5.5% but not more than 16% water			Poison Sch.	6	Hazchem	1W		O, C, N		
CAHYPO9400	Calcium Hypochlorite 70%	2148341: NS09 (Sample)	0.1 kg	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	CALCIUM HYPOCHLORITE, HYDRATED		0.01 x 10 kg pails	UN Number	2880	Pack Group	II	CAS Number	7778-54-3		
	MIXTURE with not less than 5.5% but not more than 16% water			Poison Sch.	6	Hazchem	1W		O, C, N		
CAHYPO9401	Calcium Hypochlorite 70% (Pool Ranger)	2148351: NS09 (Sample)	0.1 kg	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	CALCIUM HYPOCHLORITE, HYDRATED		0.01 x 10 kg pails	UN Number	2880	Pack Group	II	CAS Number	7778-54-3		
	MIXTURE with not less than 5.5% but not more than 16% water			Poison Sch.	6	Hazchem	1W		O, C, N		
CANITR2200	Calcium Nitrate Tetrahydrate 25kg	2363580: NS11 (Sample)	0.001 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	CALCIUM NITRATE		0.04 x 25 kg bags	UN Number	1454	Pack Group	III	CAS Number	13477-34-4		
				Poison Sch.	N/A	Hazchem	1Z				
CANITR4700	Calcium Nitrate Tetra 99%	105346: 5S2 (Sample)	0.0008 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	CALCIUM NITRATE	133606B: QPBOX2 (Sample)	0.032 x 25 kg bags	UN Number	1454	Pack Group	III	CAS Number	13477-34-4		
				Poison Sch.	N/A	Hazchem	1Z				
CAPOLI1000	Caustic Potash Liquid	SAMPLE: NL17 (Sample)	0.005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	POTASSIUM HYDROXIDE SOLUTION		0.017857 x 280 kg drums	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
				Poison Sch.	6	Hazchem	2R		C		
CAPOLI3000	Caustic Potash Liquid 1490kg	122756B: QPBOX (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	POTASSIUM HYDROXIDE SOLUTION		0.000134 x 1490 kg IBCs	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
				Poison Sch.	6	Hazchem	2R		C		
CAPOTA1900	Caustic Potash Flake 25kg	100222001: 8SA2 (Sample)	0.0017 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	POTASSIUM HYDROXIDE, SOLID		0.068 x 25 kg bags	UN Number	1813	Pack Group	II	CAS Number	1310-58-3		
				Poison Sch.	N/A	Hazchem	2W		C		
CAPOTA2500	Caustic Potash Pellets 25kg	110915: 8SB1 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	POTASSIUM HYDROXIDE, SOLID		0.02 x 25 kg cartons	UN Number	1813	Pack Group	II	CAS Number	1310-58-3		
				Poison Sch.	N/A	Hazchem	2W		C		
CASODA1007	Caustic Soda 99.0% Min Flake	S14273: 8SB1 (Sample)	0.00015 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE, SOLID		0.006 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2W		C		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / CASODA3500 to CECHLO6000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CASODA3500	Caustic Soda Pearl SODIUM HYDROXIDE, SOLID	71280: 8SB1 (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			0.008 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA3600	Caustic Soda Flake SODIUM HYDROXIDE, SOLID	71332: 8SB1 (Sample)	0.0004 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			0.016 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA5000	Caustic Soda Micropearl SODIUM HYDROXIDE, SOLID	2652127B: LAB (Sample)	0.025 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			1 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA6000	Caustic Soda Micropearl 25 kg Bags SODIUM HYDROXIDE, SOLID	82975: 8SB1 (Sample)	0.00025 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			0.01 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA7700	Caustic Soda Flake 99% SODIUM HYDROXIDE, SOLID	99962: 8SB1 (Sample)	0.0001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			0.004 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CAUSOB1000	Caustic Soda Liquid 50% Bulk SODIUM HYDROXIDE SOLUTION	L119511: 8LA3 (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.2 x 1 kg bulk	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD0100	Caustic Soda/Potassium Hydroxide Blend Returnable IBC Corrosive Liquid, Basic, Inorganic NOS (Sodium hydroxide, Potassium hydroxide)	081015: LAB (Sample)	0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.000675 x 1480 kg IBCs	UN Number	3266	Pack Group	II	CAS Number			
CAUSOI0900	Caustic Soda Liq 48.5% 1510kg SODIUM HYDROXIDE SOLUTION	2204599A: 8LA1 (Sample)	0.00025 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.000165 x 1510 kg IBCs	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOI3301	Caustic Soda Liq 32% IBC SODIUM HYDROXIDE SOLUTION	L112475: 8LB1 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.000378 x 1320 kg IBCs	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CECHLO6000	VARISOFT 300 CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (cetrimonium chloride)	JA22B28675: NS62 (Sample) Y114700291: NS70 (Sample)	0.0015 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
			0.008021 x 187 kg drums	UN Number	3267	Pack Group	II	CAS Number			
				Poison Sch.	Not scheduled	Hazchem	2X		Xn, N		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / CERAMS2000 to DOBENZ1801

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CERAMS2000	Ceramasil - Medium CERAMSIL	C18378: 8SB1 (Sample)	0.001 tonne 0.05 x 20 kg pails	Class UN Number Poison Sch.	8 3253 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid	pH	N/A
CHLORT1000	Chloramine T Trihydrate CORROSIVE SOLID, BASIC,ORGANIC, N.O.S. (Chloramine T trihydrate)	01231: NS33 (Sample)	0.0008 tonne 0.032 x 25 kg drums	Class UN Number Poison Sch.	8 3263 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid	pH	Alkali
DBTDLA1000	Dibutyltindilaurate ORGANOTIN COMPOUND, LIQUID, N.O.S. (Contains Dibutyltindilaurate)	15202613: NL10 (Sample) 15205010/1: 6L1 (Sample) 15205510: 6L1 (Sample) S14388: 6L1 (Sample)	0.00105 tonne 0.042 x 25 kg drums	Class UN Number Poison Sch.	6.1 2788 7	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid	pH	Neutral
DBTOX1000	Di-N-Butyltinoxide ORGANOTIN COMPOUND, SOLID, N.O.S. (Contains Dibutyltin Oxide)	06022310: 6S1 (Sample) S14388: 6S1 (Sample)	0.0001 tonne 0.004 x 25 kg drums	Class UN Number Poison Sch.	6.1 3146 7	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid	pH	N/A
DEMISP8301	Solvent YK-D80 Hydrocarbons, C11-C14, n-alkanes, isoalkanes, cyclics, <2% aromatics	1980395: NL06 (Sample)	0.0008 KLTR 0.004 x 200 L drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid	pH	N/A
DIBRNI4000	DBNPA TOXIC SOLID, ORGANIC, N.O.S. (2,2-Dibromo-3- Nitrilo-Propionamide)	55971F: 6S1 (Sample)	0.00045 tonne 0.018 x 25 kg drums	Class UN Number Poison Sch.	6.1 2811 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid	pH	Acid
DICECH1000	VARISOFT 432 CG FLAMMABLE LIQUID, CORROSIVE, N.O.S. (Isopropanol quaternary ammonium compounds)	JA01724896: NS61 (Sample)	0.001725 tonne 0.009745 x 177 kg drums	Class UN Number Poison Sch.	3 2924 N/A	Sub. Risk(s) Pack Group Hazchem	8 II •3WE	Physical State CAS Number	Liquid	pH	N/A
DIPENT2000	Dipentene 90% DIPENTENE	2111258: LAB (Sample)	0.000044 tonne 0.00022 x 200 kg drums	Class UN Number Poison Sch.	3 2052 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III 3Y	Physical State CAS Number	Liquid	pH	N/A
DIQUPO2000	ABIL QUAT 3272 Diquaternary Polydimethylsiloxane	E515602503: NS70 (Sample)	0.0005 tonne 0.0025 x 200 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid	pH	Alkali
DISOSU7100	REWOPOL SB DO 75 ETHANOL SOLUTION	S0105210150: NS71 (Sample) Y114800397: NS70 (Sample)	0.00045 tonne 0.00225 x 200 kg drums	Class UN Number Poison Sch.	3 1170 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •2Y	Physical State CAS Number	Liquid	pH	N/A
DOBENZ1801	LABS ACID 210kg drums ALKYLSULPHONIC ACIDS, LIQUID with not more than 5% free sulphuric acid	TK130813: 8LB2 (Sample)	0.0045 tonne 0.021428 x 210 kg drums	Class UN Number Poison Sch.	8 2586 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid	pH	Acid

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / DOBENZ6801 to ETGLMH0800

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
DOBENZ6801	L.A.B.S.A min 96% 1100kg IBC ALKYLSULPHONIC ACIDS, LIQUID with not more than 5% free sulphuric acid	J1A140210-8: 8LA1 (Sample)	0.0002 tonne 0.000181 x 1100 kg IBCs	Class UN Number Poison Sch.	8 2586 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 68584-22-5 C, N	pH	Acid
DOPYRR2000	N-Dodecyl-2-Pyrrolidone CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (N-DODECYL-2-PYRROLIDONE)	74892: 8LB1 (Sample)	0.0015 tonne 0.008333 x 180 kg drums	Class UN Number Poison Sch.	8 3267 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 2687-96-9 C, N	pH	Alkali
DRYAID1010	CARSPRAY 300 CARSPRAY300	J014300606: NL05 (Sample) J014902270: NL10 (Sample)	0.0013 tonne 0.007344 x 177 kg drums	Class UN Number Poison Sch.	3 1219 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2YE	Physical State CAS Number	Liquid Mixture F, Xi	pH	N/A
DTPAAC1000	DTPA.5Na CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (Diethylenetriaminepentaacetic acid pentasodium salt, Sodium hydroxide)	62710: 8LB1 (Sample) S13240: 8LB1 (Sample)	0.00155 tonne 0.0062 x 250 kg drums	Class UN Number Poison Sch.	8 3267 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid Various Xi	pH	Alkali
DTPAAC4000	DTPA 5Na 40% CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (Diethylenetriaminepentaacetic acid pentasodium salt, Sodium hydroxide)	1879924: 8LA1 (Sample)	0.0015 tonne 0.006 x 250 kg drums	Class UN Number Poison Sch.	8 3267 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid Various Xi	pH	Alkali
ETACET1100	Ethyl Acetate 99.5% Min ETHYL ACETATE	143344A: QPBOX1 (Sample)	0.0001 tonne 0.000555 x 180 kg drums	Class UN Number Poison Sch.	3 1173 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II •3YE	Physical State CAS Number	Liquid 141-78-6 F, Xi	pH	N/A
ETALCO3000	Ethanol 95 (Bonded) ETHANOL (ETHYL ALCOHOL) or ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	2719517: LAB (Sample) Sample: LAB (Sample)	1.892123 KLTR 9.460615 x 200 L drums	Class UN Number Poison Sch.	3 1170 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid 64-17-5 F	pH	N/A
ETETPR6000	Ethyl 3-Ethoxypropionate FLAMMABLE LIQUID, N.O.S. (Ethyl-3-Ethoxypropionate)	2651930: LAB (Sample) 2758396: LAB (Sample) SAMPLE: LAB (Sample)	0.001022 tonne 0.005241 x 195 kg drums	Class UN Number Poison Sch.	3 1993 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III •3Y	Physical State CAS Number	Liquid 763-69-9	pH	N/A
ETGLBE6938	Ethylene Glycol Monobutyl Ether ETHYL GLYCOL MONOBUTYL ETHER	3160867: LAB (Sample)	0.0002 tonne 0.001111 x 180 kg drums	Class UN Number Poison Sch.	CL N/A 6	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 111-76-2 Xn	pH	N/A
ETGLMH0800	Cellosolve Solvent 907kg IBC CORROSIVE LIQUID, TOXIC, N.O.S (ETHYLENE GLYCOL MONOHEXYL ETHER)	91222: 8LA2 (Sample)	0.4 kg 0.000441 x 907 kg IBCs	Class UN Number Poison Sch.	8 2922 N/A	Sub. Risk(s) Pack Group Hazchem	6.1 II 2XE	Physical State CAS Number	Liquid 112-25-4 C, Xn	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / ETSILI3000 to HEXANE4000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

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	Description			Quantity							
Code	Proper Shipping Name	Batch(es) / Area(s)		Packs		Hazard Classification					
ETSILJ3000	Ethyl Silicate	82991: QPBOX (Sample)	0.00025 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	TETRAETHYL SILICATE		0.00125 x 200 kg drums	UN Number	1292	Pack Group	III	CAS Number	11099-06-2		
				Poison Sch.	N/A	Hazchem	3Y		Xn		
FASOFT8001	VARISOFT SEA	Y114B00730: NL05 (Sample)	0.00045 tonne	Class	4.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	FLAMMABLE SOLID ORGANIC, N.O.S. (Isopropanol solution)		0.002368 x 190 kg drums	UN Number	1325	Pack Group	III	CAS Number			
				Poison Sch.	N/A	Hazchem	1Z		N		
FERCHL6000	Ferrous Chloride 31-33% Soln	75688: 8LA2 (Sample)	0.0006 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Ferrous Chloride Solution)		0.000428 x 1400 kg IBCs	UN Number	3264	Pack Group	II	CAS Number	7758-94-3		
				Poison Sch.	5	Hazchem	2X		C		
FERSUL9900	Ferric Sulphate Liquid IBC	L133328: 8LA3 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	CORROSIVE LIQUID N.O.S (FERRIC SULPHATE)		0.000316 x 1580 kg IBCs	UN Number	1760	Pack Group	II	CAS Number	10028-22-5		
				Poison Sch.	5	Hazchem	2X		C, Xi		
FORMIC3700	Formic Acid 85% 1200kg IBC	133952: QPBOX1 (Sample)	0.0036 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
	FORMIC ACID with more than 85% acid by mass		0.003 x 1200 kg IBCs	UN Number	1779	Pack Group	II	CAS Number	64-18-6		
				Poison Sch.	5	Hazchem	●2W		C		
GLACIC2510	Glycolic Acid 70% Cosmetic Grade	20151011: NL08 (Sample)	0.00025 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC N.O.S. (GLYPURE HUGH PURITY ACID)		0.001 x 250 kg drums	UN Number	3265	Pack Group	II	CAS Number	79-14-1		
				Poison Sch.	6	Hazchem	2X		C		
GLUTER6000	Glutaraldehyde 50% Industry Gr	13082306: 8LA1 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (GLUTARALDEHYDE 50%)		0.002272 x 220 kg drums	UN Number	3265	Pack Group	II	CAS Number	111-30-8		
				Poison Sch.	6	Hazchem	2X		T, N, C		
GLUTER7000	Glutaraldehyde 50% Ind.Grd IBC	13052003: LAB (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (GLUTARALDEHYDE 50%)	13061201: LAB (Sample)	0.000454 x 1100 kg IBCs	UN Number	3265	Pack Group	II	CAS Number	111-30-8		
				Poison Sch.	6	Hazchem	2X		T, N, C		
GUACAI5200	Cerospray G	601.955: NSF12 (Sample)	0.0004 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Acid
	Gum Acacia (Gum Arabic)		0.016 x 25 kg bags	UN Number	N/A	Pack Group	N/A	CAS Number	9000-01-5		
				Poison Sch.	Not schedule d	Hazchem	N/A				
HEGLYC0600	Hexylene Glycol	136673: QPBOX1 (Sample)	0.0022 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	Hexylene Glycol	154388: LAB (Sample)	0.011282 x 195 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	107-41-5		
				Poison Sch.	Not schedule d	Hazchem	N/A		Xi		
HEXANE4000	Hexane - Drums	2286185: LAB (Sample)	0.001962 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	HEXANES	2312327: LAB (Sample)	0.00981 x 200 L drums	UN Number	1208	Pack Group	II	CAS Number	64742-49-0		
				Poison Sch.	5	Hazchem	3YE		F, Xn, N		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / HYPERO6000 to LAACID2700

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
HYPERO6000	Hydrogen Peroxide 50% 25kg	C04764: QPBOX1 (Sample)	0.0002 tonne	Class	5.1	Sub. Risk(s)	8	Physical State	Liquid	pH	Conc. Str. Acid
	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)		0.008 x 25 kg carboys	UN Number	2014	Pack Group	II	CAS Number	7722-84-1		
HYSULP2500	Hydroxylamine Sulphate 99% Min	20100502: 8SA1 (Sample)	0.0009 tonne	Poison Sch.	6	Hazchem	2P	CAS Number	O, C		
	HYDROXYLAMINE SULPHATE		0.036 x 25 kg bags	UN Number	2865	Pack Group	III	CAS Number	10039-54-0	pH	Acid
IMIDAZ3000	Imidazole	S14229: 8SA2 (Sample)	0.001 tonne	Poison Sch.	Not schedule d	Hazchem	2X	CAS Number	E, N, Xn, Carc. 3		
	CORROSIVE SOLID, BASIC, ORGANIC N.O.S. (IMIDAZOLE)		0.04 x 25 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Neutral
IODINE1000	Iodine ACS - Prilled	107167A: 8SA1 (Sample)	0.0001 tonne	UN Number	3263	Pack Group	III	CAS Number	288-32-4		
	IODINE		0.004 x 25 kg cartons	Poison Sch.	N/A	Hazchem	2X	CAS Number	Xn, C	pH	Acid
IODINE1800	Iodine ACS - Prilled	150864A: 8SA1 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	6.1	Physical State	Solid	pH	Acid
	IODINE		0.01 x 50 kg drums	UN Number	3495	Pack Group	III	CAS Number	7553-56-2		
ISOPAR3901	SK-ISOL G	1926096: LAB (Sample)	0.000027 KLTR	Poison Sch.	6	Hazchem	2X	CAS Number	Xn, N		
	PETROLEUM DISTILLATES, N.O.S. (Naphtha (Petroleum) Hydrotreated Heavy)		0.000135 x 200 L drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
ISOPAR5006	Isopar L	2515251: NL08 (Sample)	0.0005 KLTR	UN Number	1268	Pack Group	III	CAS Number	64742-48-9		
	ISOPAR L		0.0025 x 200 L drums	Poison Sch.	5	Hazchem	3Y	CAS Number	Xn, Carc. 2, Muta. 2		
KEROSE5100	Shellsol 2046 - Drums	SAMPLE: LAB (Sample)	0.000113 KLTR	Class	CL	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	KEROSENE HIGH FLASH POINT		0.000565 x 200 L drums	UN Number	N/A	Pack Group	N/A	CAS Number	64742-81-0		
KUAMCO1450	Benzalkonium Chloride 50%	3008477: LAB (Sample)	0.00005 tonne	Poison Sch.	5	Hazchem	N/A	CAS Number	Xn		
	Corrosive liquid, Acidic, Organic, N.O.S. (Benzalkonium Chloride, solution, 50%) (Benzalkonium Chloride)		0.00025 x 200 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
LAACID2600	L(+) Lactic Acid 88% - 25kg	L091228916: 8LA3 (Sample)	0.0003 tonne	UN Number	3265	Pack Group	II	CAS Number	139-07-1		
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	L1104160468: QPBOX1 (Sample)	0.012 x 25 kg drums	Poison Sch.	6	Hazchem	2X	CAS Number	C, N		
LAACID2700	L(+) Lactic Acid 88% - 250kg	L1104160468: 8LA1 (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)		0.0008 x 250 kg drums	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
				Poison Sch.	N/A	Hazchem	2X	CAS Number	C		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / LAACID2900 to MALEAC1500

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
LAACID2900	L(+) Lactic Acid 88% - 25kg CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	CO2490: 8LA1 (Sample)	0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.04 x 25 kg carboys	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
LAACID4100	DI (-) Lactic Acid 88% CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	L090219103: 8LA2 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.000416 x 1200 kg IBCs	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
LAACID4600	Lactic Acid Heatstable FCC 88% CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	101510A: 8LA2 (Sample) S14775: 8LA1 (Sample)	0.00035 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.0014 x 250 kg drums	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
LAACID5101	Lactic Acid 88% 25kg CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	74148: 8LA1 (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.008 x 25 kg carboys	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
LIHYDR2200	Lithium Hydroxide Mono LITHIUM HYDROXIDE	127582: 8SA2 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			0.02 x 25 kg bags	UN Number	2680	Pack Group	II	CAS Number	1310-66-3		
LIMONE1830	d-Limonene TERPENE HYDROCARBONS, N.O.S. (D-LIMONENE)	12082006: NL01 (Sample)	0.00075 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
			0.004411 x 170 kg drums	UN Number	2319	Pack Group	III	CAS Number	8028-48-6		
LIMONE5800	Limonene-D TERPENE HYDROCARBONS, N.O.S. (D-LIMONENE)	IAAC001730: LAB (Sample)	0.000005 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
			0.000028 x 173 kg drums	UN Number	2319	Pack Group	III	CAS Number	8028-48-6		
MAANH4401	Maleic Anhydride Briquettes MALEIC ANHYDRIDE or MALEIC ANHYDRIDE, MOLTEN	95874A: 8SA1 (Sample)	0.0004 tonne	Class	8	Sub. Risk(s)	N/A	Physical State		pH	N/A
			0.016 x 25 kg bags	UN Number	2215	Pack Group	III	CAS Number	108-31-6		
MAANH6100	Maleic Anhydride - 25kg Bag MALEIC ANHYDRIDE or MALEIC ANHYDRIDE, MOLTEN	74142: 8SA2 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State		pH	N/A
			0.02 x 25 kg bags	UN Number	2215	Pack Group	III	CAS Number	108-31-6		
MALEAC1500	Maleic Acid Powder CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S (MALEIC ACID)	155243: LAB (Sample) PUAS011-T: 8SA1 (Sample)	0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Acid
			0.04 x 25 kg bags	UN Number	3261	Pack Group	III	CAS Number	110-16-7		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / MEACET2015 to NICHLO5501

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity	Hazard Classification							
	Proper Shipping Name		Packs	Class	UN Number	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Neutral
MEACET2015	Methyl Acetate Bulk METHYL ACETATE	2940870: NL08 (Sample)	0.001 tonne 1 x 1 kg bulk	Class UN Number Poison Sch.	3 1231 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid 79-20-9 F, Xi	pH	Neutral
MECHLO8100	Methylene Chloride 99.8% Min DICHLOROMETHANE	133202A: 6S1 (Sample)	0.0005 tonne 0.001851 x 270 kg drums	Class UN Number Poison Sch.	6.1 1593 5	Sub. Risk(s) Pack Group Hazchem	N/A III 2Z	Physical State CAS Number	Liquid 75-09-2 Xn, Carc. 3	pH	N/A
MEETHY5100	Methyl Ethyl Ketoxime (MEKO) METHYL ETHYL KETOXIME	067: NL14 (Sample)	0.00025 tonne 0.001315 x 190 kg drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 96-29-7 Xn	pH	N/A
MEPYRR1100	N-Methylpyrrolidone Dist. N-Methyl-2-Pyrrolidone	20160701106: NL10 (Sample)	0.001 tonne 0.004761 x 210 kg drums	Class UN Number Poison Sch.	CL N/A 6	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 872-50-4 T, Repr. 2	pH	Alkali
MESPSP2500	Methylated Spirits 100% F4 SMS ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	2829765: LAB (Sample)	0.0002 KLTR 0.001 x 200 L drums	Class UN Number Poison Sch.	3 1170 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid 64-17-5 F, Xi	pH	N/A
MESPSP7500	100 F3 SMS (Bonded) ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	SAMPLE: LAB (Sample)	0.756834 KLTR 3.78417 x 200 L drums	Class UN Number Poison Sch.	3 1170 5	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid F	pH	N/A
METHAN3000	Methanol METHANOL	C03093: QPBOX1 (Sample)	0.0001 tonne 0.000625 x 160 kg drums	Class UN Number Poison Sch.	3 1230 6	Sub. Risk(s) Pack Group Hazchem	6.1 II •2WE	Physical State CAS Number	Liquid 67-56-1 F, T	pH	N/A
METHAN3300	Methanol METHANOL	C27510: QPBOX (Sample)	0.0001 tonne 0.000625 x 160 kg drums	Class UN Number Poison Sch.	3 1230 6	Sub. Risk(s) Pack Group Hazchem	6.1 II •2WE	Physical State CAS Number	Liquid 67-56-1 F, T	pH	N/A
MEXYDI2000	Meta Xylene Diamine AMINES, LIQUID, CORROSIVE, N.O.S. (m-XYLENEDIAMINE, 99%)	96446: 8LB2 (Sample)	0.0002 tonne 0.001 x 200 kg drums	Class UN Number Poison Sch.	8 2735 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 1477-55-0 C, Xn	pH	Alkali
MORPHO4000	Morpholine MORPHOLINE	117710: 8LA2 (Sample)	0.0005 tonne 0.0025 x 200 kg drums	Class UN Number Poison Sch.	8 2054 N/A	Sub. Risk(s) Pack Group Hazchem	3 I •2W	Physical State CAS Number	Liquid 110-91-8 C	pH	Alkali
NICHLO5500	Nickel Chloride 25kg TOXIC SOLID, INORGANIC, N.O.S.(Nickelous Chloride, 6-Hydrate)	09100251: NS21 (Sample)	0.0005 tonne 0.02 x 25 kg bags	Class UN Number Poison Sch.	6.1 3288 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 7718-54-9 T	pH	Acid
NICHLO5501	Nickel Chloride 25kg TOXIC SOLID, INORGANIC, N.O.S.(Nickelous Chloride, 6-Hydrate)	09100251: NS27 (Sample)	0.0001 tonne 0.004 x 25 kg bags	Class UN Number Poison Sch.	6.1 3288 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 7718-54-9 T	pH	Acid

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / NICHLS1000 to PHOACI8010

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity	Hazard Classification							
	Proper Shipping Name		Packs								
NICHLS1000	Nickel Chloride 12% Solution	C01071: 6L2 (Sample)	0.0002 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	TOXIC LIQUID, INORGANIC, N.O.S.(Nickelous Chloride 12%)		0.000187 x 1065 kg IBCs	UN Number	3287	Pack Group	III	CAS Number	7791-20-0		
NISODA1000	Nitrate Of Soda	120302: 5S2 (Sample) 58020: 5S2 (Sample)	0.00045 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Neutral
	SODIUM NITRATE		0.018 x 25 kg bags	UN Number	1498	Pack Group	III	CAS Number	7631-99-4		
NISODA5300	Nitrate Of Soda Prilled	103027: 5S3 (Sample)	0.0019 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Neutral
	SODIUM NITRATE		0.0019 x 1000 kg bulkers	UN Number	1498	Pack Group	III	CAS Number	7631-99-4		
NISODA8500	Nitrate Of Soda Prilled	68572A: 5S2 (Sample)	0.0002 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Neutral
	SODIUM NITRATE		0.008 x 25 kg bags	UN Number	1498	Pack Group	III	CAS Number	7631-99-4		
OCPYRR2000	N-Octyl-2-Pyrrolidone	10456956PO: 8LB1 (Sample)	0.002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (contains 1-OCTYL-2-PYRROLIDINONE)		0.011111 x 180 kg drums	UN Number	3267	Pack Group	II	CAS Number	2687-94-7		
OILCEL1000	Celery Seed Oil "A" - 401/3321	100000131223: NSF23 (Sample) 1160012648/10: LAB (Sample)	0.00032 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	Celery seed Oil		0.032 x 10 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	8015-90-5		
OLEBPP1000	Oleoresin Black Pepper 40/20 - 401/603	1160006977/10: NSF22 (Sample)	0.00107 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	Oleoresins - Black Pepper		0.0535 x 20 kg pails	UN Number	N/A	Pack Group	N/A	CAS Number	84929-41-9		
PAFORM4000	Paraformaldehyde 91-93% Prills	S10262: LAB (Sample)	0.0004 tonne	Class	4.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	PARAFORMALDEHYDE		0.016 x 25 kg bags	UN Number	2213	Pack Group	III	CAS Number	30525-89-4		
PHACID0200	Phosphoric Acid 85% Food 330kg	14121201-2: 8LA1 (Sample)	0.0009 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	PHOSPHORIC ACID, SOLUTION		0.002727 x 330 kg drums	UN Number	1805	Pack Group	III	CAS Number	7664-38-2		
PHACID0300	Phosphoric Acid 85% Food 1700kg One-Way IBC	11030501-3: 8LA1 (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	PHOSPHORIC ACID, SOLUTION		0.000117 x 1700 kg IBCs	UN Number	1805	Pack Group	III	CAS Number	7664-38-2		
PHACID8702	Phosphoric Acid 81% FCC 1600kg	14121405-3: 8LA1 (Sample)	0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	PHOSPHORIC ACID, SOLUTION		0.000625 x 1600 kg IBCs	UN Number	1805	Pack Group	III	CAS Number	7664-38-2		
PHOACI8010	Phosphorous Acid 98.5% min	20150626: NS03 (Sample)	0.0004 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	PHOSPHOROUS ACID		0.016 x 25 kg bags	UN Number	2834	Pack Group	III	CAS Number	13598-36-2		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / PHTRME1000 to POPERM8300

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
PHTRME1000	Phenyltrimethylammonium Chloride	APTMA 11010: MEL (Sample)	0.0003 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	TOXIC SOLID, ORGANIC, N.O.S. (Phenyl Trimethyl Ammonium Chloride)	APTMA 11011: MEL (Sample) APTMA 11012: MEL (Sample)	0.012 x 25 kg drums	UN Number Poison Sch.	2811 N/A	Pack Group Hazchem	III 2X	CAS Number	138-24-9 T		
PINOIL1800	Pine Oil 65% Special Grade	1928688: LAB (Sample)	0.000278 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	PINE OIL		0.001544 x 180 kg drums	UN Number Poison Sch.	1272 5	Pack Group Hazchem	III 3Y	CAS Number	8002-09-3 Xi		
POBIFL1800	Potassium Bifluoride 99% Min	120320: 6S1 (Sample)	0.0003 tonne	Class	8	Sub. Risk(s)	6.1	Physical State	Solid	pH	Conc. Str. Acid
	POTASSIUM HYDROGEN DIFLUORIDE, SOLID	120321: 6S1 (Sample)	0.012 x 25 kg bags	UN Number Poison Sch.	1811 7	Pack Group Hazchem	II 2X	CAS Number	7789-29-9 T, C		
POHEBI5000	Polyhexamethylene Biguamide	S0909241401: NS37 (Sample)	0.00005 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	Acid
	POLYHEXAMETHYLENE BIGUANIDE HYDROCHLORIDE		0.00024 x 208 kg drums	UN Number Poison Sch.	N/A Not scheduled	Pack Group Hazchem	N/A N/A	CAS Number	27083-27-8 Xi, N		
PONITR1215	Potassium Nitrate powder with anticake	2326734: 4S1 (Sample)	0.0016 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE	Sample: LAB (Sample)	0.064 x 25 kg bags	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
PONITR1217	Potassium Nitrate 1-3mm Prill	2943813: LAB (Sample)	0.0245 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE		0.98 x 25 kg bags	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
PONITR2900	Potassium Nitrate + Anticake	116498A: 5S2 (Sample)	0.0002 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE		0.008 x 25 kg bags	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
PONITR6700	Potassium Nitrate Prills 25kg	63636B: 5S1 (Sample)	0.0001 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE		0.004 x 25 kg bags	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
PONITR7000	Potassium Nitrate Fine Prill	140727: QPBOX2 (Sample)	0.002 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE	2305630A: 5S1 (Sample)	0.08 x 25 kg bags	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
PONITR7200	Potassium Nitrate Fine Prill	133687A: QPBOX2 (Sample)	0.008 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE		0.006666 x 1200 kg bulkers	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
POPEOX9900	Pot Peroxymono Sulphate	L132435: 8SA1 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (Potassium Peroxomonosulfate)		0.02 x 25 kg bags	UN Number Poison Sch.	3260 6	Pack Group Hazchem	II 2X	CAS Number	70693-62-8 C		
POPERM8300	Pot. Permanganate USP Code C	S14639: 5S1 (Sample)	0.0003 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM PERMANGANATE		0.012 x 25 kg drums	UN Number Poison Sch.	1490 6	Pack Group Hazchem	II 1Y	CAS Number	7722-64-7 O, Xn, N		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / PPGMYR6000 to SOETXA9600

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
PPGMYR6000	TEGOSOFT PBE	JA02C28888: NS70 (Sample)	0.00025 tonne	Class	CL	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	Tegosoft PBE		0.001295 x 193 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	9003-13-8		
PRACID1000	Propionic Acid	02F0102801: 8LA3 (Sample)	0.002 tonne	Poison Sch.	N/A	Hazchem	N/A				
	PROPIONIC ACID		0.01 x 200 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
PRGALL3000	Propyl Gallate EP	PG/02/15: NS12 (Sample)	0.00001 tonne	UN Number	1848	Pack Group	III	CAS Number	79-09-4		
	TOXIC SOLID, ORGANIC, N.O.S. (PROPYL GALLATE)		0.0004 x 25 kg bags	Poison Sch.	6	Hazchem	•2W		Xi, C		
PRGLME9800	Propyleneglycol Monomethyl Ether	153227: LAB (Sample)	0.000005 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	1-METHOXY-2-PROPANOL		0.000026 x 190 kg drums	UN Number	2811	Pack Group	II	CAS Number	121-79-9		
SILWAX4000	ABIL WAX 9801	E516503777: NS70 (Sample)	0.0005 tonne	Poison Sch.	N/A	Hazchem	2XE		T, Xi		
	Abil Wax 9801		0.002777 x 180 kg drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
SOBICH0700	Sodium Bichromate Anh	92365: 6S1 (Sample)	0.00023 tonne	UN Number	3092	Pack Group	III	CAS Number	107-98-2		
	OXIDIZING SOLID, TOXIC, N.O.S.(SODIUM BICHROMATE)		0.0092 x 25 kg bags	Poison Sch.	N/A	Hazchem	•2Y				
SOCHIT8100	Sodium Chlorite 31% w/w Solution IBC	14102015: 8LA1 (Sample)	0.001 tonne	Class	CL	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	CHLORITE SOLUTION		0.002777 x 180 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	191044-49-2		
SODIIS2200	SDIC 60% 8-30 Mesh - 50kg Drum	84183A: 5S2 (Sample)	0.00023 tonne	Poison Sch.	Not scheduled	Hazchem	N/A				
	DICHLOROISOCYANURIC ACID, SALTS		0.0008 x 1250 kg IBCs	Class	5.1	Sub. Risk(s)	6.1	Physical State	Solid	pH	Acid
SODIIS9000	SDIC Anhydrous Granular 20-60	64299A: 5S2 (Sample)	0.00025 tonne	UN Number	3087	Pack Group	II	CAS Number	10588-01-9		
	DICHLOROISOCYANURIC ACID, SALTS		0.005 x 50 kg drums	Poison Sch.	6	Hazchem	2W		O, T+, N		
SODIME2000	Sod Dimethyldithiocarbamate	129192: 8LB1 (Sample)	0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
	CAUSTIC ALKALI LIQUID, N.O.S. (Sodium dimethyldithiocarbamate)		0.0008 x 1250 kg IBCs	UN Number	1908	Pack Group	II	CAS Number	7758-19-2		
SOETXA9600	S.E.X. Pellets 850kg Crates	20110610: LAB (Sample)	0.00025 tonne	Poison Sch.	5	Hazchem	2X		T, C, N		
	XANTHATES		0.005882 x 850 kg crates	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
		20110615: LAB (Sample)	0.00084 tonne	UN Number	2465	Pack Group	II	CAS Number	2893-78-9		
			0.0168 x 50 kg drums	Poison Sch.	6	Hazchem	1W		Xn, N, O		
			0.0002 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
			0.000166 x 1200 kg IBCs	UN Number	2465	Pack Group	II	CAS Number	2893-78-9		
				Poison Sch.	6	Hazchem	1W		Xn, N, O		
				Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
				UN Number	1719	Pack Group	II	CAS Number	128-04-1		
				Poison Sch.	Not scheduled	Hazchem	2R		C, N		
				Class	4.2	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
				UN Number	3342	Pack Group	III	CAS Number	140-90-9		
				Poison Sch.	N/A	Hazchem	1Y		Xn		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / SOFLUO1301 to SOLUTB2000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
SOFLUO1301	Sodium Fluoride Powder	93924: 6S1 (Sample)	0.0003 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Neutral
	SODIUM FLUORIDE, SOLID		0.012 x 25 kg bags	UN Number	1690	Pack Group	III	CAS Number	7681-49-4		
SOFLUO2900	Sodium Fluoride 98% Granular	S14725: 6S1 (Sample)	0.0005 tonne	Poison Sch.	6	Hazchem	2Z		T		
	SODIUM FLUORIDE, SOLID		0.02 x 25 kg bags	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Neutral
SOLAET1500	SLES 24-2NS/70	121256E: NL06 (Sample)	0.0002 tonne	UN Number	1690	Pack Group	III	CAS Number	7681-49-4		
	Sodium Lauryl Ether Sulphate		0.002 x 1000 kg IBCs	Poison Sch.	6	Hazchem	2Z		T		
SOLAET1800	SLES 24-2NS/70	121256E: NL06 (Sample)	0.002 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		0.002 x 1000 kg IBCs	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
SOLAET1800	SLES 24-3NS/70	2379: NL20 (Sample)	0.002 tonne	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
	Sodium Lauryl Ether Sulphate		0.020476 x 210 kg drums	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
SOLAET4500	SLES 70% 2EO IBC	8012033007: NL01 (Sample)	0.0043 tonne	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
	Sodium Lauryl Ether Sulphate		0.000727 x 1100 kg IBCs	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
SOLAET4500	SLES 70% 2EO IBC	8012033007: NL01 (Sample)	0.0008 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		0.000727 x 1100 kg IBCs	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
SOLAET4600	SLES 70% 3EO	5011121901: NS03 (Sample)	0.00015 tonne	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
	Sodium Lauryl Ether Sulphate		0.000882 x 170 kg drums	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
SOLAET4600	SLES 70% 3EO	5011121901: NS03 (Sample)	0.00015 tonne	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
	Sodium Lauryl Ether Sulphate		0.000882 x 170 kg drums	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
SOLAET4800	SLES 70% 2EO Natural	109385: NL07 (Sample)	0.0002 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		0.00125 x 160 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
SOLAET4800	SLES 70% 2EO Natural	109385: NL07 (Sample)	0.0002 tonne	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
	Sodium Lauryl Ether Sulphate		0.00125 x 160 kg drums	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
SOLAET8600	SLES 24-3NS/27 Drums	2409: NL20 (Sample)	0.004 tonne	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
	Sodium Lauryl Ether Sulphate		0.019047 x 210 kg drums	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
SOLAET8600	SLES 24-3NS/27 Drums	2409: NL20 (Sample)	0.004 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		0.019047 x 210 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
SOLAET8600	SLES 24-3NS/27 Drums	2409: NL20 (Sample)	0.004 tonne	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
	Sodium Lauryl Ether Sulphate		0.019047 x 210 kg drums	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
SOLUTB2000	Solution B	C24690: 5L1 (Sample)	0.001 tonne	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
	OXIDISING LIQUID, CORROSIVE, N.O.S. (PEROXIDE BLEND)		0.000833 x 1200 kg IBCs	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
SOLUTB2000	Solution B	C24690: 5L1 (Sample)	0.001 tonne	Class	5.1	Sub. Risk(s)	8	Physical State	Liquid	pH	N/A
	OXIDISING LIQUID, CORROSIVE, N.O.S. (PEROXIDE BLEND)		0.000833 x 1200 kg IBCs	UN Number	3098	Pack Group	II	CAS Number	7722-84-1		
SOLUTB2000	Solution B	C24690: 5L1 (Sample)	0.001 tonne	Poison Sch.	5	Hazchem	2P		O, C		
	OXIDISING LIQUID, CORROSIVE, N.O.S. (PEROXIDE BLEND)		0.000833 x 1200 kg IBCs	Class	5.1	Sub. Risk(s)	8	Physical State	Liquid	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / SOMESI5800 to SOPERC6700

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
SOMESI5800	Sodium Metasilicate Anh Gran DISODIUM TRIOXOSILICATE	106386B: 8SB1 (Sample)	0.00035 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str.
			0.014 x 25 kg bags	UN Number	3253	Pack Group	III	CAS Number	6834-92-0		Alkali
SOMOAC2500	Sod. Monochloro Acetate 98.5% SODIUM CHLOROACETATE	90082: 6S1 (Sample)	0.0008 tonne	Poison Sch.	5	Hazchem	2X		C		
			0.032 x 25 kg bags	UN Number	2659	Pack Group	III	CAS Number	3926-62-3		
SOMOAC3000	Sod Monochloro Acetate SODIUM CHLOROACETATE	92632: 6S1 (Sample)	0.00025 tonne	Poison Sch.	N/A	Hazchem	2Z		T, N, Repr. 2		
			0.0125 x 20 kg bags	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
SOMOAC5000	Sod Monochloro Acetate SODIUM CHLOROACETATE	130681: 6S1 (Sample)	0.0008 tonne	UN Number	2659	Pack Group	III	CAS Number	3926-62-3		
			0.04 x 20 kg bags	Poison Sch.	N/A	Hazchem	2Z		T, N, Repr. 2		
SONITF3000	Sodium Nitrite FCC SODIUM NITRITE	1027537801: 4S1 (Sample)	25 kg	Class	5.1	Sub. Risk(s)	6.1	Physical State	Solid	pH	Alkali
			1 x 25 kg cartons	UN Number	1500	Pack Group	III	CAS Number	7632-00-0		
SONITF3100	Sodium Nitrite FCC SODIUM NITRITE	102879B: 5S1 (Sample)	0.1 kg	Poison Sch.	7	Hazchem	1Z		O, T, N		
			0.004 x 25 kg cartons	Class	5.1	Sub. Risk(s)	6.1	Physical State	Solid	pH	Alkali
SONITR2000	Sodium Nitrite HQ - Technical SODIUM NITRITE	2153654: 5S1 (Sample)	0.0003 tonne	UN Number	1500	Pack Group	III	CAS Number	7632-00-0		
			0.012 x 25 kg bags	Poison Sch.	7	Hazchem	1Z		O, T, N		
SONITR9100	Sodium Nitrite - No Anticaking SODIUM NITRITE	3097601: 4S1 (Sample)	0.05 tonne	Class	5.1	Sub. Risk(s)	6.1	Physical State	Solid	pH	Alkali
			2 x 25 kg bags	UN Number	1500	Pack Group	III	CAS Number	7632-00-0		
SONITR9600	Sodium Nitrite Prilled SODIUM NITRITE	97167: 5S3 (Sample)	0.022 tonne	Poison Sch.	7	Hazchem	1Z		O, T, N		
			0.88 x 25 kg bags	Class	5.1	Sub. Risk(s)	6.1	Physical State	Solid	pH	Alkali
SOPERC4400	Sodium Percarbonate Coated SODIUM CARBONATE PEROXYHYDRATE	1877951: 5S1 (Sample)	0.001 tonne	UN Number	1500	Pack Group	III	CAS Number	7632-00-0		
			0.04 x 25 kg bags	Poison Sch.	7	Hazchem	1Z		O, T, N		
SOPERC4600	Sodium Percarbonate Tablet SODIUM CARBONATE PEROXYHYDRATE	41HY14-156: 5S1 (Sample)	0.0006 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
			0.024 x 25 kg cartons	UN Number	3378	Pack Group	II	CAS Number	15630-89-4		
SOPERC6500	Sodium Percarbonate Coated SODIUM CARBONATE PEROXYHYDRATE	117691C: 5S2 (Sample)	0.0005 tonne	Poison Sch.	6	Hazchem	1Y		O, Xn, Xi		
			0.000454 x 1100 kg bulkers	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
SOPERC6700	Sodium Percarbonate Coated SODIUM CARBONATE PEROXYHYDRATE	124358: 5S1 (Sample) 126420: 5S1 (Sample)	0.0013 tonne	UN Number	3378	Pack Group	II	CAS Number	15630-89-4		
			0.052 x 25 kg bags	Poison Sch.	6	Hazchem	1Y		O, Xn, Xi		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / SOPERM6500 to THDIOX3000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
SOPERM6500	Sodium Perborate Monohydrate	S12857: 5S2 (Sample)	0.001 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	SODIUM PERBORATE MONOHYDRATE		0.04 x 25 kg bags	UN Number	3377	Pack Group	III	CAS Number	10332-33-9		
SOSELA1200	Sodium Selenate Ag Grade	S13893: 6S1 (Sample)	0.0002 tonne	Poison Sch.	N/A	Hazchem	1Z		O, T		
	SELENATES		0.008 x 25 kg drums	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
SOSELC1500	Sil Sel 1% RBP	87265: 6S1 (Sample)	0.00016 tonne	UN Number	2630	Pack Group	I	CAS Number	13410-01-0		
	TOXIC SOLID, INORGANIC, N.O.S. (Contains Sodium Selenite)		0.0064 x 25 kg bags	Poison Sch.	7	Hazchem	2X		T, N		
SOSILI1000	Sodium Silicofluoride	109224: 6S1 (Sample)	0.0003 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	SODIUM FLUOROSILICATE		0.012 x 25 kg bags	UN Number	2674	Pack Group	III	CAS Number	16893-85-9		
SOSILI1100	Sodium Silicofluoride	104824L: 6S1 (Sample) 117576A: 6S1 (Sample)	0.00074 tonne	Poison Sch.	6	Hazchem	2X		T		
	SODIUM FLUOROSILICATE		0.00074 x 1000 kg bulkers	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
SOSILI5000	Sodium Silicofluoride	82303: 6S1 (Sample)	0.00015 tonne	UN Number	2674	Pack Group	III	CAS Number	16893-85-9		
	SODIUM FLUOROSILICATE		0.006 x 25 kg bags	Poison Sch.	6	Hazchem	2X		T		
STAMID1000	Stearamidopropyl Dimethylamine	S0908171731: NS42 (Sample)	0.0004 tonne	Class	9	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. Stearamidopropyl Dimethylamine		0.026666 x 15 kg bags	UN Number	3077	Pack Group	III	CAS Number	7651-02-7		
SUFBIO1000	REWOCID WK 30	ES63A02817: NS70 (Sample)	0.00075 tonne	Poison Sch.	N/A	Hazchem	2Z				
	CORROSIVE LIQUID, N.O.S. (microbicidal amphoteric surfactants)		0.003658 x 205 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
SULACI1917	SULPHURIC ACID 70% 200L Drums	2382143: LAB (Sample)	0.038648 KLTR	UN Number	1760	Pack Group	II	CAS Number	Various		
	SULPHURIC ACID with more than 51% acid		0.19324 x 200 L drums	Poison Sch.	N/A	Hazchem	2X		C, N		
SULPHU0200	Sulphur Ultraventilated Oil1%	100989: 4S1 (Sample) 71800: NS55 (Sample)	0.0015 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	SULPHUR		0.06 x 25 kg bags	UN Number	1830	Pack Group	II	CAS Number	7664-93-9		
SULPHU1400	Rgs Regular Sulphur Pwd 25kg	112936B: LAB (Sample)	0.0001 tonne	Poison Sch.	6	Hazchem	2P		C		
	SULPHUR		0.004 x 25 kg bags	Class	4.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
THDIOX3000	Thiourea Dioxide - 25kg Bags	86604: 4S1 (Sample)	0.00007 tonne	UN Number	1350	Pack Group	III	CAS Number	7704-34-9		
	THIOUREA DIOXIDE		0.0028 x 25 kg bags	Poison Sch.	N/A	Hazchem	1Z		Xi		
				Class	4.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
				UN Number	1350	Pack Group	III	CAS Number	7704-34-9		
				Poison Sch.	N/A	Hazchem	1Z		Xi		
				Class	4.2	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
				UN Number	3341	Pack Group	II	CAS Number	1758-73-2		
				Poison Sch.	6	Hazchem	1Y		Xn, Xi		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / THDIOX4000 to ZICHLO3300

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
THDIOX4000	Thiourea Dioxide 95% Min THIOUREA DIOXIDE	78885: 4S1 (Sample)	0.0001 tonne	Class	4.2	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
			0.004 x 25 kg bags	UN Number	3341	Pack Group	II	CAS Number	1758-73-2		
THDIOX5000	Thiourea Dioxide 90% Min THIOUREA DIOXIDE	78886: 4S1 (Sample)	0.0001 tonne	Poison Sch.	6	Hazchem	1Y		Xn, Xi		
			0.004 x 25 kg bags	Class	4.2	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
THIOUR7000	Thiourea TOXIC SOLID, ORGANIC, N.O.S. (Thiourea)	133039: 6S1 (Sample) 136514: 6S1 (Sample)	0.001 tonne	UN Number	3341	Pack Group	II	CAS Number	1758-73-2		
			0.04 x 25 kg bags	Poison Sch.	6	Hazchem	1Y		Xn, Xi		
TRCHIS6501	TCCA-200g Tabs (1kg Soft Inner) TRICHLOROISOCYANURIC ACID, DRY	82298B: 5S2 (Sample)	0.001 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
			0.04 x 25 kg bags	UN Number	2811	Pack Group	III	CAS Number	62-56-6		
VAPENT8100	Vanadium Pentoxide Granular VANADIUM PENTOXIDE, non-fused form	78930: 6S1 (Sample)	0.001 tonne	Poison Sch.	6	Hazchem	2X		Xn, N		
			0.008 x 50 kg drums	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
VITDCA2100	Vitamin D3 500 VITAMIN D3	S14639: NSF04 (Sample)	0.0004 tonne	UN Number	2468	Pack Group	II	CAS Number	87-90-1		
			0.008 x 50 kg drums	Poison Sch.	N/A	Hazchem	1W		O, Xn, N		
ZICHLO0300	Zinc Chloride 98% Min ZINC CHLORIDE, ANHYDROUS	S14887: 8SA2 (Sample)	0.0003 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
			0.001875 x 160 kg drums	UN Number	2862	Pack Group	III	CAS Number	1314-62-1		
ZICHLO2600	Zinc Chloride ZINC CHLORIDE, ANHYDROUS	110547: 8SA1 (Sample)	0.2 kg	Poison Sch.	N/A	Hazchem	2X		T, N, Muta. 3, Repr. 3		
			0.008 x 25 kg drums	Class	CL	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
ZICHLO3300	Zinc Chloride Pwd 98.5% Min ZINC CHLORIDE, ANHYDROUS	S14887: 8SA2 (Sample)	0.0005 tonne	UN Number	N/A	Pack Group	N/A	CAS Number	Mixture		
			0.02 x 25 kg bags	Poison Sch.	Not schedule d	Hazchem	N/A				
ZICHLO2600	Zinc Chloride ZINC CHLORIDE, ANHYDROUS	110547: 8SA1 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Acid
			0.016 x 25 kg bags	UN Number	2331	Pack Group	III	CAS Number	7646-85-7		
ZICHLO3300	Zinc Chloride Pwd 98.5% Min ZINC CHLORIDE, ANHYDROUS	S14887: 8SA2 (Sample)	0.0004 tonne	Poison Sch.	6	Hazchem	2X		C, N, Xn		
			0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Acid
ZICHLO3300	Zinc Chloride Pwd 98.5% Min ZINC CHLORIDE, ANHYDROUS	S14887: 8SA2 (Sample)	0.001 tonne	UN Number	2331	Pack Group	III	CAS Number	7646-85-7		
			0.04 x 25 kg bags	Poison Sch.	6	Hazchem	2X		C, N, Xn		

Dangerous Goods Stock Manifest

Stock Summary

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Class	Sub. Risks	Pack Group	Quantity Packaged		Quantity Bulk	
			Weight (kg)	Volume (L)	Weight (kg)	Volume (L)
5.1		II	0.100	0.132		
5.1	6.1	III	3,470.000	5,019.014		
5.1	8	II	4,400.000	5,560.000		
8		II	496,433.868	434,370.286	103,907.000	74,224.989
8		III	449,137.663	400,880.460	78,140.380	54,194.100
8	3	II	18,387.000	28,674.500		
8	5.1	II	1,960.000	1,518.000		
8	Combustible Liquid (CL)	III	4,999.999	5,742.719		
9		III	875.000	266.000		
Combustible Liquid (CL)			1,020.000	957.700		

Dangerous Goods Stock Manifest

Stock by Building

Building Bulk Store / CAUSOB1000 to SULACB5000

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CAUSOB1000	Caustic Soda Liquid 50% Bulk SODIUM HYDROXIDE SOLUTION	3102846: F11-13 (AGT) 3253099D: F11-13 (AGT) 3253099E: F11-13 (AGT) 3253099F: F11-13 (AGT) 3253099G: F11-13 (AGT)	69.214 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			69214 x 1 kg bulk	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2R		C		
CAUSOD1872	Caustic Soda 50% (NSW) Bulk kg SODIUM HYDROXIDE SOLUTION	3253104B: F11-13 (AGT)	3.69 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			3690 x 1 kg bulk	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2R		C		
FECHSO2700	Ferric Chloride 42% Solution FERRIC CHLORIDE SOLUTION	3246260: F17 (AGT) 3246265: F17 (AGT) 3250137: F17 (AGT) 3820363: F17 (AGT) 3820783: F17 (AGT)	57.631 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			57631 x 1 kg bulk	UN Number	2582	Pack Group	III	CAS Number	7705-08-0		
				Poison Sch.	5	Hazchem	2X		C		
PHACID1104	Phosphoric Acid 75% Solution PHOSPHORIC ACID, SOLUTION	3804973: F03 (AGT)	6.23 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			6230 x 1 kg bulk	UN Number	1805	Pack Group	III	CAS Number	7664-38-2		
				Poison Sch.	6	Hazchem	2R		C		
SOHYCL1823	SODIUM HYPOCHLORITE 12.5% BULK HYPOCHLORITE SOLUTION	3816789: F14-15 (AGT)	1.041 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
			1041 x 1 L bulk	UN Number	1791	Pack Group	III	CAS Number			
				Poison Sch.	6	Hazchem	2X		C, N		
SULACB5000	Sulphuric Acid 98% Bulk SULPHURIC ACID with more than 51% acid	3814748: F16 (AGT)	1.623 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			1623 x 1 kg bulk	UN Number	1830	Pack Group	II	CAS Number	7664-93-9		
				Poison Sch.	6	Hazchem	2P		C		

Dangerous Goods Stock Manifest

Stock by Building

Building Default / CAUSOD1857 to NIACID5513

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification							
	Proper Shipping Name		Packs									
CAUSOD1857	Caustic Soda Liquid 50% 1530kg IBC (Returnable)	3803765: Default	1.53 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str.	Alkali
	SODIUM HYDROXIDE SOLUTION		1 x 1530 kg IBCs	UN Number	1824	Pack Group	II	CAS Number	1310-73-2			
FLSIAC1701	Fluorosilicic Acid 27% Bulk	3805848: Default	0.03 tonne	Poison Sch.	6	Hazchem	2R		C			
	FLUOROSILICIC ACID		30 x 1 kg bulk	UN Number	1778	Pack Group	II	CAS Number	16961-83-4			
HYACID1900	Hydrochloric Acid 33%, 240 kg Drums	3010383: Default (Reject)	0.24 tonne	Poison Sch.	7	Hazchem	2X	Physical State	Liquid	pH	Conc. Str.	Acid
	HYDROCHLORIC ACID		1 x 240 kg drums	UN Number	1789	Pack Group	II	CAS Number	7647-01-0			
NIACID5513	Nitric Acid 68%	3820255: Default	1.4 tonne	Poison Sch.	6	Hazchem	2R		C			
	NITRIC ACID other than red fuming, with at least 65% but not more than 70% nitric acid		1 x 1400 kg IBCs	UN Number	2031	Pack Group	II	CAS Number	7697-37-2			
				Poison Sch.	6	Hazchem	2R		O, C			

Dangerous Goods Stock Manifest

Stock by Building

Building Front Warehouse / ACACID1892 to AMAQUI7501

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACACID1892	ACETIC ACID 90% 200kg Drums	3110036B: B	0.037 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
	ACETIC ACID SOLUTION, more than 80% acid, by mass		0.185 x 200 kg drums	UN Number	2789	Pack Group	II	CAS Number	64-19-7		
ACACID1916	Acetic Acid 75% 1000kg Returnable IBC	3814881: B	8 tonne	Poison Sch.	6	Hazchem	•2P		C, C		
	ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass		8 x 1000 kg IBCs	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
ACACID2200	Acetic Acid 25% - Gas 25	3001628: B	1 tonne	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
	ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass		1 x 1000 kg IBCs	Poison Sch.	5	Hazchem	2R		C		
ACACID5801	Acetic Acid 55% solution	3148429: B	2.08 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass		2 x 1040 kg IBCs	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
ACACID6400	Acetic Acid 45% 1000kg IBC	3807098: B 3810733: B	7 tonne	Poison Sch.	5	Hazchem	2R		C		
	ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass		7 x 1000 kg IBCs	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
ACACID7400	Acetic Acid 75% 1000kg IBC (One-way)	3195099: B	3 tonne	UN Number	2790	Pack Group	III	CAS Number	64-19-7		
	ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass		3 x 1000 kg IBCs	Poison Sch.	5	Hazchem	2R		C		
AMAEUE1836	AMMONIA 25%	3237417: E	7.98 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		42 x 190 kg drums	UN Number	2672	Pack Group	III	CAS Number	1336-21-6		
AMAEUE8201	Ammonia Aqueous Pl.Mauser (200Kpa)	3118776B: E	8.19 tonne	Poison Sch.	6	Hazchem	2R		C, N		
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		39 x 210 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
AMAEUE17002	Ammonia Aqueous 23% IBC	3213949: E	24.57 tonne	UN Number	2672	Pack Group	III	CAS Number	1336-21-6		
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		27 x 910 kg IBCs	Poison Sch.	6	Hazchem	2R		C, N		
AMAEUE17501	Ammonia Aqueous 24% Full Metal	3091376B: E	0.91 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		1 x 910 kg IBCs	UN Number	2672	Pack Group	III	CAS Number	1336-21-6		
				Poison Sch.	6	Hazchem	2R		C, N		

Dangerous Goods Stock Manifest

Stock by Building

Building Front Warehouse / CAPOTA1805 to CAUSOD1852

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CAPOTA1805	POTASSIUM HYDROXIDE 48% 200L Drum POTASSIUM HYDROXIDE SOLUTION	3059964: E	0.6 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
			3 x 200 L drums	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
				Poison Sch.	6	Hazchem	2R		C		
CAPOTA1807	POTASSIUM HYDROXIDE 48% 300kg Drum POTASSIUM HYDROXIDE SOLUTION	3166717: E	0.3 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
			1 x 300 kg drums	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
				Poison Sch.	6	Hazchem	2R		C		
CAPOTA1808	POTASSIUM HYDROXIDE 48% 1000kg IBC POTASSIUM HYDROXIDE SOLUTION	3150157: E	1 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
			1 x 1000 kg IBCs	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
				Poison Sch.	6	Hazchem	2R		C		
CAPOTA1822	POTASSIUM HYDROXIDE 20% 200L Drums POTASSIUM HYDROXIDE SOLUTION	3131122: E 3214908: E	2.8 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
			14 x 200 L drums	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
				Poison Sch.	6	Hazchem	2R		C		
CAPOTA1901	Caustic Potash Flake 1000kg POTASSIUM HYDROXIDE, SOLID	20160906: E	2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
			2 x 1000 kg bulkers	UN Number	1813	Pack Group	II	CAS Number	1310-58-3		
				Poison Sch.	N/A	Hazchem	2W		C		
CASODA5300	Caustic Soda Micropearl 1000Kg SODIUM HYDROXIDE, SOLID	151558B: E (Reject)	1 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			1 x 1000 kg bulkers	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2W		C		
CASODA5301	Caustic Soda Micropearl 1000Kg SODIUM HYDROXIDE, SOLID	2754878: E (Reject)	0.725 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			0.725 x 1000 kg bulkers	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2W		C		
CAUSOD1700	Caustic Soda Liquid 50% 1500kg IBC (One-Way) SODIUM HYDROXIDE SOLUTION	3190689B: E	9 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			6 x 1500 kg IBCs	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2R		C		
CAUSOD1839	Caustic Soda Liquid 30% 20L Carboys SODIUM HYDROXIDE SOLUTION	3197344: E	0.2 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			10 x 20 L carboys	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2R		C		
CAUSOD1841	Caustic Soda Liquid 30% 200L Drums SODIUM HYDROXIDE SOLUTION	3233015: E	3.2 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			16 x 200 L drums	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2R		C		
CAUSOD1852	Caustic Soda Liquid 50% 20L Carboys SODIUM HYDROXIDE SOLUTION	3812239: E	1.48 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			74 x 20 L carboys	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2R		C		

Dangerous Goods Stock Manifest

Stock by Building

Building Front Warehouse / CAUSOD1854 to SOCHIT1824

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
CAUSOD1854	Caustic Soda Liquid 50% 200L Drums SODIUM HYDROXIDE SOLUTION	3218365: E	1.8 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			9 x 200 L drums	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD1914	Caustic Soda Liquid 50% 300kg Drums SODIUM HYDROXIDE SOLUTION	3091032: E 3198399: E	5.4 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			18 x 300 kg drums	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD8901	Caustic Soda Liquid 10% 220kg Mausers SODIUM HYDROXIDE SOLUTION	3209139: E 3814537: E	18.26 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			83 x 220 kg drums	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
FORMIC1832	Formic Acid 10% 1000kg Returnable IBCs FORMIC ACID with not less than 5% but less than 10% acid by mass	3814573: B	6 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
			6 x 1000 kg IBCs	UN Number	3412	Pack Group	III	CAS Number	64-18-6		
HYACIB9602	Hydrochloric Acid 35% IBC HYDROCHLORIC ACID	3156251: B	9.12 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			8 x 1140 kg IBCs	UN Number	1789	Pack Group	II	CAS Number	7647-01-0		
PHACID0900	Phosphoric Acid 85% FCC 1700kg One-Way IBC PHOSPHORIC ACID, SOLUTION	45CX1607045: B	28.9 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			17 x 1700 kg IBCs	UN Number	1805	Pack Group	III	CAS Number	7664-38-2		
PHACID8705	Phosphoric Acid 81% FCC 1650Kg PHOSPHORIC ACID, SOLUTION	45CX1607045: B	21.45 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			13 x 1650 kg IBCs	UN Number	1805	Pack Group	III	CAS Number	7664-38-2		
SOCHIT1811	SODIUM CHLORITE 7.5% 20L Carboys CHLORITE SOLUTION	3102092: E	120 L	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			6 x 20 L carboys	UN Number	1908	Pack Group	III	CAS Number	7758-19-2		
SOCHIT1815	SODIUM CHLORITE 31% 20L Carboys CHLORITE SOLUTION	3186158: E 3238609: E	680 L	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			34 x 20 L carboys	UN Number	1908	Pack Group	II	CAS Number	7758-19-2		
SOCHIT1824	SODIUM CHLORITE 25% CHLORITE SOLUTION	20160801: E	22.5 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			18 x 1250 kg IBCs	UN Number	1908	Pack Group	II	CAS Number	7758-19-2		

Dangerous Goods Stock Manifest

Stock by Building

Building Front Warehouse / SOCHIT1827 to
SULACI1817

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs		Hazard Classification							
SOCHIT1827	Sodium Chlorite 31% w/w solution 1250kg IBC CHLORITE SOLUTION	20160719: E 20160815: E	53.75 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str.	Alkali
			43 x 1250 kg IBCs	UN Number	1908	Pack Group	II	CAS Number	7758-19-2			
SOHYCL1812	SODIUM HYPOCHLORITE 12.5% one-way IBC HYPOCHLORITE SOLUTION	3198992: E	1 KLTR	Poison Sch.	5	Hazchem	2X		T, C, N			Alkali
			1 x 1000 L IBCs	UN Number	1791	Pack Group	III	CAS Number				
SOHYCL1832	SODIUM HYPOCHLORITE 12.5% 200L Drums Non Returnable HYPOCHLORITE SOLUTION	3240674: E 3258718: E	4.4 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali	
			22 x 200 L drums	UN Number	1791	Pack Group	III	CAS Number				
SOHYCL1832	SODIUM HYPOCHLORITE 12.5% 200L Drums Non Returnable HYPOCHLORITE SOLUTION	3069016: E (Reject)	0.2 KLTR	Poison Sch.	6	Hazchem	2X		C, N			
			1 x 200 L drums	UN Number	1791	Pack Group	III	CAS Number				
SOHYCL1838	SODIUM HYPOCHLORITE 12.5% 20L Non Returnable Carboys HYPOCHLORITE SOLUTION	3179096: E	0.64 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali	
			32 x 20 L carboys	UN Number	1791	Pack Group	III	CAS Number				
SOHYCL1861	SODIUM HYPOCHLORITE 12.5% 200L Drums Non Returnable HYPOCHLORITE SOLUTION	3812381: E	4.8 KLTR	Poison Sch.	6	Hazchem	2X		C, N			
			24 x 200 L drums	UN Number	1791	Pack Group	III	CAS Number				
SUACID1900	Sulphamic Acid Ind 500kg bulkers SULPHAMIC ACID	3166010: B	4 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid	
			8 x 500 kg bulkers	UN Number	2967	Pack Group	III	CAS Number	5329-14-6			
SUACID1900	Sulphamic Acid Ind 500kg bulkers SULPHAMIC ACID	3166010: B	32 tonne	Poison Sch.	6	Hazchem	2X		Xi			
			64 x 500 kg bulkers	UN Number	2967	Pack Group	III	CAS Number	5329-14-6			
SUACID2050	Sulphamic Acid SULPHAMIC ACID	3179583: B	0.5 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid	
			20 x 25 kg bags	UN Number	2967	Pack Group	III	CAS Number	5329-14-6			
SUACID9000	Sulphamic Acid - 25kg SULPHAMIC ACID	2993627: B 3222872: E	1.45 tonne	Poison Sch.	6	Hazchem	2X		Xi			
			58 x 25 kg bags	UN Number	2967	Pack Group	III	CAS Number	5329-14-6			
SULACI1705	Sulphuric Acid 5% v/v returnable IBC SULPHURIC ACID with not more than 51% acid	3192469: B 3212431: B	3 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str.	Acid
			3 x 1000 L IBCs	UN Number	2796	Pack Group	II	CAS Number	7664-93-9			
SULACI1817	SULPHURIC ACID 34.5% 200L Drums SULPHURIC ACID with not more than 51% acid	3170870: B 3198025: B	1.8 KLTR	Poison Sch.	6	Hazchem	2R		C			Conc. Str. Acid
			9 x 200 L drums	UN Number	2796	Pack Group	II	CAS Number	7664-93-9			
				Poison Sch.	6	Hazchem	2R		C			

Dangerous Goods Stock Manifest

Stock by Building

Building Front Warehouse / SULACI1832 to ZISULP1809

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
SULACI1832	SULPHURIC ACID 98% 10L Carboy SULPHURIC ACID with more than 51% acid	3188758: B 3233945: B	0.12 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			12 x 10 L carboys	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1851	Sulphuric Acid 50% 1000L Returnable IBC SULPHURIC ACID with not more than 51% acid	3238028: B 3815963: B	4 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			4 x 1000 L IBCs	UN Number Poison Sch.	2796 6	Pack Group Hazchem	II 2R	CAS Number	7664-93-9 C		
SULACI1854	SULPHURIC ACID 60% 200L DRUMS SULPHURIC ACID with more than 51% acid	3247746: B	0.4 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 200 L drums	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1855	SULPHURIC ACID 60% 1000L One-Way IBC SULPHURIC ACID with more than 51% acid	3193003: B 3194721: B	4 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			4 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1917	SULPHURIC ACID 70% 200L Drums SULPHURIC ACID with more than 51% acid	3171792: B	1.2 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			6 x 200 L drums	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1959	SULPHURIC ACID 60% 1000L Returnable IBC SULPHURIC ACID with more than 51% acid	3101219: B	2 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1993	SULPHURIC ACID 70% 1000L 1-way IBC SULPHURIC ACID with more than 51% acid	3248310: B 3253465: B	8.405 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			8.405 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI4203	Sulphuric Acid 60% 1500kg IBC (Cust. INTEG SA 60) SULPHURIC ACID with more than 51% acid	3241345: B	4.5 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			3 x 1500 kg IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
TRETAM1836	TRIETHANOLAMINE 50% 1020kg Returnable IBC Triethanolamine 50%	3244460: E	1.02 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
			1 x 1020 kg IBCs	UN Number Poison Sch.	N/A 5	Pack Group Hazchem	N/A N/A	CAS Number	Mixture Xn		
URPHOS4000	Urea Phosphate 40% w/w Solution CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.(Contains 25% Phosphoric Acid)	3248748: B	10.71 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			9 x 1190 kg IBCs	UN Number Poison Sch.	3264 5	Pack Group Hazchem	III 2X	CAS Number	4861-19-2 C		
ZISULP1809	ZINC SULPHATE MONO PWD ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc Sulphate)	712414 : E	0.875 tonne	Class	9	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
			35 x 25 kg bags	UN Number Poison Sch.	3077 6	Pack Group Hazchem	III 2Z	CAS Number	7446-19-7 Xn, N		

Dangerous Goods Stock Manifest

Stock by Building

Building Mid Warehouse / ACACID1863 to CAUSOD1856

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACACID1863	ACETIC ACID GLACIAL 200kg Drums	2929656D: F	10.88 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
	ACETIC ACID, GLACIAL	3011772B: F 3166120B: T	54.4 x 200 kg drums	UN Number	2789	Pack Group	II	CAS Number	64-19-7		
AMAEUE5521	Ammonia Aqueous	3202946B: D	8.46 tonne	Poison Sch.	6	Hazchem	•2P		C		
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		423 x 20 kg pails	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
AMAQUI7501	Ammonia Aqueous 24% Full Metal	3202946A: D	9.1 tonne	UN Number	2672	Pack Group	III	CAS Number	1336-21-6		
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		10 x 910 kg IBCs	Poison Sch.	6	Hazchem	2R		C, N		
CAPOTA1808	POTASSIUM HYDROXIDE 48% 1000kg IBC	3150157: D	8 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	POTASSIUM HYDROXIDE SOLUTION	3206017: D	8 x 1000 kg IBCs	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
CAPOTA1809	POTASSIUM HYDROXIDE 48% 1000L IBC	3248336: D	12 KLTR	Poison Sch.	6	Hazchem	2R		C		
	POTASSIUM HYDROXIDE SOLUTION	3815627: D	12 x 1000 L IBCs	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
CAUSOD1823	Caustic Soda Liquid 46% 1000L IBC (Returnable)	3159825: D	12 KLTR	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
	SODIUM HYDROXIDE SOLUTION	3248772: D	12 x 1000 L IBCs	Poison Sch.	6	Hazchem	2R		C		
CAUSOD1831	Caustic Soda Liquid 25% Bulk (kg)	3811255: F	17.86 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE SOLUTION		17860 x 1 kg bulk	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD1831	Caustic Soda Liquid 25% Bulk (kg)	2121849: D (Reject)	1 tonne	Poison Sch.	6	Hazchem	2R		C		
	SODIUM HYDROXIDE SOLUTION		1000 x 1 kg bulk	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
CAUSOD1842	Caustic Soda Liquid 30% 1000L IBC (Returnable)	3227022: D	1 KLTR	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
	SODIUM HYDROXIDE SOLUTION		1 x 1000 L IBCs	Poison Sch.	6	Hazchem	2R		C		
CAUSOD1843	Caustic Soda Liquid 30% 1000L IBC (One-Way)	3211417: D	1 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE SOLUTION		1 x 1000 L IBCs	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD1856	Caustic Soda Liquid 50% 1000L IBC (Returnable)	3817216: D	14 KLTR	Poison Sch.	6	Hazchem	2R		C		
	SODIUM HYDROXIDE SOLUTION		14 x 1000 L IBCs	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
				UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2R		C		

Dangerous Goods Stock Manifest

Stock by Building

Building Mid Warehouse / CAUSOD1856 to GASOLN2010

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CAUSOD1856	Caustic Soda Liquid 50% 1000L IBC (Returnable) SODIUM HYDROXIDE SOLUTION	2929495: D (Reject)	0.3 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.3 x 1000 L IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOD1857	Caustic Soda Liquid 50% 1530kg IBC (Returnable) SODIUM HYDROXIDE SOLUTION	2730351: D (Reject)	1.072 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.700653 x 1530 kg IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOD1857	Caustic Soda Liquid 50% 1530kg IBC (Returnable) SODIUM HYDROXIDE SOLUTION	3247229: D 3809701: D	18.36 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			12 x 1530 kg IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOD1894	Caustic Soda Liquid 25% 1000L IBC (Returnable) SODIUM HYDROXIDE SOLUTION	3182190: D	3 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			3 x 1000 L IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOD1912	Caustic Soda Liquid 50% 1530kg IBC (One-Way) SODIUM HYDROXIDE SOLUTION	3814749: D	9.18 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			6 x 1530 kg IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOD1915	Caustic Soda Liquid 30% 800L IBC (Returnable - Nylex) SODIUM HYDROXIDE SOLUTION	3247239: D	0.8 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			1 x 800 L IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOI2001	Caustic Soda Liquid 20% 1220kg IBC (One-Way) SODIUM HYDROXIDE SOLUTION	3115527: D	2.44 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			2 x 1220 kg IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
FECHSO2505	Ferric Chloride 42% Solution FERRIC CHLORIDE SOLUTION	3225325: C	12.6 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			9 x 1400 kg IBCs	UN Number Poison Sch.	2582 5	Pack Group Hazchem	III 2X	CAS Number	7705-08-0 C		
FLSIAC1700	Fluorosilicic Acid 27% One-way IBCs FLUOROSILICIC ACID	3199396B: C	3.75 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			3 x 1250 kg IBCs	UN Number Poison Sch.	1778 7	Pack Group Hazchem	II 2X	CAS Number	16961-83-4 C		
FORMIC3700	Formic Acid 85% 1200kg IBC FORMIC ACID with more than 85% acid by mass	3148507B: T	1.47 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
			1.225 x 1200 kg IBCs	UN Number Poison Sch.	1779 5	Pack Group Hazchem	II ●2W	CAS Number	64-18-6 C		
GASOLN2010	Gassing Solution OXIDIZING LIQUID, TOXIC, N.O.S. (SODIUM THIOCYANATE AND SODIUM NITRITE)	3170883: T	0.39 tonne	Class	5.1	Sub. Risk(s)	6.1	Physical State	Liquid	pH	Neutral
			0.356164 x 1095 kg IBCs	UN Number Poison Sch.	3099 6	Pack Group Hazchem	III 2W	CAS Number	T, N, O		

Dangerous Goods Stock Manifest

Stock by Building

Building Mid Warehouse / HYPERT6200 to TOLYLI1200

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
HYPERT6200	Hydrogen Peroxide 50% - 1100kg	16073331: T	4.4 tonne	Class	5.1	Sub. Risk(s)	8	Physical State	Liquid	pH	Conc. Str. Acid
	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)	16082350: T	4 x 1100 kg IBCs	UN Number	2014	Pack Group	II	CAS Number	7722-84-1		
SOHYCL1812	SODIUM HYPOCHLORITE 12.5% one-way IBC	3239772: D	6 KLTR	Poison Sch.	6	Hazchem	2P		O, C		
	HYPOCHLORITE SOLUTION	3252005: D	6 x 1000 L IBCs	UN Number	1791	Pack Group	III	Physical State	Liquid	pH	Alkali
SOHYCL1812	SODIUM HYPOCHLORITE 12.5% one-way IBC	2964331: D (Reject)	2 KLTR	Poison Sch.	6	Hazchem	2X	CAS Number			
	HYPOCHLORITE SOLUTION		2 x 1000 L IBCs	UN Number	1791	Pack Group	III	Physical State	Liquid	pH	Alkali
SOHYCL1813	Sodium Hypochlorite 12.5% 1000L Returnable IBC	2599840: D (Reject)	3 KLTR	Poison Sch.	6	Hazchem	2X	CAS Number			
	HYPOCHLORITE SOLUTION	3050784: D (Reject)	3 x 1000 L IBCs	UN Number	1791	Pack Group	III	Physical State	Liquid	pH	Alkali
SOHYCL1813	Sodium Hypochlorite 12.5% 1000L Returnable IBC	3812289: D	26 KLTR	Poison Sch.	6	Hazchem	2X	CAS Number			
	HYPOCHLORITE SOLUTION	3814151: D	26 x 1000 L IBCs	UN Number	1791	Pack Group	III	Physical State	Liquid	pH	Alkali
SOHYCL1832	SODIUM HYPOCHLORITE 12.5% 200L Drums	2355783: D (Reject)	2.6 KLTR	Poison Sch.	6	Hazchem	2X	CAS Number			
	Non Returnable	3104924: D (Reject)	13 x 200 L drums	UN Number	1791	Pack Group	III	Physical State	Liquid	pH	Alkali
SONITL1803	SODIUM NITRITE 40% w/w	936932: T (Reject)	600 L	Poison Sch.	6	Hazchem	2W	CAS Number			
	OXIDIZING LIQUID, TOXIC, N.O.S. (Sodium Nitrite 40% Solution)		3 x 200 L drums	UN Number	3099	Pack Group	III	Physical State	Liquid	pH	Alkali
SONITR9100	Sodium Nitrite - No Anticaking	3097601: T	2.3 tonne	Poison Sch.	7	Hazchem	1Z	CAS Number			
	SODIUM NITRITE		92 x 25 kg bags	UN Number	1500	Pack Group	III	Physical State	Solid	pH	Alkali
TOLYLI1200	Tolyltriazole 50% Sodium Salt	2687800: D (Reject)	2.399999 tonne	Poison Sch.	N/A	Hazchem	2X	CAS Number			
	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (Tolyltriazole, Sodium Salt)		1.999999 x 1200 kg IBCs	UN Number	3267	Pack Group	III	Physical State	Liquid	pH	Alkali
				Poison Sch.		Hazchem		CAS Number	64665-57-2		
									C, Xn		

Dangerous Goods Stock Manifest

Stock by Building

Building Rear Warehouse / ACACID1830 to
GLUTER4501

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACACID1830	ACETIC ACID 45% 25kg Carboys	3139742: G	0.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass		8 x 25 kg carboys	UN Number	2790	Pack Group	III	CAS Number	64-19-7		
ACACID1831	ACETIC ACID 20% 200kg Drums	2955808: G	1.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass		6 x 200 kg drums	UN Number	2790	Pack Group	III	CAS Number	64-19-7		
ACACID1863	ACETIC ACID GLACIAL 200kg Drums	3166120A: G 3166120B: G	6 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
	ACETIC ACID, GLACIAL		30 x 200 kg drums	UN Number	2789	Pack Group	II	CAS Number	64-19-7		
ACACID7500	Acetic Acid 75% - Blue Drums	3031110: G 3218784B: G	17.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass		86 x 200 kg drums	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
FECHLO1812	FERRIC CHLORIDE 42% 290KG Drums	945071: G	0.87 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	FERRIC CHLORIDE SOLUTION		3 x 290 kg drums	UN Number	2582	Pack Group	III	CAS Number	7705-08-0		
FECHSO2505	Ferric Chloride 42% Solution	3222690: G 3225287: G 3233825: G	123.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	FERRIC CHLORIDE SOLUTION		88 x 1400 kg IBCs	UN Number	2582	Pack Group	III	CAS Number	7705-08-0		
FECHSO2700	Ferric Chloride 42% Solution	2738242: G (Reject) 3117535: G (Reject)	13.051 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	FERRIC CHLORIDE SOLUTION		13051 x 1 kg bulk	UN Number	2582	Pack Group	III	CAS Number	7705-08-0		
FORMAL1100	Formaldehyde 37/7 IBC	2576412: G (Reject)	2.2 tonne	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
	FORMALDEHYDE SOLUTION with not less than 25% formaldehyde		2 x 1100 kg IBCs	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
FORMAL1817	Formalin 37/7 1000kg IBC	2195809: G (Reject)	0.4 tonne	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
	FORMALDEHYDE SOLUTION with not less than 25% formaldehyde		0.4 x 1000 kg IBCs	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
GLUTER4500	Glutaraldehyde 50%	3132437A: G	2.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (GLUTARALDEHYDE 50%)		2 x 1100 kg IBCs	UN Number	3265	Pack Group	II	CAS Number	111-30-8		
GLUTER4501	Glutaraldehyde 50%	3132437B: G	2.64 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (GLUTARALDEHYDE 50%)		12 x 220 kg drums	UN Number	3265	Pack Group	II	CAS Number	111-30-8		

Dangerous Goods Stock Manifest

Stock by Building

Building Rear Warehouse / HYACIB1900 to PHACID0900

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
HYACIB1900	Hydrochloric Acid 33% 1170Kg IBC (One-Way) HYDROCHLORIC ACID	2977952: G 3164021: G 3211943: G	62.01 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			53 x 1170 kg IBCs	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C		
HYACIB1900	Hydrochloric Acid 33% 1170Kg IBC (One-Way) HYDROCHLORIC ACID	3211943: G (Reject)	16.38 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			14 x 1170 kg IBCs	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C		
HYACIB2500	Hydrochloric Acid 33% HYDROCHLORIC ACID	3066165: G (Reject)	3.48 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			3 x 1160 kg IBCs	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C		
HYACIB9602	Hydrochloric Acid 35% IBC HYDROCHLORIC ACID	3200990: G	45.6 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			40 x 1140 kg IBCs	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C		
HYACID1847	HYDROCHLORIC ACID 9% 20L Carboys HYDROCHLORIC ACID	3024610: G	0.04 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 20 L carboys	UN Number Poison Sch.	1789 5	Pack Group Hazchem	III 2R	CAS Number	7647-01-0 C		
HYACID1900	Hydrochloric Acid 33%, 240 kg Drums HYDROCHLORIC ACID	3010383: G (Reject)	0.24 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			1 x 240 kg drums	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C		
NIACID6500	Nitric Acid 68% 280kg NITRIC ACID other than red fuming, with at least 65% but not more than 70% nitric acid	3009673: G (Reject)	0.28 tonne	Class	8	Sub. Risk(s)	5.1	Physical State	Liquid	pH	Acid
			1 x 280 kg drums	UN Number Poison Sch.	2031 6	Pack Group Hazchem	II 2R	CAS Number	7697-37-2 O, C		
PHACID0100	Phosphoric Acid 85% Food 35kg Carboys PHOSPHORIC ACID, SOLUTION	45CX1510050: G 45CX1605029: G	8.54 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			244 x 35 kg carboys	UN Number Poison Sch.	1805 6	Pack Group Hazchem	III 2R	CAS Number	7664-38-2 C		
PHACID0900	Phosphoric Acid 85% FCC 1700kg One-Way IBC PHOSPHORIC ACID, SOLUTION	45CX1606040: G	3.4 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 1700 kg IBCs	UN Number Poison Sch.	1805 6	Pack Group Hazchem	III 2R	CAS Number	7664-38-2 C		
PHACID0900	Phosphoric Acid 85% FCC 1700kg One-Way IBC PHOSPHORIC ACID, SOLUTION	45CX1606040: G	1.7 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			1 x 1700 kg IBCs	UN Number Poison Sch.	1805 6	Pack Group Hazchem	III 2R	CAS Number	7664-38-2 C		

Dangerous Goods Stock Manifest

Stock by Building

Building Rear Warehouse / PHACID8602 to
SULACI1842

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
PHACID8602	Phosphoric Acid 75% Food 1550kg PHOSPHORIC ACID, SOLUTION	45CX1604028: G	55.8 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			36 x 1550 kg IBCs	UN Number Poison Sch.	1805 6	Pack Group Hazchem	III 2R	CAS Number	7664-38-2 C		
PHACID8705	Phosphoric Acid 81% FCC 1650Kg PHOSPHORIC ACID, SOLUTION	45CX1605032: G	3.3 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 1650 kg IBCs	UN Number Poison Sch.	1805 6	Pack Group Hazchem	III 2R	CAS Number	7664-38-2 C		
SULACB5000	Sulphuric Acid 98% Bulk SULPHURIC ACID with more than 51% acid	L151094: G (Reject)	0.49 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			490 x 1 kg bulk	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1743	SULPHURIC ACID 98% 1000L Nylex Returnable IBC SULPHURIC ACID with more than 51% acid	3817242: G	3 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			3 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1835	SULPHURIC ACID 98% 200L Drums SULPHURIC ACID with more than 51% acid	3236720: G	2.8 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			14 x 200 L drums	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1842	SULPHURIC ACID 98% 1000L One-way IBCs SULPHURIC ACID with more than 51% acid	3817305: G	5 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			5 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1842	SULPHURIC ACID 98% 1000L One-way IBCs SULPHURIC ACID with more than 51% acid	2899618: G (Reject)	0.186 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.186 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		

Dangerous Goods Stock Manifest

Stock by Building

Building Sample / CAUSOD1843 to SULACI1917

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

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Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CAUSOD1843	Caustic Soda Liquid 30% 1000L IBC (One-Way) SODIUM HYDROXIDE SOLUTION	2493817: Sample (Sample) 2810564: Sample (Sample)	0.00025 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.00025 x 1000 L IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOD1852	Caustic Soda Liquid 50% 20L Carboys SODIUM HYDROXIDE SOLUTION	2271338: Sample (Sample)	0.000145 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.00725 x 20 L carboys	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
HYACID1834	HYDROCHLORIC ACID 33%, 20 litre carboys (One-Way) HYDROCHLORIC ACID	2382132: Sample (Sample)	0.000205 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.01025 x 20 L carboys	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C		
SOCHIT1811	SODIUM CHLORITE 7.5% 20L Carboys CHLORITE SOLUTION	2509197: Sample (Sample)	0.060318 L	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.003015 x 20 L carboys	UN Number Poison Sch.	1908 5	Pack Group Hazchem	III 2X	CAS Number	7758-19-2 C		
SOPERC4400	Sodium Percarbonate Coated SODIUM CARBONATE PEROXYHYDRATE	154822: Sample (Sample)	0.0001 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
			0.004 x 25 kg bags	UN Number Poison Sch.	3378 6	Pack Group Hazchem	II 1Y	CAS Number	15630-89-4 O, Xn, Xi		
SULACI1832	SULPHURIC ACID 98% 10L Carboy SULPHURIC ACID with more than 51% acid	2837015: Sample (Sample)	0.000019 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.0019 x 10 L carboys	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1917	SULPHURIC ACID 70% 200L Drums SULPHURIC ACID with more than 51% acid	2732415: Sample (Sample)	0.000591 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.002955 x 200 L drums	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		

Dangerous Goods Stock Manifest

Stock by Building

Building Waste Treatment / CAUSOD1857 to
NIACID9300

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

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Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CAUSOD1857	Caustic Soda Liquid 50% 1530kg IBC (Returnable) SODIUM HYDROXIDE SOLUTION	2240985: W (IBCs) (Manufacturing)	1.53 tonne 1 x 1530 kg IBCs	Class UN Number Poison Sch.	8 1824 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2R	Physical State CAS Number	Liquid 1310-73-2 C	pH	Conc. Str. Alkali
EFFLUE3000	Effluent Waste Water Weak Alkali (IBC) CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	N/A: W (IBCs) (Manufacturing)	3 KLTR 3 x 1000 L IBCs	Class UN Number Poison Sch.	8 3266 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid	pH	Alkali
EFFLUE4000	Effluent Waste Water Concentrated Alkali (IBC) CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	N/A: W (IBCs) (Manufacturing)	9 KLTR 9 x 1000 L IBCs	Class UN Number Poison Sch.	8 3266 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid	pH	Conc. Str. Alkali
EFFLUE4500	Effluent Waste Water Concentrated Alkali (Bulk/AGT) CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	N/A: W (AGT) (Manufacturing)	10 KLTR 10000 x 1 L bulk	Class UN Number Poison Sch.	8 3266 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid	pH	Conc. Str. Alkali
EFFLUE6000	Effluent Waste Water Concentrated Acid (IBC) CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	N/A: W (IBCs) (Manufacturing)	15 KLTR 15 x 1000 L IBCs	Class UN Number Poison Sch.	8 3264 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid	pH	Conc. Str. Acid
NIACID9300	Nitric Acid 68% Min NITRIC ACID other than red fuming, with at least 65% but not more than 70% nitric acid	146588B: W (IBCs) (Manufacturing)	0.28 tonne 1 x 280 kg drums	Class UN Number Poison Sch.	8 2031 6	Sub. Risk(s) Pack Group Hazchem	5.1 II 2R	Physical State CAS Number	Liquid 7697-37-2 O, C	pH	Acid

**NOISE IMPACT ASSESSEMENT
PREPARED FOR
DEVELOPMENT OF STAGE 4 OF REDOX PTY LTD
MINTO, NSW**

Prepared for: Malcolm Perrins
Redox Pty Ltd

Prepared by: R T Benbow, Principal Consultant

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Contents	Page
1. INTRODUCTION	1
1.1 Scope of Works	1
2. NEAREST SENSITIVE RECEPTORS	2
3. EXISTING ACOUSTIC ENVIRONMENT	4
3.1 Noise Monitoring Equipment and Methodology	4
3.2 Measurement Location	4
3.3 Measured Noise Levels	5
3.3.1 Long-Term Unattended Noise Monitoring Results	5
3.4 Photographs	9
4. CURRENT LEGISLATION AND GUIDELINES	11
4.1 NSW EPA Industrial Noise Policy	11
4.1.1 Introduction	11
4.1.2 Intrusiveness Criterion	11
4.1.3 Amenity Criterion	11
4.1.4 Operational Project Specific Noise Levels	13
4.2 NSW EPA Road Noise Policy	15
4.2.1 Introduction	15
4.2.2 Proposed Truck Routes	16
4.2.3 Road Category	16
4.2.4 Noise Assessment Criteria	17
4.2.5 Relative Increase Criteria	17
4.2.6 Exceedance of Criteria	18
4.2.7 Assessment Locations for Existing Land Uses	19
4.2.8 Road Traffic Project Specific Noise Levels	20
5. NOISE IMPACT ASSESSMENT	21
5.1 Hours of Operations	21
5.2 Noise Sources	21
5.3 Modelling Methodology	23
5.3.1 Noise Model	23
5.3.2 Assumptions Made for Noise Modelling	23
5.3.3 Noise Modelling Scenarios	25
5.3.4 Meteorological Factors	25
5.4 Operational Predicted Noise Levels	26
5.5 Road Traffic Predicted Noise Levels	28
6. STATEMENT OF POTENTIAL NOISE IMPACT	29
7. LIMITATIONS	30

Tables	Page
Table 2-1: Nearest Identified Sensitive Receptors	2
Table 3-1: Unattended Noise Monitoring Results at Receptor R2, dB(A)	6
Table 3-2: Unattended Noise Monitoring Results at Receptor R4, dB(A)	7
Table 3-3: Unattended Noise Monitoring Results at Receptor R9, dB(A)	8
Table 4-1: NSW EPA Amenity Criteria - Recommended L_{Aeq} noise levels from industrial noise sources	12
Table 4-2: Modification to Acceptable Noise Level (ANL ¹) to Account for Existing Levels of Stationary Noise	12
Table 4-3: Current Project Specific Noise Levels Associated with Operational Activities, dB(A)	14
Table 4-4: Adopted Project Specific Noise Levels Associated with Operational Activities, dB(A)	15
Table 4-5: Road Traffic Noise Assessment Criteria For Residential Land Uses, dB(A)	17
Table 4-6: Relative Increase Criteria For Residential Land Uses, dB(A)	18
Table 4-7: Assessment Locations for Existing Land Uses	19
Table 4-8: Existing Traffic Flow Unrelated to Redox Operations between 7am and 10pm	20
Table 4-9: Project Specific Noise Levels Associated with Road Traffic for the Day Time Period , dB(A)	20
Table 5-1: A-weighted Sound Power Levels Associated with Operational Activities, dB(A)	22
Table 5-2: Traffic Flow Related to Redox Operations	24
Table 5-3: Modelled Noise Scenario for Proposed Operations	25
Table 5-4: Meteorological Conditions Assessed in Noise Propagation Modelling	25
Table 5-5: Noise Modelling Results, dB(A) – $L_{eq, 15 \text{ minute}}$	26
Table 5-6: Predicted Noise Levels Associated with Road Traffic, dB(A)	28

Figures	Page
Figure 2-1: Noise Monitoring Locations and Nearest Sensitive Receptors	3
Figure 3-1: Receptor R2	9
Figure 3-2: Receptor R4	10
Figure 3-3: Receptor R9	10
Figure 4-1: Proposed Truck Routes	16

Attachments

- Attachment 1: Noise Terminology
- Attachment 2: QA/QC Procedures
- Attachment 3: Calibration Certificates
- Attachment 4: Daily Noise Logger Charts





1. INTRODUCTION

Benbow Environmental has been engaged by Redox Pty Ltd to undertake a noise impact assessment for additions to the existing Redox premises located at 2 Swettenham Road, Minto. In particular, this report details the findings of operational and road traffic noise impacts from the proposed operations.

The development was approved as a 4 stage project and stages 1, 2 and 3 have been completed. This new application is for Stage 4, with a request to modify the consent conditions for changes to types of chemicals to be stored and decanted and to modify heavy vehicle access routes.

An Environmental Impact Statement (EIS) was prepared by Dick Benbow & Associates Pty Limited in 2001 (Ref. 11106).

A traffic and parking impact assessment was prepared by Transport & Urban Planning Pty Ltd in March 2015 for the proposed changes of the current truck routes as a result of new road developments in the area (Ref. 14228r).

Relevant information associated with the noise impact assessment contained in the previous EIS and the current traffic and parking impact assessment has been utilized in the current noise impact assessment.

The site is located within an industrial area. Nearest sensitive residential receptors were noted as being approximately 200 metres east of the site boundary. Noise predictions were undertaken utilising noise prediction software, Sound Plan (v7.3).

This noise survey has been prepared in accordance with the following guidelines:

- *NSW Environment Protection Authority, Industrial Noise Policy (EPA 2000) (INP); and*
- *Department of Environment, Climate Change and Water NSW, Road Noise Policy (DECCW 2011) (RNP).*

1.1 SCOPE OF WORKS

This noise impact assessment has been limited to the following scope of works:

- a) Inspection of site and surrounds, and review of previous Environmental Impact Statement;
- b) Long term noise monitoring and short term noise monitoring in accordance with the relevant NSW EPA guidelines;
- c) Re-establishment of project specific noise levels;
- d) Determination of all potential noise sources associated with the operations at the subject site;
- e) Collection of required noise samples;
- f) Prediction of potential noise impacts at the nearby noise sensitive receptors;
- g) Assessment of potential noise impacts against relevant legislation and guidelines;
- h) Investigate ameliorative measures/control solutions (where required); and
- i) The compilation of this report containing concise statements of potential noise impact.

To aid in the review of this report, supporting documentation has been included within the Attachments.



2. NEAREST SENSITIVE RECEPTORS

Table 2-1 provides the list of the nearest identified sensitive receptors that could be potentially affected by the noise impacts from the site's activities. These receptors were selected based on their proximity and directional bearing from the subject site. Special attention has been given to residential receptors located along proposed heavy vehicle routes. Given the distance between the site and the residential receptors, the potential for operational noise impacts to the surrounding residential area is unlikely. However, the noise impacts were evaluated with due diligence.

Receptors R1 to R13 have been considered to assess the operational noise impact whilst receptors R3, R5, R6, R7, R8 and R9 have been considered to also assess the road traffic noise impact.

The locations of all these receptors are shown in an aerial photograph provided as Figure 2-1.

Table 2-1: Nearest Identified Sensitive Receptors

Receptor	Equivalent Locations in EIS 11106	Address	Coordinates	
			Easting (m)	Northing (m)
Residential Receptors				
R1	Loc B	32 Minto Road, Minto	300923.2	6232936.897
R2	-	14 Stafford Street Minto	301094.8	6232822.981
R3	Loc D	26 Galloway Crescent, St Andrews	299917.5	6232845.247
R4	-	5 Carstairs Place, St Andrews	299848.8	6232873.02
R5	-	6 Coll Place, St Andrews	299791.2	6232543.782
R6	-	18 Hebrides Place, St Andrews	299701.5	6232366.269
R7	-	10 Arran Place, St Andrews	299302.	6232405.647
R8	-	8 Troon Place, St Andrews	299598.9	6232099.19
R9	Loc E	67 Stromeferry Crescent, St Andrews	299241.6	6231939.057
R10	Loc C	23 Harding Place, Minto	301225.3	6232089.157
School				
R11	Loc F	20 Swettenham Road, Minto	300095.165	6232704.981
Industrial Receptors				
R12	-	13 Montore Road, Minto	300105.644	6232402.935
R13	-	20 Swettenham Road, Minto	299965.708	6232505.291

Figure 2-1: Noise Monitoring Locations and Nearest Sensitive Receptors



3. EXISTING ACOUSTIC ENVIRONMENT

The level of background noise varies over the course of any 24 hour period, typically from a minimum at 3.00am to a maximum during morning and afternoon traffic peak hours. Therefore the INP requires that the level of background and ambient noise be assessed separately for the daytime, evening and night time periods. The INP defines these periods as follows:

- **Day** is defined as 7.00am to 6.00pm, Monday to Saturday and 8.00am to 6.00pm Sundays and Public Holidays;
- **Evening** is defined as 6.00pm to 10.00pm, Monday to Sunday and Public Holidays; and
- **Night** is defined as 10.00pm to 7.00am, Monday to Saturday and 10.00pm to 8.00am Sundays and Public Holidays.

3.1 NOISE MONITORING EQUIPMENT AND METHODOLOGY

The existing ambient and background noise environment was measured using a Svantek SVAN 957 Precision Sound Level Meter (attended noise monitoring) and three (3) Acoustic Research Laboratories statistical Environmental Noise Loggers, type Ngara and EL-215 (unattended noise monitoring). The approach adopted is consistent with the requirements of the NSW EPA INP.

The instrument sets were calibrated by a NATA accredited laboratory within two years of the measurement period. Calibration certificates have been included in the Attachments.

To ensure accuracy and reliability in the results, field reference checks were applied both before and after the measurement period with an acoustic calibrator. There were no excessive variances observed in the reference signal between the pre-measurement and post-measurement calibration. The instruments were set on A-weighted Fast response and noise levels were measured over 15-minute statistical intervals. QA/QC procedures applied for the measurement and analysis of noise levels have been presented in Attachment 2. The microphones were fitted with windsocks and were positioned at 1.5 meters above ground level.

In assessing the background noise levels, any data affected by adverse weather conditions has been discarded according to the requirements of the INP. The weather data was sourced from the Bureau of Meteorology, from the Automatic Weather Station (AWS) located at Campbelltown (ID 068257).

3.2 MEASUREMENT LOCATION

Unattended long-term noise monitoring was undertaken from Friday 20th February 2015 to Wednesday 4th March 2015 at receptors R2, R4 and R9. These monitoring locations have been strategically selected to compare previous background noise readings undertaken in 2001. The measured noise levels have been considered as being representative of the existing background noise environment of the area in the absence of existing site emissions as current site noise emissions at these locations was inaudible. This methodology has been adopted in accordance with the requirements included in Appendix B of the Industrial Noise Policy Application Notes.



Ambient noise levels associated with current road traffic flows was not carried out as all houses along the proposed heavy vehicle routes presented a 1.8 m high colorbond fence between the residence and the respective road. The placement of a noise logger behind the fence would not allow measurements of representative ambient noise levels at the upper levels of the house. Therefore, a more adequate methodology based on noise modelling was utilized.

3.3 MEASURED NOISE LEVELS

3.3.1 Long-Term Unattended Noise Monitoring Results

The measured data obtained from receptors R2, R4 and R9 was analysed to determine a single assessment background level (ABL) for each day, evening and night time period, in accordance with the INP. That is, the ABL is best established by determining the lowest tenth-percentile level of the L_{A90} noise data over each period of interest. The background noise level or rating background level (RBL) representing the day, evening and night assessment periods is based on the median of individual ABL's determined over the entire monitoring period.

The results of the long-term unattended noise monitoring are displayed in Table 3-1, Table 3-2 and Table 3-3.

Daily noise logger graphs have been included in the Attachments.



Table 3-1: Unattended Noise Monitoring Results at Receptor R2, dB(A)

Date	Average L ₁			Average L ₁₀			ABL (L ₉₀)			L _{eq}		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
20/02/2015	64	61	-	53	55	-	42	42	-	52	55	-
21/02/2015	62	60	-	51	52	-	37	39	-	51	51	-
22/02/2015	-	63	-	-	56	-	-	41	-	-	59	-
23/02/2015	63	61	59	52	56	57	37	42	42	52	57	56
24/02/2015	63	62	58	54	54	55	39	44	42	54	53	56
25/02/2015	-	61	56	-	56	52	-	41	39	-	55	52
26/02/2015	65	-	-	54	-	-	37	-	-	56	-	-
27/02/2015	65	62	57	55	55	51	39	43	43	56	54	50
28/02/2015	63	59	54	53	53	50	38	42	41	55	53	49
1/03/2015	60	59	52	50	52	47	37	43	41	50	51	47
2/03/2015	-	-	-	-	-	-	-	-	-	-	-	-
3/03/2015	63	61	52	52	55	48	38	42	36	52	54	49
4/03/2015	66	-	53	57	-	51	37	-	41	X	-	50
Average	63	61	55	53	54	51	*	*	*	*	*	*
Median (RBL)	*	*	*	*	*	*	38	42	41	*	*	*
Logarithmic Average	*	*	*	*	*	*	*	*	*	66	55	52

Note: - indicates values that has not been considered due to adverse weather conditions
X – indicates extraneous noise event affected measurement – anomaly in noise levels trend observed
indicates noise measurements were not undertaken during this period
* Indicates values that are not relevant to that noise descriptor
Value in bold indicates most relevant noise descriptor



Table 3-2: Unattended Noise Monitoring Results at Receptor R4, dB(A)

Date	Average L ₁			Average L ₁₀			ABL (L ₉₀)			L _{eq}		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
20/02/2015	74	62	-	65	54	-	46	44	-	65	55	-
21/02/2015	57	56	-	50	49	-	39	41	-	53	51	-
22/02/2015	-	60	-	-	49	-	-	39	-	-	53	-
23/02/2015	56	64	55	51	62	50	39	56	38	53	61	56
24/02/2015	59	63	61	55	58	59	50	51	50	54	56	58
25/02/2015	-	X	66	-	X	X	-	45	47	-	X	X
26/02/2015	X	-	-	X	-	-	46	-	-	X	-	-
27/02/2015	82	71	64	76	65	59	58	55	54	X	63	57
28/02/2015	65	65	66	61	60	61	54	54	55	59	58	60
1/03/2015	68	68	65	62	62	60	54	54	53	61	59	59
2/03/2015	-	-	-	-	-	-	-	-	-	-	-	-
3/03/2015	65	64	61	59	60	57	53	57	53	58	59	56
4/03/2015	64	#	62	60	#	58	56	#	55	58	#	57
Average	67	67	63	61	60	58	*	*	*	*	*	*
Median (RBL)	*	*	*	*	*	*	51	52	53	*	*	*
Logarithmic Average	*	*	*	*	*	*	*	*	*	60	59	58

Note:
 - indicates values that has not been considered due to adverse weather conditions
 X – indicates extraneous noise event affected measurement – anomaly in noise levels trend observed
 # indicates noise measurements were not undertaken during this period
 * Indicates values that are not relevant to that noise descriptor
 Value in bold indicates most relevant noise descriptor



Table 3-3: Unattended Noise Monitoring Results at Receptor R9, dB(A)

Date	Average L ₁			Average L ₁₀			ABL (L ₉₀)			L _{eq}		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
20/02/2015	63	63	-	55	55	-	46	46	-	53	53	-
21/02/2015	63	63	-	53	54	-	42	42	-	53	54	-
22/02/2015	-	62	-	-	52	-	-	44	-	-	52	-
23/02/2015	64	62	55	55	53	52	45	46	40	54	53	51
24/02/2015	64	62	55	54	52	50	44	44	42	53	52	49
25/02/2015	-	62	55	-	52	49	-	43	39	-	52	49
26/02/2015	63	-	-	55	-	-	44	-	-	54	-	-
27/02/2015	64	63	59	54	55	53	43	46	47	53	54	52
28/02/2015	63	64	56	53	55	51	43	45	43	52	X	51
1/03/2015	62	62	55	53	54	50	43	46	44	54	53	51
2/03/2015	-	-	-	-	-	-	-	-	-	-	-	-
3/03/2015	63	#	55	54	#	50	44	#	42	53	#	49
Average	63	62	56	54	53	51	*	*	*	*	*	*
Median (RBL)	*	*	*	*	*	*	44	45	42	*	*	*
Logarithmic Average	*	*	*	*	*	*	*	*	*	53	53	51

Note:

- indicates values that has not been considered due to adverse weather conditions
- X – indicates extraneous noise event affected measurement – anomaly in noise levels trend observed
- # indicates noise measurements were not undertaken during this period
- * Indicates values that are not relevant to that noise descriptor
- Value in bold indicates most relevant noise descriptor

In general terms, the background noise levels measured during 2015 were significantly higher compared to the noise readings undertaken in 2001. This could be attributed to the increase of traffic over the years as the attended noise monitoring undertaken in 2015 indicated that traffic is the primary noise contributor in the area.

3.4 PHOTOGRAPHS

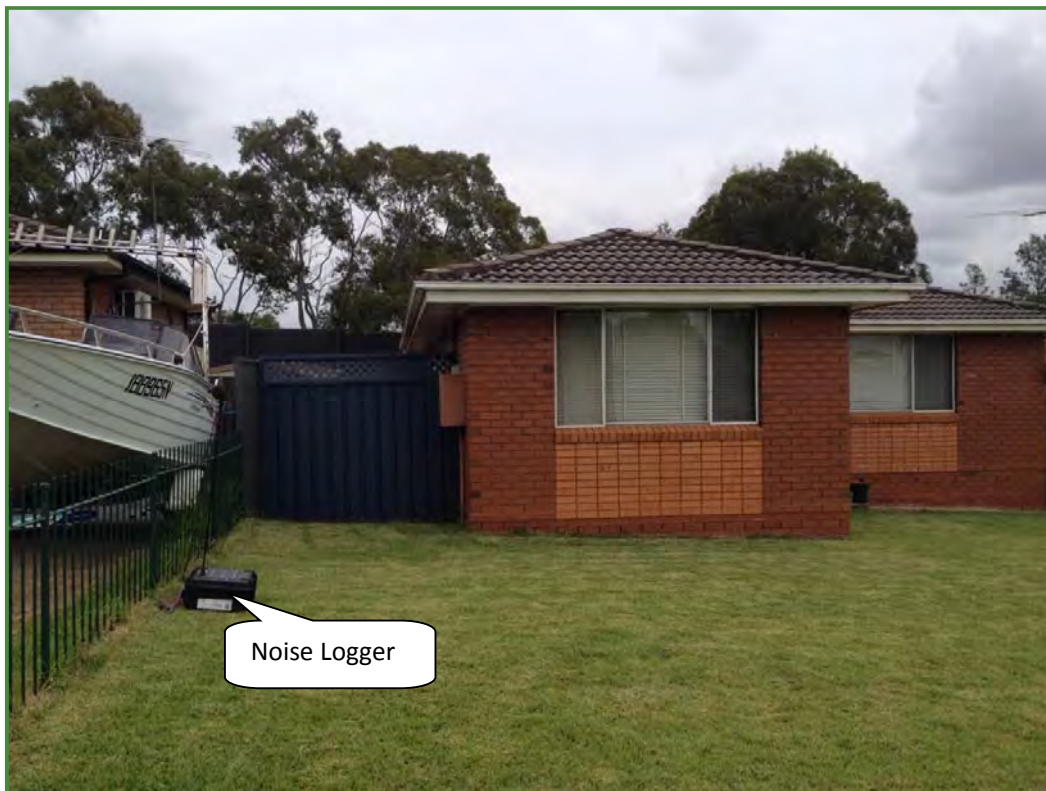
Figure 3-1: Receptor R2



Figure 3-2: Receptor R4



Figure 3-3: Receptor R9



4. CURRENT LEGISLATION AND GUIDELINES

4.1 NSW EPA INDUSTRIAL NOISE POLICY

4.1.1 Introduction

The NSW INP was developed by the NSW EPA primarily for the assessment of noise emissions from industrial sites regulated by the NSW EPA. However, the policy can also be used by NSW Planning and Infrastructure and local government to assist in their assessment of potential noise issues.

An important point to note in the policy is presented in Section 1.4.1. This section states:

“The industrial noise source criteria set down in Section 2 are best regarded as planning tools. They are not mandatory, and an application for a noise-producing development is not determined purely on the basis of compliance or otherwise with the noise criteria. Numerous other factors need to be taken into account in the determination. These factors include economic consequences, other environmental effects and the social worth of the development.”

The policy sets out two criteria that are used to assess potential site-related noise impacts. The first criterion aims at controlling intrusive noise impacts in the short-term for residences. This criterion is therefore called the intrusiveness criterion.

The second criterion aims at maintaining a suitable amenity for particular land uses including residences in the long-term. This criterion is called the amenity criterion.

4.1.2 Intrusiveness Criterion

The intrusiveness criterion can be summarised as:

$$L_{Aeq,(15\text{minute})} \leq \text{rating background level} + 5 \text{ dB(A)}$$

The $L_{Aeq,(15\text{minute})}$ is the predicted or measured L_{Aeq} from noise generated within the Project Site over a fifteen minute interval at the receptor.

The ‘Shoulder Period’ intrusiveness criterion can be summarised as above, where the rating background level is based on a linear average of the daytime and night-time rating background levels.

This is to be assessed at the most affected point on or within the residential property boundary or if that is more than 30 m from the residence, at the most affected point within 30 m of the residence.

4.1.3 Amenity Criterion

To limit continuing increases in noise levels, the maximum ambient noise level within an area from industrial noise sources should not normally exceed the acceptable noise levels specified in Table 2.1 of the INP, the applicable parts of which are reproduced in Table 4-1.

Table 4-1: NSW EPA Amenity Criteria - Recommended L_{Aeq} noise levels from industrial noise sources

Type of Receptor	Indicative Noise Amenity Area	Period	Recommended L_{Aeq} noise level (dB(A))	
			Acceptable	Recommended Maximum
Residence	Suburban	Day	55	60
		Evening	45	50
		Night	40	45
Residence	Urban	Day	60	65
		Evening	50	55
		Night	45	50
School classroom-internal	All	Noisiest 1-hour period when in use	35 (internal) 45 (external)*	40 (internal) 50 (external)*
Industrial premises	All	When in use	70	75

Note: * a difference of 10dB between outside and inside has been considered

The existing industrial noise levels are compared to the acceptable level and Table 4-2 is then used to derive the applicable amenity criteria.

Table 4-2: Modification to Acceptable Noise Level (ANL¹) to Account for Existing Levels of Stationary Noise

Total Existing L_{Aeq} Noise Level From Industrial Sources	Maximum L_{Aeq} Noise Level for Noise from New Sources Alone
$\geq ANL + 2$	If existing noise level is likely to decrease in future: ANL – 10 If existing noise level is unlikely to decrease in the future: Existing level – 10
ANL + 1	ANL – 8
ANL	ANL – 8
ANL – 1	ANL – 6
ANL – 2	ANL – 4
ANL – 3	ANL – 3
ANL – 4	ANL – 2
ANL – 5	ANL – 2
ANL – 6	ANL – 1
< ANL – 6	ANL

Source: Table 2.2 NSW EPA INP

Note: ¹ANL is the recommended acceptable L_{Aeq} noise level for the specific receptor, area and time of day.



4.1.4 Operational Project Specific Noise Levels

Noise limits for the subject Site can be established in accordance with the principles and methodologies of the INP, the measured background noise levels and the existing industrial operational noise levels of the area.

According to the INP, it is recommended that the more stringent noise limits be applied to protect the existing acoustic amenity from deteriorating.

The current project specific noise levels associated with operational noise are presented in Table 4-3.

It should be noted that for schools the noisiest 1-hour time period should be applied when assessing the project specific noise level at school classrooms. However, in order to ensure compliance under all circumstances, a 15 minute period assessment has been considered.

When the RBL for evening or night time is found to be higher than the daytime RBL, this is set to daytime in accordance with the NSW EPA INP requirements.



Table 4-3: Current Project Specific Noise Levels Associated with Operational Activities, dB(A)

Receptor	Associated Monitoring Receptor	Time Period	Measured RBL L90	Existing Industrial Noise L_{eq}	Acceptable Noise Level L_{eq}	Intrusive Criterion $L_{eq,15minute}$	Amenity Criterion $L_{eq, period}$	Current PSNL $L_{eq,15 minute}$
Residential Receptors								
R1, R2, R10	R2	Day	38	Inaudible	55	43	55	43
		Evening	38	Inaudible	45	43	45	43
		Night	38	Inaudible	40	43	40	42**
R3, R4, R5, R6, R8	R4	Day	51	Inaudible	60	56	60	56
		Evening	51	Inaudible	50	56	50	52**
		Night	51	Inaudible	45	56	45	47**
R7, R9	R9	Day	44	Inaudible	60	49	60	49
		Evening	44 ¹	Inaudible	50	49	50	49
		Night	42	Inaudible	45	47	45	47**
School								
R11	-	When in use	-	-	45*	-	45*	45
Industrial Receptors								
R12, R13	-	When in use	-	-	70	-	70	70

Note: - indicates not applicable
 * Indicates external noise level
 ** The $L_{eq,period}$ has been considered to be equal to $L_{eq,15 \text{ min}}$ minus 2dB



The site currently operates against approved PSNL established during the previous noise impact assessment in 2001. These approved PSNL have been compared with current PSNL established during this noise survey. As a conservative approach, the lowest values have been adopted as the PSNL for the cumulative impact of current and proposed operations at the subject site. Table 4-4 shows the adopted PSNL.

Table 4-4: Adopted Project Specific Noise Levels Associated with Operational Activities, dB(A)

Receptor	Period	Approved PSNL L _{eq} , 15 minute	Current PSNL L _{eq} , 15 minute	Adopted PSNL L _{eq} , 15 minute
Residential Receptors				
R1, R2, R10	Day	46	43	43
	Evening	-	43	43
	Night	-	42	42
R3, R4, R5, R6, R8	Day	46	56	46
	Evening	-	52	46
	Night	-	47	46
R7, R9	Day	46	49	46
	Evening	-	49	46
	Night	-	47	46
School				
R11	When in use	45	45	45
Industrial Receptors				
R12, R13	When in use	70	70	70

4.2 NSW EPA ROAD NOISE POLICY

4.2.1 Introduction

The RNP has been adopted by the EPA to establish the off-site road traffic noise criteria for the potential noise impact associated with the facility. The RNP was developed by the NSW EPA primarily to identify the strategies that address the issue of road traffic noise from:

- Existing roads;
- New road projects;
- Road redevelopment projects; and
- New traffic-generating developments.

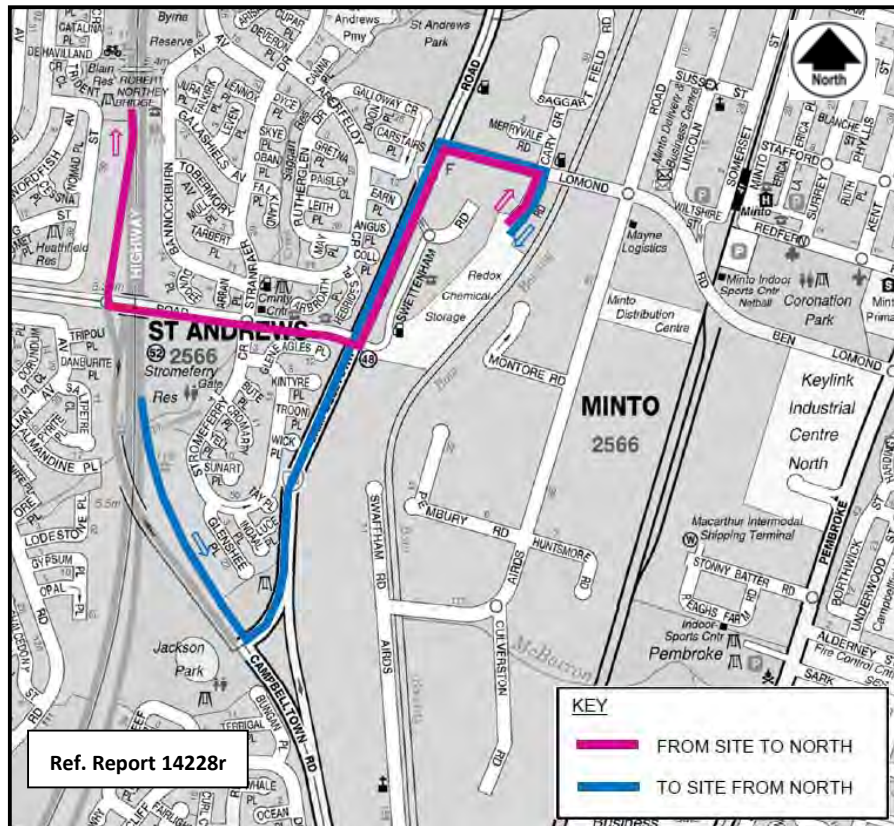
The RNP also defines criteria to be used in assessing the impacts of such noise.

4.2.2 Proposed Truck Routes

The new truck routes that would use the new M31 on-ramp are detailed below:

- From site to north: Holmes Road, left onto Ben Lomond Road, left onto Campbelltown Road, right onto Raby Road, right onto M31 on ramp.
- To site from north: M31 off ramp, left onto Campbelltown Road, right onto Ben Lomond Road, right onto Holmes Road.

Figure 4-1: Proposed Truck Routes



4.2.3 Road Category

The RNP states the following:

“Roads are functionally classified by a range of factors, including their role in facilitating traffic movement; their relationship to other road categories; and whether they support through or local traffic, access to adjacent land uses and applicable traffic management options”.

Campbelltown Road, Raby Road and M31 Motorway have been considered as the roads most affected by site road traffic noise. Campbelltown Road and Raby Road are classified as ‘Sub-arterial roads’ whilst M31 Motorway as ‘Freeway or motorway/arterial roads’ as defined in the RNP.

The functional role of a ‘Sub-arterial road’ is explained as follows:

- Provide connection between arterial roads and local roads;
- May support arterial roads during peak periods; and
- May have been designed as local streets but can serve major traffic-generating developments or support non-local traffic.

The functional role of a 'Freeway or motorway/arterial roads' is explained as follows:

- Support major regional and inter-regional traffic movement; and
- Freeways and motorways usually feature strict.

4.2.4 Noise Assessment Criteria

Section 2.3 of the RNP outlines the criteria for assessing road traffic noise. The relevant sections of Table 3 of the RNP are shown in Table 4-5.

Table 4-5: Road Traffic Noise Assessment Criteria For Residential Land Uses, dB(A)

Road Category	Type of Project/Land Use	Assessment Criteria, dB(A)	
		Day (7 am-10 pm)	Night (10 pm-7 am)
Freeway/arterial/sub-arterial roads	3. Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	L_{Aeq} (15 hour) 60 dB (external)	L_{Aeq} (9 hour) 55 dB (external)

The noise level descriptor that has been adopted by the RNP for use with the above criteria is the L_{Aeq} .

4.2.5 Relative Increase Criteria

In addition to the assessment criteria outlined above, any increase in the total traffic noise level at a location due to a proposed project or traffic-generating development, must be considered. Residences experiencing increases in total traffic noise level above the relative criteria should also be considered for mitigation as described in Section 3.4 of the RNP. For road projects where the main subject road is a local road, the relative increase criterion does not apply.

Table 6 of the RNP outlines the relative increase criteria for residential land uses and is shown in Table 4-6.



Table 4-6: Relative Increase Criteria For Residential Land Uses, dB(A)

Road Category	Type of Project/Land Use	Total Traffic Noise Level Increase, dB(A)	
		Day (7 am-10 pm)	Night (10 pm-7 am)
Freeway/arterial/sub-arterial roads and transit ways	New road corridor/redevelopment of existing road/land use development with potential to generate additional traffic on existing road	Existing traffic $L_{Aeq} (15 \text{ hour}) + 12 \text{ dB}$ (external)	Existing traffic $L_{Aeq} (9 \text{ hour}) + 12 \text{ dB}$ (external)

The assessment criteria provided in Table 4-5 and the relative increase criteria provided in Table 4-6 should both be considered when designing project specific noise levels, and the lower of the two should be adopted. For example, if the assessment criteria is 60 dB(A) and the relative increase criteria is 42 dB(A), then a project specific noise level of 42 dB(A) should be adopted. Similarly, if the assessment criteria is 60 dB(A) and the relative increase criteria is 65 dB(A), a project specific noise level of 60 dB(A) should be adopted.

4.2.6 Exceedance of Criteria

If the criteria shown in both Table 4-5 and Table 4-6 cannot be achieved, justification should be provided that all feasible and reasonable mitigation measures have been applied.

For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding 'no build option'.

4.2.7 Assessment Locations for Existing Land Uses

Table 4-7: Assessment Locations for Existing Land Uses

Assessment Type	Assessment Location
External noise levels at residences	The noise level should be assessed at 1 metre from the façade and at a height of 1.5 metres from the floor. Separate noise criteria should be set and assessment carried out for each façade of a residence, except in straightforward situations where the residential façade most affected by road traffic noise can be readily identified. The residential noise level criterion includes an allowance for noise reflected from the façade ('façade correction'). Therefore, when taking a measurement in the free field where reflection during measurement is unlikely (as, for instance, when measuring open land before a residence is built), an appropriate correction – generally 2.5 dB – should be added to the measured value. The 'façade correction' should not be added to measurements taken 1 metre from the façade of an existing building. Free measurements should be taken at least 15 metres from any wall, building or other reflecting pavement surfaces on the opposite side of the roadway, and at least 3.5 metres from any wall, building or other pavement surface, behind or at the sides of the measurement point which would reflect the sound.
Noise levels at multi-level residential buildings	The external points of reference for measurement are the two floors of the building that are most exposed to traffic noise. On other floors, the internal noise level should be at least 10 dB less than the relevant external noise level on the basis of openable windows being opened sufficiently to provide adequate ventilation. (Refer to the Building Code of Australia (Australian Building Codes Board 2010) for additional information.)
Internal noise levels	Internal noise levels refer to the noise level at the centre of the habitable room that is most exposed to the traffic noise with openable windows being opened sufficiently to provide adequate ventilation (Refer to the Building Code of Australia (Australian Building Codes Board 2010) for additional information.)
Open space – passive or active use	The noise level is to be assessed at the time(s) and location(s) regularly attended by people using the space. In this regard, 'regular' attendance at a location means at least once a week.

4.2.8 Road Traffic Project Specific Noise Levels

Noise emission associated with existing road traffic unrelated to Redox operations were predicted in SoundPlan v7.3 using CoRTN algorithm. Further details are provided in section 5.3 of this report. Current traffic flows on the primary truck routes that will be used during the proposed operations (refer to Figure 4-1) were obtained from Transport & Urban Planning Pty Ltd. Traffic flow estimations were primarily based on a 2005 RMS publication and factoring up the vehicles volumes by 1% annual growth for 10 years. The number of light and heavy vehicles considered in the calculations is shown in Table 4-8.

Table 4-8: Existing Traffic Flow Unrelated to Redox Operations between 7am and 10pm

Road Segment	Light vehicle	Heavy vehicle	Total
Campbelltown Rd south of Ben Lomond Rd	20452	1076	21528
Raby Rd east of M31	19277	1015	20291
Campbelltown Rd south of Raby Rd	13329	702	14030
M31 on/off ramps	31856	1677	33533

Note: values represent total vehicles movements considering both directions.

The selected project specific noise levels associated with road traffic noise are presented in Table 4-9.

Table 4-9: Project Specific Noise Levels Associated with Road Traffic for the Day Time Period , dB(A)

Receptor	Existing Road Traffic Noise $L_{eq, 15 \text{ hour}}^{\#}$	Assessment Criteria $L_{eq, 15 \text{ hour}}$	Relative Increase Criteria $L_{eq, 15 \text{ hour}}$	PSNL $L_{eq, 15 \text{ hour}}$
R3-GF	60	60	72	60
R3-L1	66	60	78	68*
R5-GF	60	60	72	60
R5-L1	66	60	78	68*
R6-GF	61	60	73	63*
R6-L1	67	60	79	69*
R7-GF	63	60	75	65*
R7-L1	67	60	79	69*
R8-GF	61	60	73	63*
R8-L1	66	60	78	68*
R9-GF	58	60	70	60
R9-L1	61	60	73	63*

Note: # values based on Table 4-8,

* indicates PSNL based on existing road traffic noise + 2 dB



5. NOISE IMPACT ASSESSMENT

An outline of the predictive noise modelling methodology and operational/road traffic noise modelling scenarios have been provided below.

5.1 HOURS OF OPERATIONS

The proposed development would operate 24/7.

Trucks would access and leave the site during daytime only (7am and 10pm).

5.2 NOISE SOURCES

The sound power levels for the identified noise sources associated with the operational activities have been sourced from Benbow Environmental's extensive noise source database.

A-weighted third octave band centre frequency sound power levels have been used and are presented in Table 5-1. The noise sources utilised as part of this assessment are comprised of the primary noise generating activities associated with current operations.



Table 5-1: A-weighted Sound Power Levels Associated with Operational Activities, dB(A)

Noise Source	Overall	Third Octave Band Centre Frequency (Hz)									
		25	31	40	50	63	80	100	125	160	200
		250	315	400	500	630	800	1k	1.25k	1.6k	2k
		2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
Mixer	85	19	24	31	33	37	48	48	50	56	59
		63	68	74	78	78	78	76	77	72	70
		69	62	62	56	53	50	46	40	34	26
Pump	96	26	21	30	56	45	44	54	55	62	68
		68	75	84	87	84	89	88	85	86	81
		79	78	76	74	70	69	65	63	59	55
Blending Line	85	36	44	45	43	47	49	54	55	56	60
		64	67	70	72	73	74	75	75	75	75
		75	73	72	68	67	64	59	56	51	46
Gas Forklift "25 Nissan"	92	36	59	61	51	65	66	77	68	60	62
		66	69	74	81	78	78	81	85	84	84
		81	75	71	71	65	63	56	51	45	42
Truck Manoeuvring at 10km/h	102	47	61	61	67	86	81	72	81	81	83
		83	85	91	91	90	91	93	92	92	92
		92	91	88	85	83	81	80	76	68	61

5.3 MODELLING METHODOLOGY

5.3.1 Noise Model

Predictive Noise Modelling was carried out in SoundPLAN v7.3 using the Concawe and CoRTN algorithms when assessing operational noise and road traffic noise respectively. This model has been extensively utilised by Benbow Environmental for assessing noise emissions for existing and proposed developments, and is recognised by regulatory authorities throughout Australia. The model allows for the prediction of noise from a site, at the specified receptor, by calculating the contribution of each noise source.

The noise sources as well as the topographical features of the subject area, surrounding buildings and receiver locations, were all input into the noise model to determine the noise emissions of the proposed development at the nearest potentially affected residences.

The modelling scenario has been carried out using $L_{Aeq, 15 \text{ minutes}}$ descriptor when assessing operational noise whilst $L_{Aeq, 15 \text{ hours}}$ when assessing road traffic noise. Using these descriptors, noise emission levels were predicted at the nearest potentially affected sensitive receptors to determine the noise impact against the relevant noise criteria in accordance with the INP and RNP.

5.3.2 Assumptions Made for Noise Modelling

It should be noted that the relevant assessment period for operational noise emissions has been considered to be 15 minutes. Therefore noise source durations detailed in the following assumptions should be considered per 15 minute period in view of potential noise impacts under worst-case scenarios. Each assessment-specific assumption has been detailed below:

- Off-site topographical information was obtained from the Department of Lands, Six Maps, with contour maps having intervals of 10 m whilst on-site contours were supplied by the proponent;
- Off-site structures such as the primary industrial and commercial buildings surrounding the subject site have been included in the model;
- All residential, school and industrial receptors were modelled at 1.5 m above ground level. In addition, residential receptors R3, R5, R6, R7, R8, and R9 have been modelled as 2 storey residences;
- A 1.8m high colorbond fence has been placed between the backyard of receptors R3, R5, R6, R7, R8, and R9 and the respective road;
- All ground areas have been modelled considering a ground factor of 0;
- Trucks have been modelled considering two moving point sources at heights of 1.5 m and 3 m above ground level in order to account for the engine (1.5 m) and the exhaust outlet (3 m). An on-site speed of 10 km/hr has been considered;



- Mixers, pumps and forklift have been modelled as point sources and will be operational for 100% of the assessment period;
- Blending line has been modelled as a line point source and will be operational for 100% of the assessment period;
- The proposed building has been modelled as an industrial building. The facades of the structure have been modelled as 150mm concrete (R_w 54dB);
- Several factors such as gradient, road surface and mean speed have been considered in the road traffic assessment; and
- The cumulative number of vehicles related to Redox operations is shown in Table 5-2. This information was based on the Traffic Impact Assessment undertaken by Transport & Urban Planning Pty Ltd released in March 2015 (Ref. 14228r).

Table 5-2: Traffic Flow Related to Redox Operations

Truck Movements	Direction	Light vehicle	Heavy vehicle	Total
Existing	From site to north	74	56	130
	From north to site	74	56	130
Proposed	From site to north	12	10	22
	From north to site	12	10	22
Cumulative	From site to north	86	66	152
	From north to site	86	66	152

Note: value in bold indicates most relevant descriptor

5.3.3 Noise Modelling Scenarios

One (1) operational scenario was established for the modelling of operational noise generation. The scenario is detailed in Table 5-3.

Table 5-3: Modelled Noise Scenario for Proposed Operations

Scenario	Time Period	Noise Sources for Worst 15-minute Period
Operational Scenario	Day	• Six (6) mixers within proposed building; • Four (4) pumps within proposed building; • One (1) blending line within proposed building; • One forklift located outdoors near the proposed building; and • One (1) truck arriving and one (1) truck leaving within a 15-minute period.

5.3.4 Meteorological Factors

The scenario was run with default noise enhancing meteorological conditions. The following conditions were considered:

- Condition A: neutral weather conditions; and
- Condition B: 3 m/s wind from source to receptor.

These meteorological conditions have been displayed in detail in Table 5-4.

Table 5-4: Meteorological Conditions Assessed in Noise Propagation Modelling

Condition	Classification	Ambient Temp.	Ambient Humidity	Wind Speed	Wind Direction	Temperature Inversion	Affected Receiver	Applicability
A	Neutral	10 °C	70%	-	-	-	All	All periods
B	Gradient Flow	10 °C	70%	3m/s	Receiver	-	All	All periods



5.4 OPERATIONAL PREDICTED NOISE LEVELS

Results of the predictive noise modelling without considering any control measures have been displayed in Table 5-5.

Table 5-5: Noise Modelling Results, dB(A) – L_{eq}, 15 minute

Receptor	Current Noise Impact		Proposed Noise Impact		Cumulative Noise Impact		Adopted PSNL		
	Condition A	Condition B	Condition A	Condition B	Condition A	Condition B	Day	Evening	Night
Residential Receptors									
R1	32	36	26	32	33	37	43	43	42
R2	32	36	25	30	33	37	43	43	42
R3-GF	32	36	23	27	33	37	46	46	46
R3-L1	32	36	28	33	34	38	46	46	46
R4	32	36	23	27	32	37	46	46	46
R5-GF	32	36	24	27	33	37	46	46	46
R5-L1	32	36	30	33	34	38	46	46	46
R6-GF	32	36	26	30	33	37	46	46	46
R6-L1	32	36	32	36	35	39	46	46	46
R7-GF	27	31	19	24	28	32	46	46	46
R7-L1	27	31	20	25	28	32	46	46	46
R8-GF	32	36	31	36	34	39	46	46	46
R8-L1	32	36	33	38	36	40	46	46	46
R9-GF	27	31	25	31	29	34	46	46	46
R9-L1	27	31	26	31	29	34	46	46	46
R10	30	34	23	29	31	35	43	43	42
School									
R11	39	44	46	48	47	48	45		
Industrial Receptors									
R12	69	69	48	50	69	69	70		
R13	69	69	53	54	69	69	70		

Note: Shaded cells indicate that the predicted noise level exceeds the project specific noise level

Comments:

The cumulative noise impact associated with operational activities was predicted to comply with the adopted project specific noise levels at all residential and industrial receptors when assessing $L_{Aeq,15 \text{ minute}}$ descriptor. However, a noise exceedance up to 3 dB was predicted at the school receptor during adverse weather conditions primarily due to trucks manoeuvring in the northern entry/exit area of the site. This noise exceedance is considered to be irrelevant as a noise increase of less than 3 dB is slightly perceptible by the human hearing. In addition, noise generated by off-site traffic is likely to generate even higher noise levels at the school compared to on-site traffic noise generation. Based on these facts, noise control measures such as increasing the height of the fence located at the backyard of the school is not considered necessary. Alternatively, there are several safeguards that can be recommended aimed at limiting potential noise emission issues. These have been detailed below.

- **Truck Movements:**

Movement of trucks and mobile equipment on-site is to be restricted to the assumptions taken in this report. Site management is to ensure that the necessary timetabling and organisation of contractors is conducted in a manner that accommodates this requirement.

The following practical on-site vehicle movement practices are highly recommended:

- ▶ Low on-site speed limits;
- ▶ No use of horns or engine brakes when entering/exiting the site;
- ▶ Adequate access road design/maintenance.

- **Maintenance of Equipment:**

Mechanical equipment in poor condition will create more noise than well maintained equipment. It is important to ensure that all vehicles, machinery and ancillary equipment meet the appropriate environmental noise requirements.

5.5 ROAD TRAFFIC PREDICTED NOISE LEVELS

Results of the predictive noise modelling have been displayed in Table 5-6.

Table 5-6: Predicted Noise Levels Associated with Road Traffic, dB(A)

Receptor	Existing Road Traffic Noise $L_{eq,15 \text{ hour}}^{\#}$	Cumulative Site Noise Contribution $L_{eq,15 \text{ hour}}^{\wedge}$	Total Cumulative Noise $L_{eq,15 \text{ hour}}$	PSNL $L_{eq,15 \text{ hour}}$
R3-GF	60	47	60	60
R3-L1	66	53	66	68
R5-GF	60	47	60	60
R5-L1	66	53	66	68
R6-GF	61	48	62	63
R6-L1	67	54	67	69
R7-GF	63	46	63	65
R7-L1	67	50	67	69
R8-GF	61	46	61	63
R8-L1	66	51	66	68
R9-GF	58	41	58	60
R9-L1	61	44	61	63

Note: # values based on Table 4-8

^ indicates PSNL based on existing road traffic noise + 2 dB

Comments:

The noise impact associated with site road traffic was predicted to readily comply with the project specific noise levels when assessing L_{Aeq} descriptor. Over 1,000 heavy vehicles unrelated to Redox operations currently used the proposed truck routes during the day time period. As the proposed total traffic flow associated with Redox is not expected to exceed 66 trucks, the noise increase at the residential locations surrounding the area is considered to be negligible.



6. STATEMENT OF POTENTIAL NOISE IMPACT

A noise impact assessment was undertaken to assess the noise emissions for additions to the existing Redox premises located at 2 Swettenham Road, Minto. In particular, this report details the findings of operational and road traffic noise impacts from the proposed operations.

The noise survey was undertaken in accordance with the following guidelines:

- *NSW Environment Protection Authority, Industrial Noise Policy (EPA 2000) (INP); and*
- *Department of Environment, Climate Change and Water NSW, Road Noise Policy (DECCW 2011) (RNP).*

The cumulative noise impact associated with the existing and proposed operational activities is predicted to comply with the project specific noise levels at all residential receptors and industrial receptors when assessing the L_{Aeq} descriptor. A noise exceedance of 3 dB was predicted at the school located in the northern entry/exit of the site during adverse weather conditions. This exceedance is considered to be insignificant primarily due to the fact that noise generated by off-site traffic unrelated to Redox activities is likely to generate higher noise levels at the school. In addition, considering that the school is located in an industrial area, an external noise level of 48 dB(A) L_{eq} is considered to be acceptable.

In addition, the expected traffic associated with Redox activities along the proposed routes is minimal compared to current unrelated Redox traffic flows in the area. Further noise predictions were carried out and found to readily comply with the project specific noise levels at all residential receptors.

Based on the information provided above, Benbow Environmental believes that the site is very suitable to increase their operations in accordance with the assumptions listed throughout this report.

This concludes the report.

Prepared by:

A handwritten signature in black ink, appearing to read 'R T Benbow'.

R T Benbow
Principal Consultant



7. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

This report has been prepared solely for the use of Redox Pty Ltd, as per our agreement for providing environmental services. Only Redox Pty Ltd is entitled to rely upon the findings in the report within the scope of work described in this report. Otherwise, no responsibility is accepted for the use of any part of the report by another in any other context or for any other purpose.

Although all due care has been taken in the preparation of this study, no warranty is given, nor liability accepted (except that otherwise required by law) in relation to any of the information contained within this document. We accept no responsibility for the accuracy of any data or information provided to us by Redox Pty Ltd for the purposes of preparing this report.

Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.

ATTACHMENTS

'A' FREQUENCY WEIGHTING

The 'A' frequency weighting roughly approximates to the Fletcher-Munson 40 phon equal loudness contour. The human loudness perception at various frequencies and sound pressure levels is equated to the level of 40 dB at 1 kHz. The human ear is less sensitive to low frequency sound and very high frequency sound than midrange frequency sound (i.e. 500 Hz to 6 kHz). Humans are most sensitive to midrange frequency sounds, such as a child's scream. Sound level meters have inbuilt frequency weighting networks that very roughly approximates the human loudness response at low sound levels. It should be noted that the human loudness response is not the same as the human annoyance response to sound. Here low frequency sounds can be more annoying than midrange frequency sounds even at very low loudness levels. The 'A' weighting is the most commonly used frequency weighting for occupational and environmental noise assessments. However, for environmental noise assessments, adjustments for the character of the sound will often be required.

AMBIENT NOISE

The ambient noise level at a particular location is the overall environmental noise level caused by all noise sources in the area, both near and far, including all forms of traffic, industry, lawnmowers, wind in foliage, insects, animals, etc. Usually assessed as an energy average over a set time period 'T' ($L_{Aeq,T}$).

AUDIBLE

Audible refers to a sound that can be heard. There are a range of audibility grades, varying from "barely audible", "just audible" to "clearly audible" and "prominent".

BACKGROUND NOISE LEVEL

Total silence does not exist in the natural or built-environments, only varying degrees of noise. The Background Noise Level is the minimum repeatable level of noise measured in the absence of the noise under investigation and any other short-term noises such as those caused by all forms of traffic, industry, lawnmowers, wind in foliage, insects, animals, etc.. It is quantified by the noise level that is exceeded for 90 % of the measurement period 'T' ($L_{A90,T}$). Background Noise Levels are often determined for the day, evening and night time periods where relevant. This is done by statistically analysing the range of time period (typically 15 minute) measurements over multiple days (often 7 days). For a 15 minute measurement period the Background Noise Level is set at the quietest level that occurs at 1.5 minutes.

DECIBEL

The decibel (dB) is a logarithmic scale that allows a wide range of values to be compressed into a more comprehensible range, typically 0 dB to 120 dB. The decibel is ten times the logarithm of the ratio of any two quantities that relate to the flow of energy (i.e. power). When used in acoustics it is the ratio of square of the sound pressure level to a reference sound pressure level, the ratio of the sound power level to a reference sound power level, or the ratio of the sound intensity level to a reference sound intensity level. See also Sound Pressure Level and Sound Power Level. Noise levels in decibels cannot be added arithmetically since they are logarithmic numbers. If one machine is generating a noise level of 50 dB, and another similar machine is placed beside it, the level will increase to 53 dB (from $10 \log_{10} (10^{(50/10)} + 10^{(50/10)})$) and not 100 dB. In theory, ten similar machines placed side by side will increase the sound level by 10 dB, and one hundred machines increase the sound level by 20 dB. The human ear has a vast sound-sensitivity range of over a thousand billion to one so the logarithmic decibel scale is useful for acoustical assessments.

dBA – See ‘A’ frequency weighting

dB(C) – See ‘C’ frequency weighting

EQUIVALENT CONTINUOUS SOUND LEVEL, LAeq

Many sounds, such as road traffic noise or construction noise, vary repeatedly in level over a period of time. More sophisticated sound level meters have an integrating/averaging electronic device inbuilt, which will display the energy time-average (equivalent continuous sound level - L_{Aeq}) of the ‘A’ frequency weighted sound pressure level. Because the decibel scale is a logarithmic ratio, the higher noise levels have far more sound energy, and therefore the L_{Aeq} level tends to indicate an average which is strongly influenced by short term, high level noise events. Many studies show that human reaction to level-varying sounds tends to relate closer to the L_{Aeq} noise level than any other descriptor.

‘F’(FAST) TIME WEIGHTING

Sound level meter design-goal time constant which is 0.125 seconds.

FREE FIELD

In acoustics a free field is a measurement area not subject to significant reflection of acoustical energy. A free field measurement is typically not closer than 3.5 metres to any large flat object (other than the ground) such as a fence or wall or inside an anechoic chamber.

FREQUENCY

The number of oscillations or cycles of a wave motion per unit time, the SI unit is the hertz (Hz). 1 Hz is equivalent to one cycle per second. 1000 Hz is 1 kHz.

IMPULSE NOISE

An impulse noise is typified by a sudden rise time and a rapid sound decay, such as a hammer blow, rifle shot or balloon burst.

MAXIMUM NOISE LEVEL, L_{AFmax}

The root-mean-square (rms) maximum sound pressure level measured with sound level meter using the 'A' frequency weighting and the 'F' (Fast) time weighting. Often used for noise assessments other than aircraft.

NOISE

Noise is unwanted, harmful or inharmonious (discordant) sound. Sound is wave motion within matter, be it gaseous, liquid or solid. Noise usually includes vibration as well as sound.

OFFENSIVE NOISE

Reference: Dictionary of the NSW Protection of the Environment Operations Act 1997).

"Offensive Noise means noise:

(a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:

(i) is harmful to (or likely to be harmful to) a person who is outside the premise from which it is emitted, or

(ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or

(b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances prescribed by the regulations."

SOUND ABSORPTION COEFFICIENT, α

Sound is absorbed in porous materials by the viscous conversion of sound energy to a small amount of heat energy as the sound waves pass through it. Sound is similarly absorbed by the flexural bending of internally damped panels. The fraction of incident energy that is absorbed is termed the Sound Absorption Coefficient, α . An absorption coefficient of 0.9 indicates that 90 % of the incident sound energy is absorbed. The average α from 250 to 2 kHz is termed the Noise Reduction Coefficient (NRC).

SOUND ATTENUATION

A reduction of sound due to distance, enclosure or some other device. If an enclosure is placed around a machine, or an attenuator (muffler or silencer) is fitted to a duct, the noise emission is reduced or attenuated. An enclosure that attenuates the noise level by 20 dB reduces the sound energy by one hundred times.

SOUND PRESSURE

The rms sound pressure measured in pascals (Pa). A pascal is a unit equivalent to a newton per square metre (N/m^2).

SOUND PRESSURE LEVEL, L_p

The level of sound measured on a sound level meter and expressed in decibels (dB). Where $L_p = 10 \log_{10} (\text{Pa}/\text{Po})^2$ dB (or $20 \log_{10} (\text{Pa}/\text{Po})$ dB) where Pa is the rms sound pressure in Pascal and Po is a reference sound pressure conventionally chosen is $20 \mu\text{Pa}$ (20×10^{-6} Pa) for airborne sound. L_p varies with distance from a noise source.

SOUND POWER

The rms sound power measured in watts (W). The watt is a unit defined as one joule per second. A measures the rate of energy flow, conversion or transfer.

SOUND POWER LEVEL, L_w

The sound power level of a noise source is the inherent noise of the device. Therefore sound power level does not vary with distance from the noise source or with a different acoustic environment. $L_w = L_p + 10 \log_{10} 'a'$ dB, re: 1pW, (10^{-12} watts) where 'a' is the measurement noise-emission area (m^2) in a free field.

SOUND TRANSMISSION CLASS (STC)

An internationally standardised method of rating the sound transmission loss of partition walls to indicate the sound reduction from one side of a partition to the other in the frequency range of 125 Hz to 4000 kHz. (Refer: Australian Standard AS 1276 – 1979). Now not in general use in Australia see: weighted sound reduction index.

SOUND TRANSMISSION LOSS

The amount in decibels by which a random sound is reduced as it passes through a sound barrier. A method for the measurement of airborne Sound Transmission Loss of a building partition is given in Australian Standard AS 1191 - 2002.

STATISTICAL NOISE LEVELS, L_n .

Noise which varies in level over a specific period of time 'T' (standard measurement times are 15 minute periods) may be quantified in terms of various statistical descriptors for example:-

- The noise level, in decibels, exceeded for 1 % of the measurement time period, when 'A' frequency weighted and 'F' time weighted is reference to as $L_{AF1, T}$. This may be used for describing short-term noise levels such as could cause sleep arousal during the night.
- The noise level, in decibels, exceeded for 10 % of the measurement time period, when 'A' frequency weighted and 'F' time weighted is reference to as $L_{AF10, T}$. In most countries the $L_{AF10, T}$ is measured over periods of 15 minutes, and is used to describe the average maximum noise level.
- The noise level, in decibels, exceeded for 90 % of the measurement time period, when 'A' frequency weighted and 'F' time weighted is reference to as $L_{AF90, T}$. In most countries the $L_{AF90, T}$ is measured over periods of 15 minutes, and is used to describe the average minimum or background noise level.

STEADY NOISE

Noise, which varies in level by 6 dB or less, over the period of interest with the time-weighting set to "Fast", is considered to be "steady". (Refer AS 1055.1 1997).

WEIGHTED SOUND REDUCTION INDEX, R_w

This is a single number rating of the airborne sound insulation of a wall, partition or ceiling. The sound reduction is normally measured over a frequency range of 100 Hz to 3.150 kHz and averaged in accordance with ISO standard weighting curves (Refer AS/NZS 1276.1:1999). Internal partition wall $R_w + C$ ratings are frequency weighted to simulate insulation from human voice noise. The $R_w + C$ is similar in value to the STC rating value. External walls, doors and windows may be $R_w + C_{tr}$ rated to simulate insulation from road traffic noise. The spectrum adaptation term C_{tr} adjustment factor takes account of low frequency noise. The weighted sound reduction index is normally similar or slightly lower number than the STC rating value.

Calibration of Sound Level Meters

A sound level meter requires regular calibration to ensure its measurement performance remains within specification. Benbow Environmental sound level meters are calibrated by a National Association of Testing Authority (NATA) registered laboratory or a laboratory approved by the NSW Environment Protection Authority (EPA) every two years and after each major repair, in accordance with AS 1259-1990.

The calibration of the sound level meter was checked immediately before and after each series of measurements using an acoustic calibrator. The acoustic calibrator provides a known sound pressure level, which the meter indicates when the calibrator is activated while positioned on the meter microphone.

The sound level meters also incorporate an internal calibrator for use in setting up. This provides a check of the electrical calibration of the meter, but does not check the performance of the microphone. Acoustical calibration checks the entire instrument including the microphone. Calibration certificates for the instrument sets used have been included as Attachment 3.

Care and Maintenance of Sound Level Meters

Noise measuring equipment contains delicate components and therefore must be handled accordingly. The equipment is manufactured to comply with international and national standards and is checked periodically for compliance. The technical specifications for sound level meters used in Australia are defined in Australian Standard AS 1259 – 1990 “*Sound Level Meters*”.

The sound level meters and associated accessories are protected during storage, measurement and transportation against dirt, corrosion, rapid changes of temperature, humidity, rain, wind, vibration, electric and magnetic fields. Microphone cables and adaptors are always connected and disconnected with the power turned off. Batteries are removed (with the instrument turned off) if the instrument is not to be used for some time.

Investigation Procedures

All investigative procedures were conducted in accordance with AS 1055.1-1997 *Acoustics – “Description and Measurement of Environmental Noise (Part 1: General Procedures)”*.

The following information was recorded and kept for reference purposes:

- type of instrumentation used and measurement procedure conducted;
- description of the time aspect of the measurements, ie. measurement time intervals; and
- positions of measurements and the time and date were noted.

As per AS 1055.1-1997, all measurements were carried out at least 3.5 m from any reflecting structure other than the ground. The preferred measurement height of 1.2 m above the ground was utilised. A sketch of the area was made identifying positions of measurement and the approximate location of the noise source and distances in meters (approx.).

Unattended Noise Monitoring

NOISE MONITORING EQUIPMENT

ARL noise loggers type Ngara and EL-215 were used to conduct the long-term unattended noise monitoring. This equipment complies with Australian Standard 1259.2–1990 "Acoustics – Sound Level Meters" and is designated as a Type 1 and Type 2 instrument suitable for field use.

The measured data is processed statistically and stored in memory every 15 minutes. The equipment was calibrated prior and subsequent to the measurement period using a Rion NC-73 sound level calibrator. There were no significant variances observed in the reference signal between the pre-measurement and post-measurement calibrations. Instrument calibration certificates have also been included in Attachment 3.

METEOROLOGICAL CONSIDERATION DURING MONITORING

For the long-term attended monitoring, meteorological data for the relevant period were provided by the Bureau of Meteorology, which was considered representative of the site for throughout the monitoring period.

DESCRIPTORS & FILTERS USED FOR MONITORING

Noise levels are commonly measured using A-weighted filters and are usually described as dB(A). The "A-weighting" refers to standardised amplitude versus frequency curve used to "weight" sound measurements to represent the response of the human ear. The human ear is less sensitive to low frequency sound than it is to high frequency sound. Overall A-weighted measurements quantify sound with a single number to represent how people subjectively hear different frequencies at different levels.

Noise environments can be described using various descriptors depending on characteristics of noise or purpose of assessments. For this survey the L_{A90} was used to analyse the monitoring results. The statistical descriptors L_{A90} measures the noise level exceeded for 90% of the sample measurement time, and is used to describe the "Background noise". Background noise is the underlying level of noise present in the ambient noise, excluding extraneous noise or the noise source under investigation.

Measurement sample periods were fifteen minutes. The Noise -vs- Time graphs representing measured noise levels at the noise monitoring location are presented in Attachment 4.

ATTENDED NOISE MONITORING

NOISE MONITORING EQUIPMENT

The attended short-term noise monitoring was carried out using a SVANTEK SVAN957 Class 1 Precision Sound Level Meter. The instrument was calibrated by a NATA accredited laboratory within two years of the measurement period. The instrument sets comply with AS 1259 and was set on A-weighted, fast response.

The microphone was positioned at 1.5 metres above ground level and was fitted with a windsock. The instrument was calibrated using a Rion NC-73 sound level calibrator prior and subsequent to the measurement period to ensure the reliability and accuracy of the instrument sets. There were no significant variances observed in the reference signal between the pre-measurement and post-measurement calibrations. Instrument calibration certificates have also been included in Attachment 3.

WEATHER CONDITIONS

It was clear, fine without significant breeze.

METHODOLOGY

The attended noise measurements were carried out generally in accordance with Australian Standard AS1055-1997 - "Acoustics – Description and Measurement of Environmental Noise".

Attachment 3: Calibration Certificates

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: 15831

EQUIPMENT TESTED: Sound Level Calibrator

Manufacturer: Rion
Type No: NC-73 Serial No: 10186522
Owner: Benbow Environmental
13 Daking Street
North Parramatta NSW 2151

Tests Performed: Measured output pressure level was found to be:

Parameter	Pre-Adj	Adj Y/N	Output: (db re 20 µPa)	Frequency: (Hz)	THD&N (%)
Level 1:	NA	N	94.03	993.9	0.56
Level 2:	NA	N	NA	NA	NA
Uncertainty:			±0.11 dB	±0.05 Hz	±0.2 %
Uncertainty (at 95% c.i.) k=2					

CONDITION OF TEST:

Ambient Pressure: 1008 hPa ±1.5 hPa Relative Humidity: 68% ±5%

Temperature: 23 °C ±2° C

Date of Calibration: 27/03/2014

Issue Date: 27/03/2014

Acu-Vib Test Procedure: AVP02 (Calibrators)

Test Method: AS IEC 60942 - 2004

CHECKED BY: *MM* AUTHORISED SIGNATURE: *Jack Klett*

Accredited for compliance with ISO/IEC 17025

The results of the tests, calibration and/or measurements included in this document are traceable to Australian/national standards.



Accredited Lab. 9262
Acoustic and Vibration
Measurements



HEAD OFFICE
Unit 14, 22 Hudson Ave. Castle Hill NSW 2154
Tel: (02) 96808133 Fax: (02) 96808233
Mobile: 0413 809605
Web site: www.acu-vib.com.au

CERTIFICATE OF CALIBRATION

CERTIFICATE NO.: SLM 39750 & FILT 0166

Equipment Description: Sound & Vibration Analyser

Manufacturer: Svantek
Model No: Svan-957 Serial No: 15335
Microphone Type: 7052E Serial No: 47869
Filter Type: 1/3 Octave Serial No: 15335

Comments: All tests passed for type 1.
(See over for details)

Owner: Benbow Environmental
13 Daking Street
North Parramatta NSW 2151

Ambient Pressure: 1013 hPa ± 1.5 hPa

Temperature: 23 °C $\pm 2^\circ$ C Relative Humidity: 48% $\pm 5\%$

Date of Calibration: 16/07/2013 Issue Date: 16/07/2013

Acu-Vib Test Procedure: AVP05 (SLM) & AVP06 (Filters)

CHECKED BY: *DW*

AUTHORISED SIGNATURE: *Jack Klett*

Accredited for compliance with ISO/IEC 17025
The results of the tests, calibration and/or measurements included in this document are traceable to
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Accredited Lab. No. 9262
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Page 1 of 2
AVCERT05 Rev. 1.1 11.08.13



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Calibration Certificate

Number : C13671

Client Details : Benbow Environmental

13 Daking Street
North Parramatta NSW 2151

Equipment Tested/ Model Number : ARL Ngara

Instrument Serial Number : 8780AE

Microphone Serial Number : 13743

Preamplifier Serial Number : 27982

Ambient Temperature : 22°C

Relative Humidity : 48%

Barometric Pressure : 100.62 kPa

Calibration Technician : Adrian Walker

Calibration Date : 09-December-2013

Secondary Check by : Sandra Minto

Report Issue Date : 09-December-2013

Approved Signatory :

Tested To : AS1259.1:1990

AS1259.2:1990

Comments : All tests passed for type 1

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
10.2.2: Absolute sensitivity	Pass	10.4.5: R.M.S performance	Pass
10.2.3: Frequency weighting	Pass	9.3.2: Time averaging	Pass
10.3.2: Overload indications	Pass	9.3.5: Overload indication	Pass
8.9: Detector-indicator linearity	Pass		
8.10: Differential level linearity	Pass		
10.3.4: Inherent weighted system noise level	Pass		
10.4.2: Time weighting characteristics F and S	Pass		



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Sound Level Meter
AS 1259.1:1990 - AS 1259.2:1990
Calibration Certificate

Calibration Number C14383

Client Details Benbow Environmental
13 Daking Street
North Parramatta NSW 2151

Equipment Tested/ Model Number : ARL EL-215
Instrument Serial Number : 194438
Microphone Serial Number : N/A
Pre-amplifier Serial Number : N/A

Atmospheric Conditions

Ambient Temperature : 25°C
Relative Humidity : 27.1%
Barometric Pressure : 100.78kPa

Calibration Technician : Luke Hudson
Calibration Date : 14/07/2014

Secondary Check: Tim Williams
Report Issue Date : 14/07/2014

Approved Signatory :

Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
10.2.2: Absolute sensitivity	Pass	10.3.4: Inherent system noise level	Pass
10.2.3: Frequency weighting	Pass	10.4.2: Time weighting characteristic F and S	Pass
10.3.2: Overload indications	Pass	10.4.3: Time weighting characteristic I	Pass
10.3.3: Accuracy of level range control	Pass	10.4.5: R.M.S performance	Pass
8.9: Detector-indicator linearity	Pass	9.3.2: Time averaging	Pass
8.10: Differential level linearity	Pass	9.3.5: Overload indication	Pass

Least Uncertainties of Measurement -

Acoustic Tests

31.5 Hz to 8kHz: $\pm 0.120dB$
12.5kHz: $\pm 0.165dB$
16kHz: $\pm 0.245dB$

Electrical Tests

31.5 Hz to 20 kHz: $\pm 0.098dB$

Environmental Conditions

Temperature: $\pm 0.3^{\circ}C$
Relative Humidity: $\pm 4.1\%$
Barometric Pressure: $\pm 0.1kPa$

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.



This calibration certificate is to be read in conjunction with the calibration test report.

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The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/National standards.



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Calibration Certificate

Number : C13669

Client Details : Benbow Environmental

13 Daking Street

North Parramatta NSW 2151

Equipment Tested/ Model Number : ARL Ngara

Instrument Serial Number : 8780AC

Microphone Serial Number : 317859

Preamplifier Serial Number : 27984

Ambient Temperature : 23°C

Relative Humidity : 50%

Barometric Pressure : 100.4 kPa

Calibration Technician : Jeff Yu

Calibration Date : 04-December-2013

Secondary Check by : Sandra Minto

Report Issue Date : 09-December-2013

Approved Signatory :

Tested To : AS1259.1:1990

AS1259.2:1990

Comments : All tests passed for type I

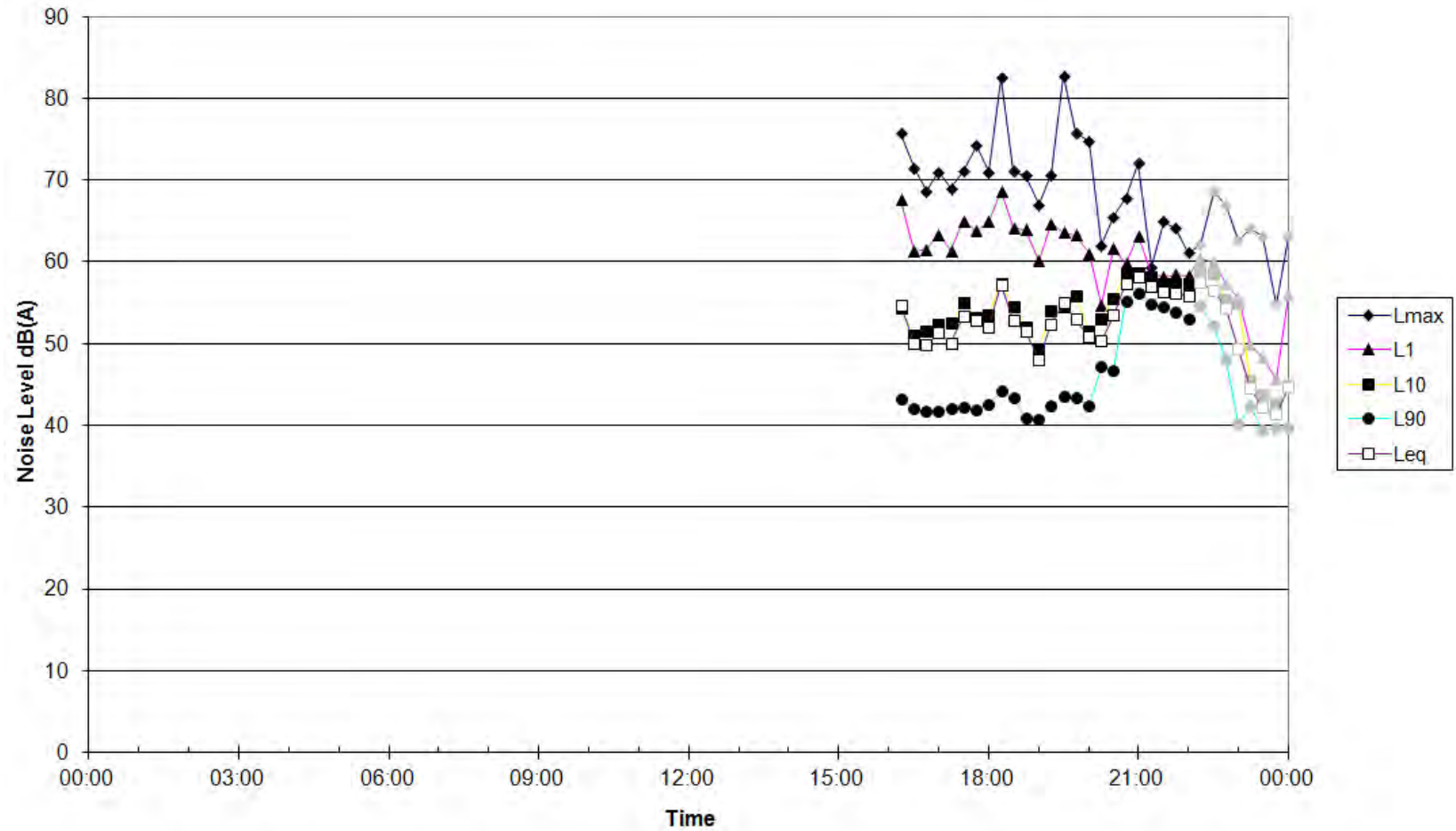
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10.2.3: Frequency weighting	Pass	9.3.2: Time averaging	Pass
10.3.2: Overload indications	Pass	9.3.5: Overload indication	Pass
8.9: Detector-indicator linearity	Pass		
8.10: Differential level linearity	Pass		
10.3.4: Inherent weighted system noise level	Pass		
10.4.2: Time weighting characteristics F and S	Pass		



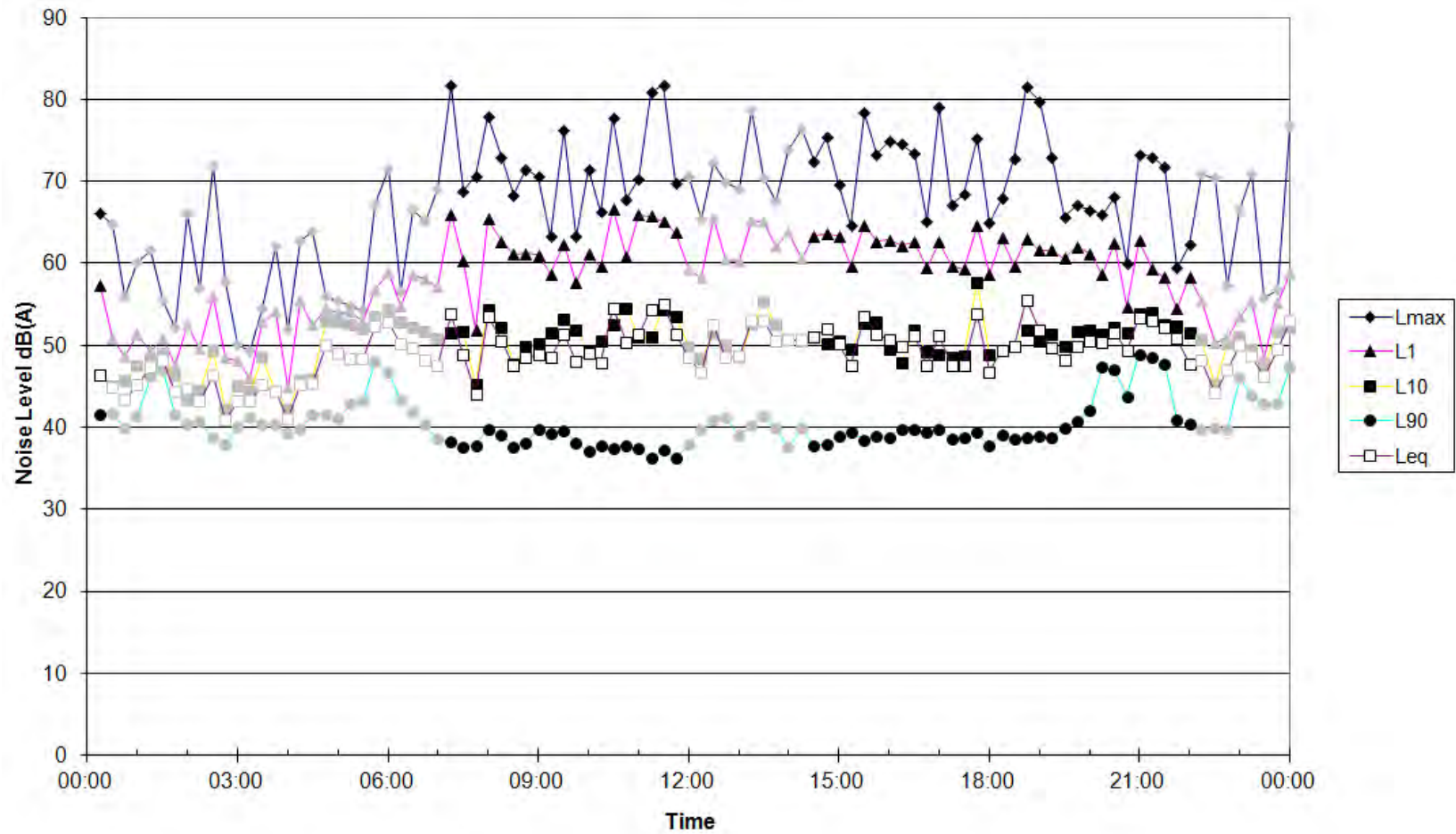
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Attachment 4: Daily Noise Logger Charts

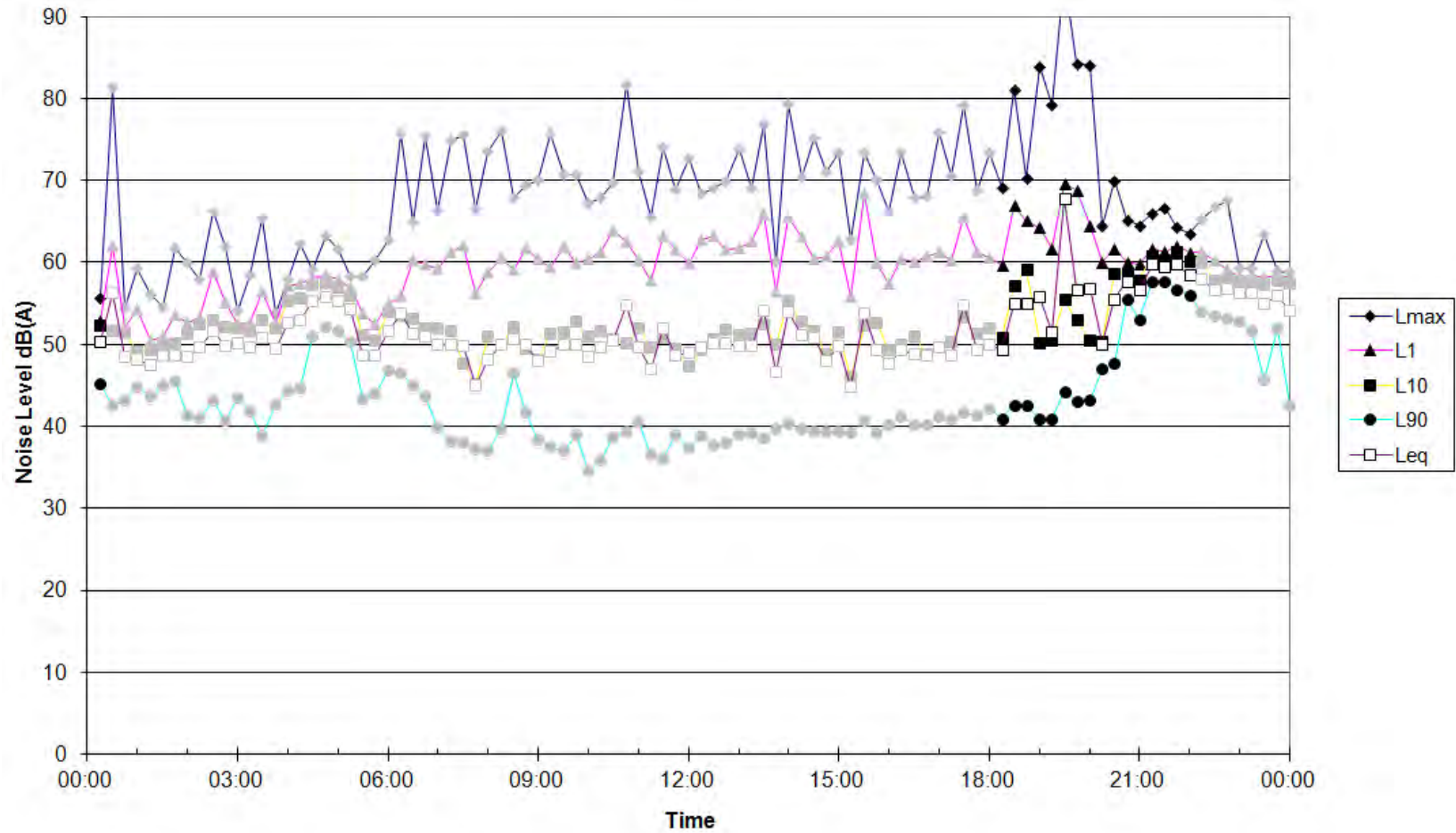
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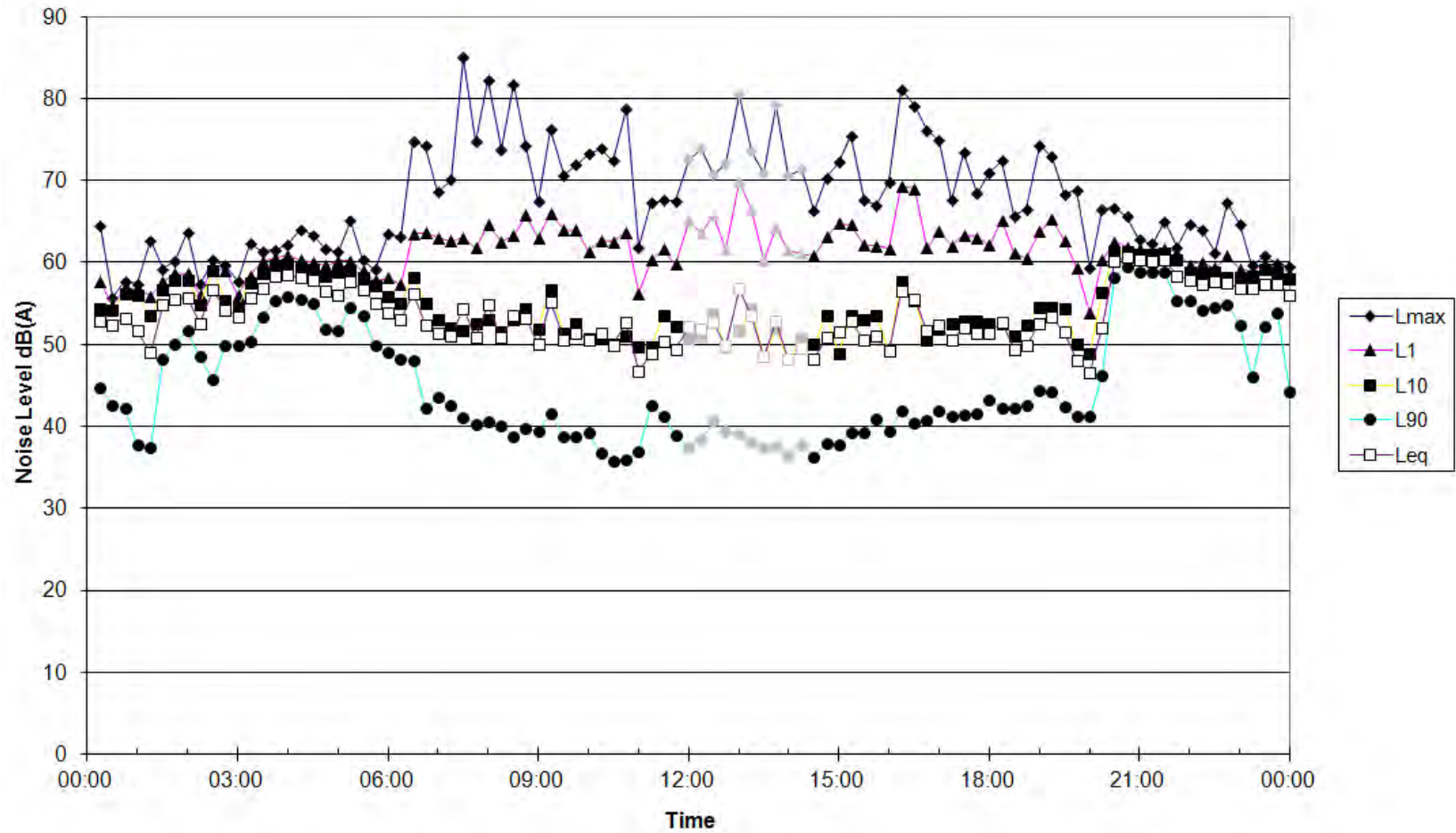
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Receptor R2 - Saturday 21/02/2015



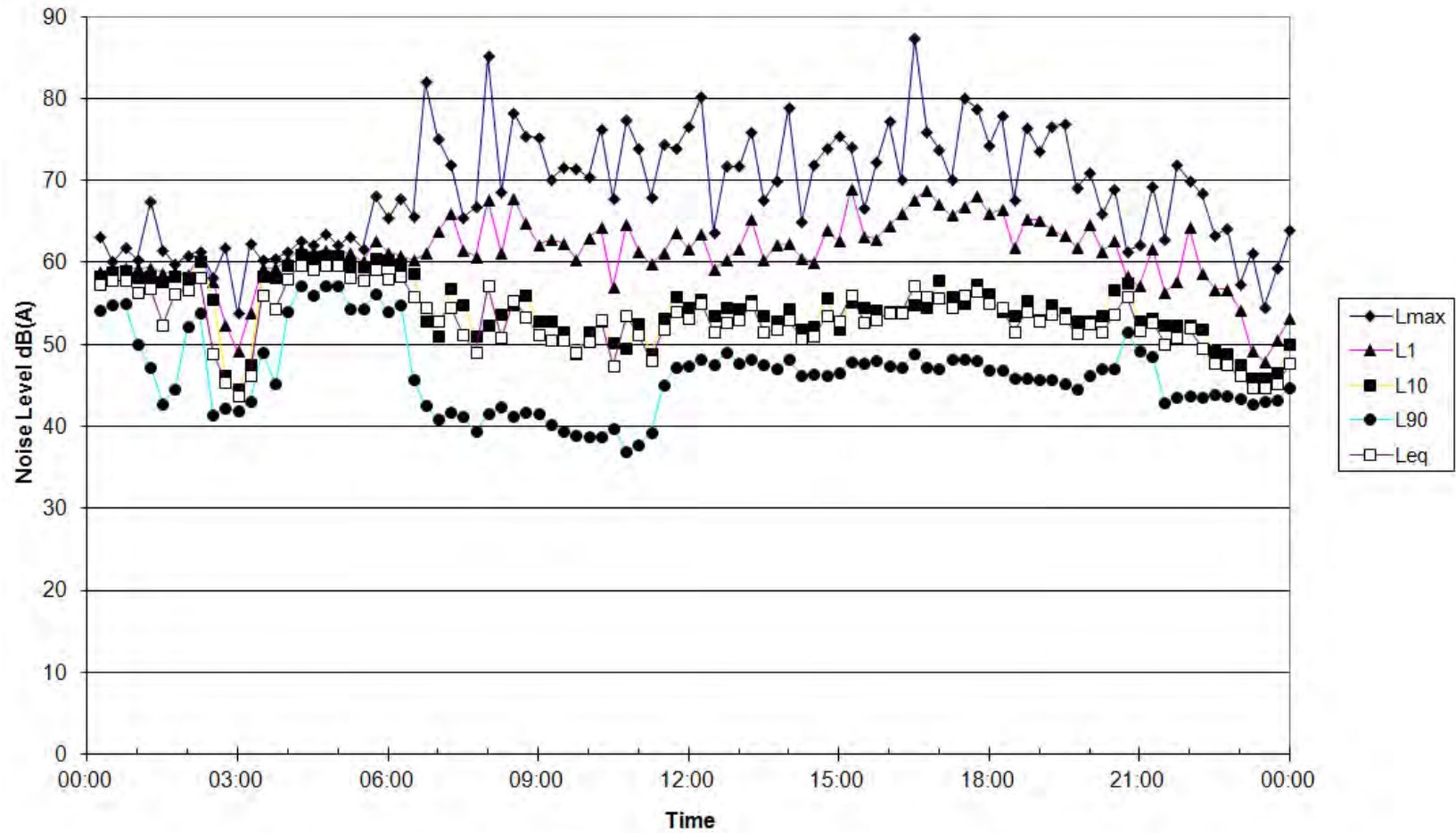
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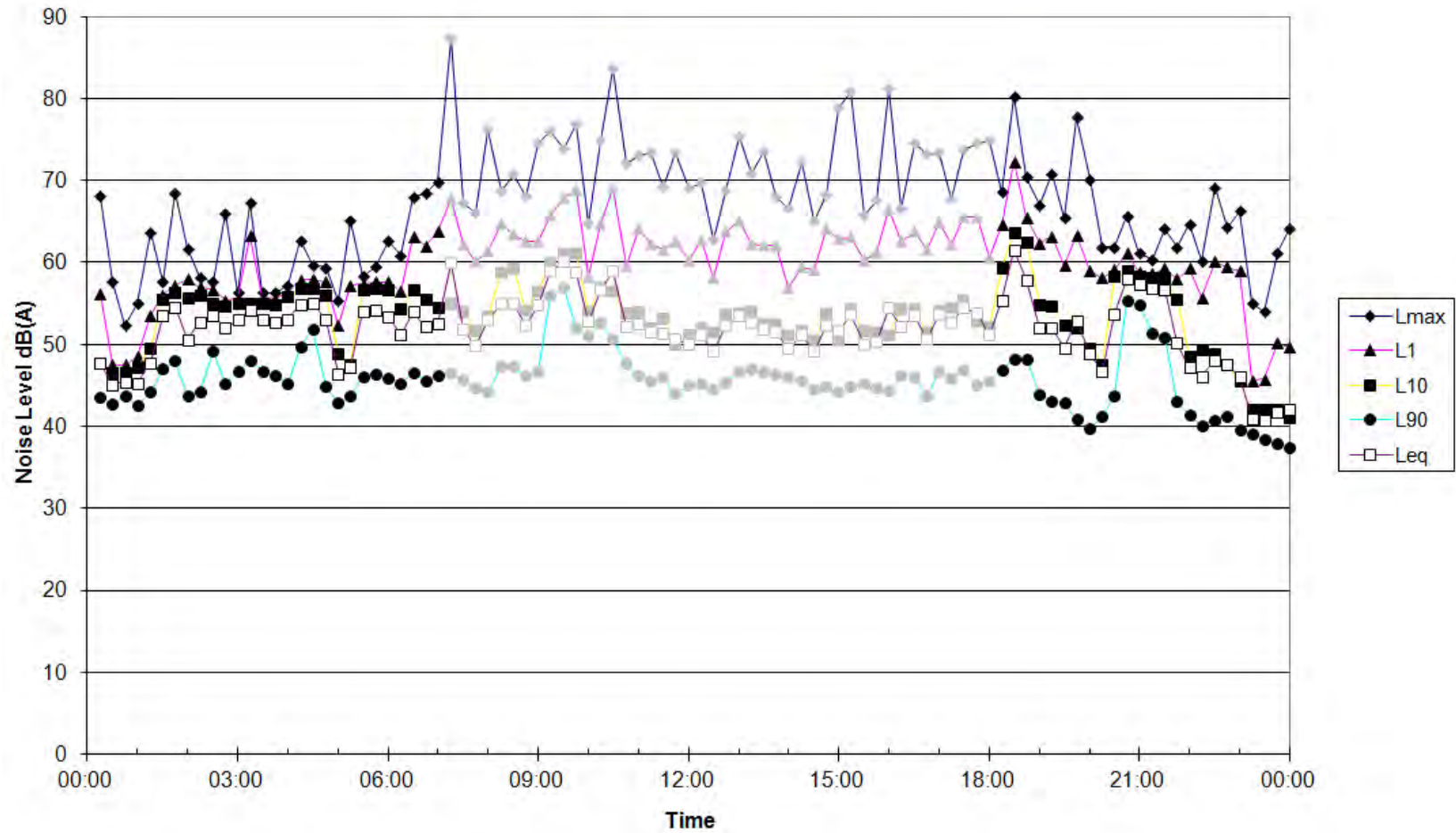
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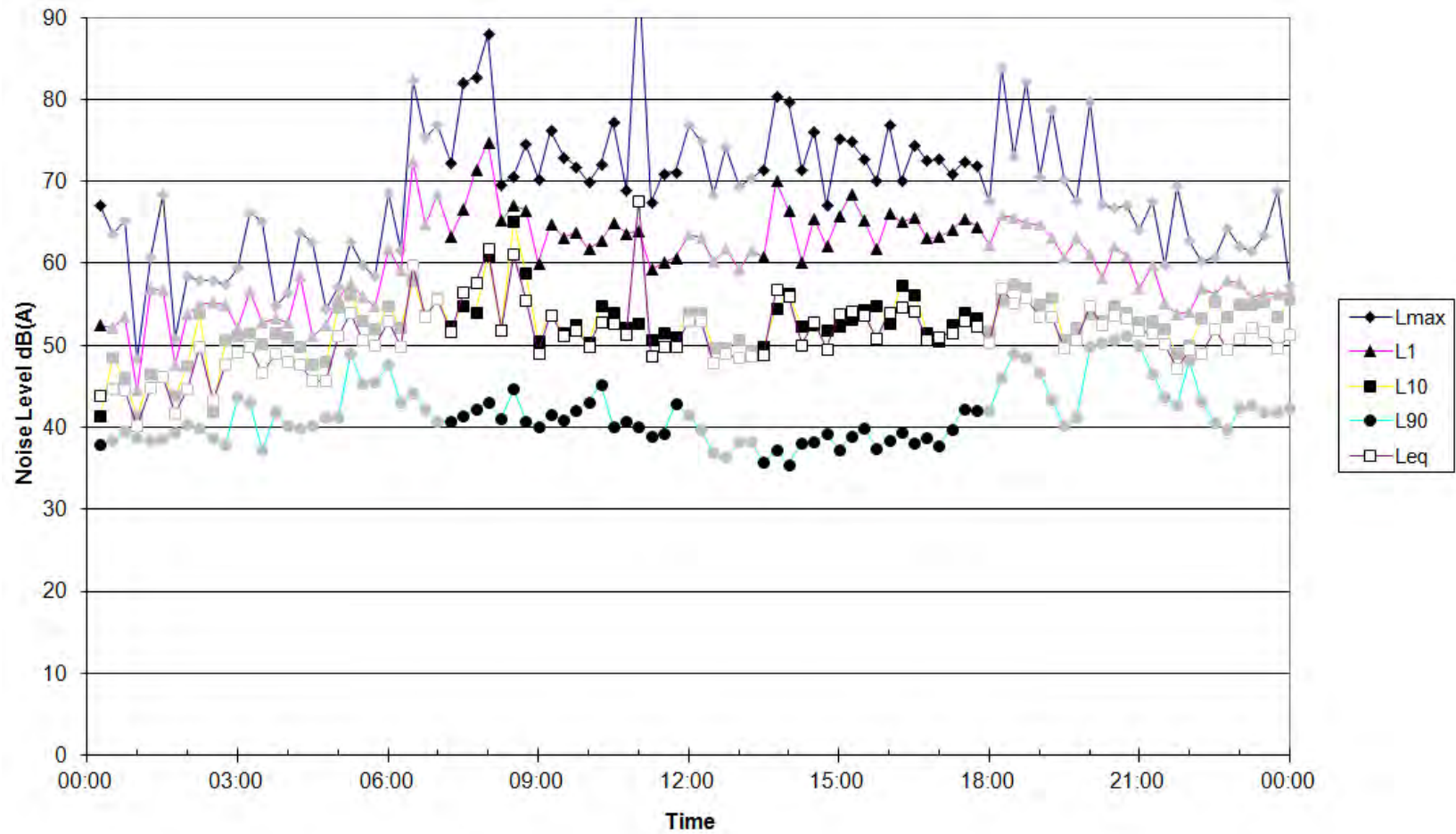
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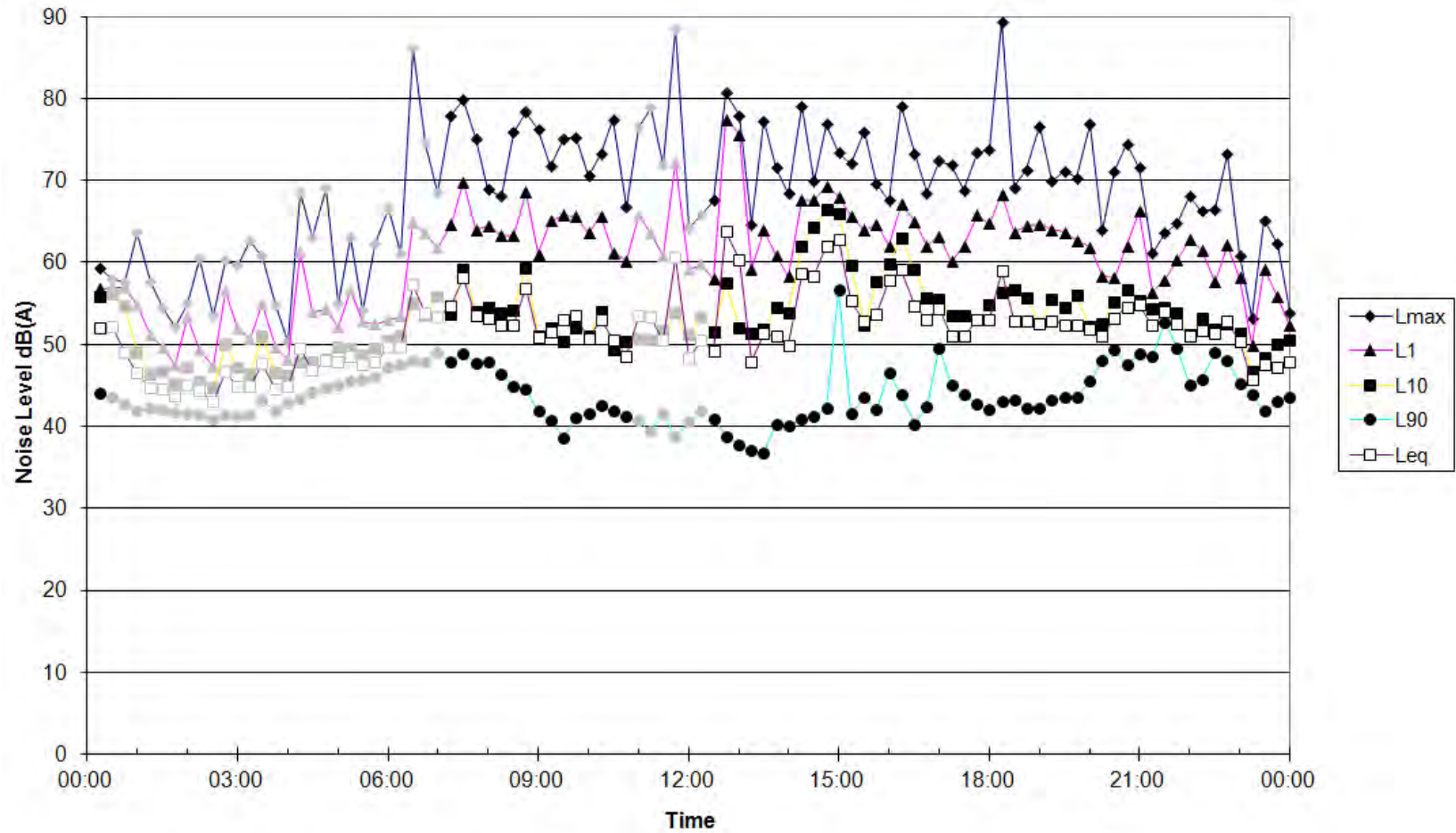
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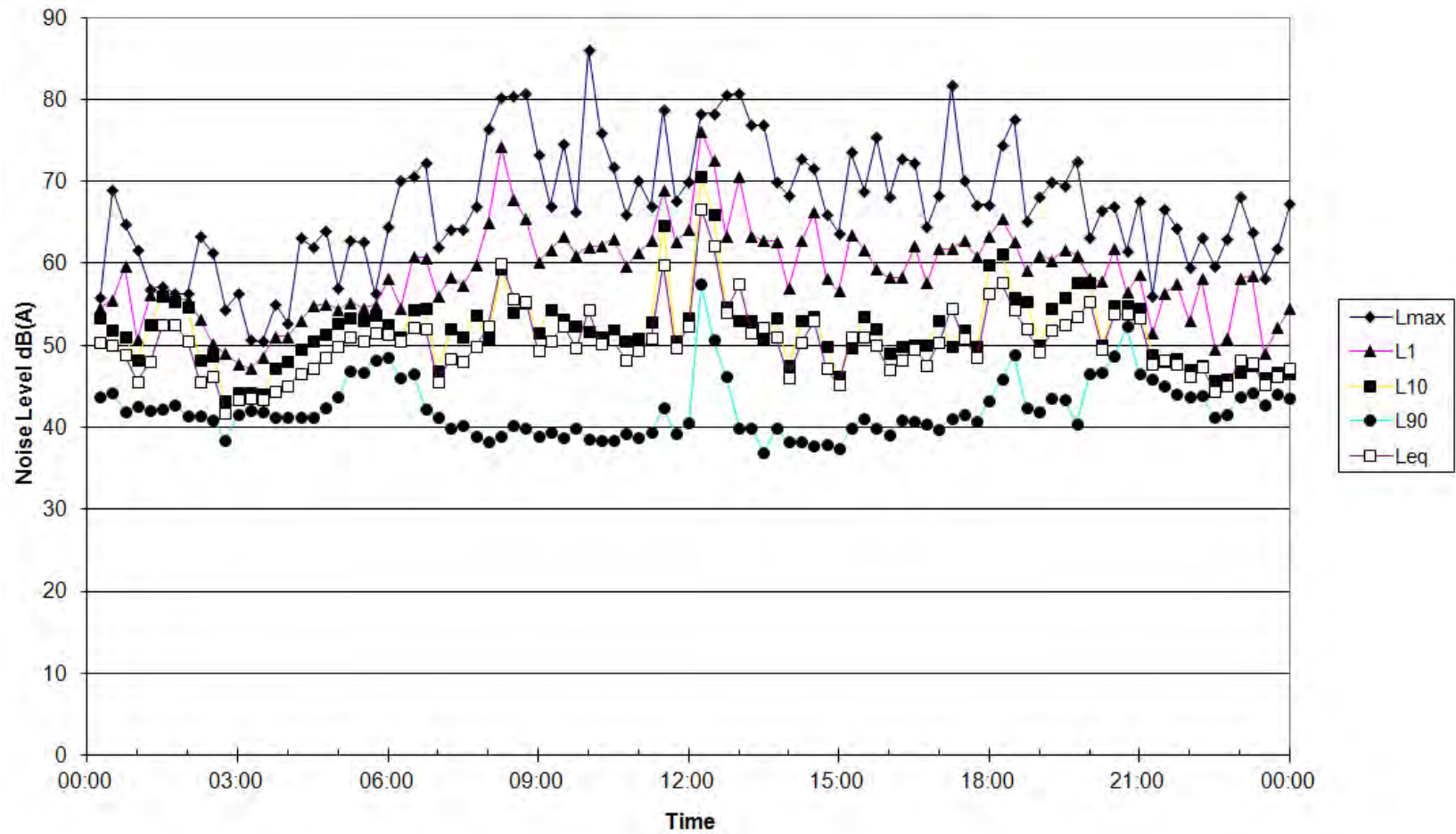
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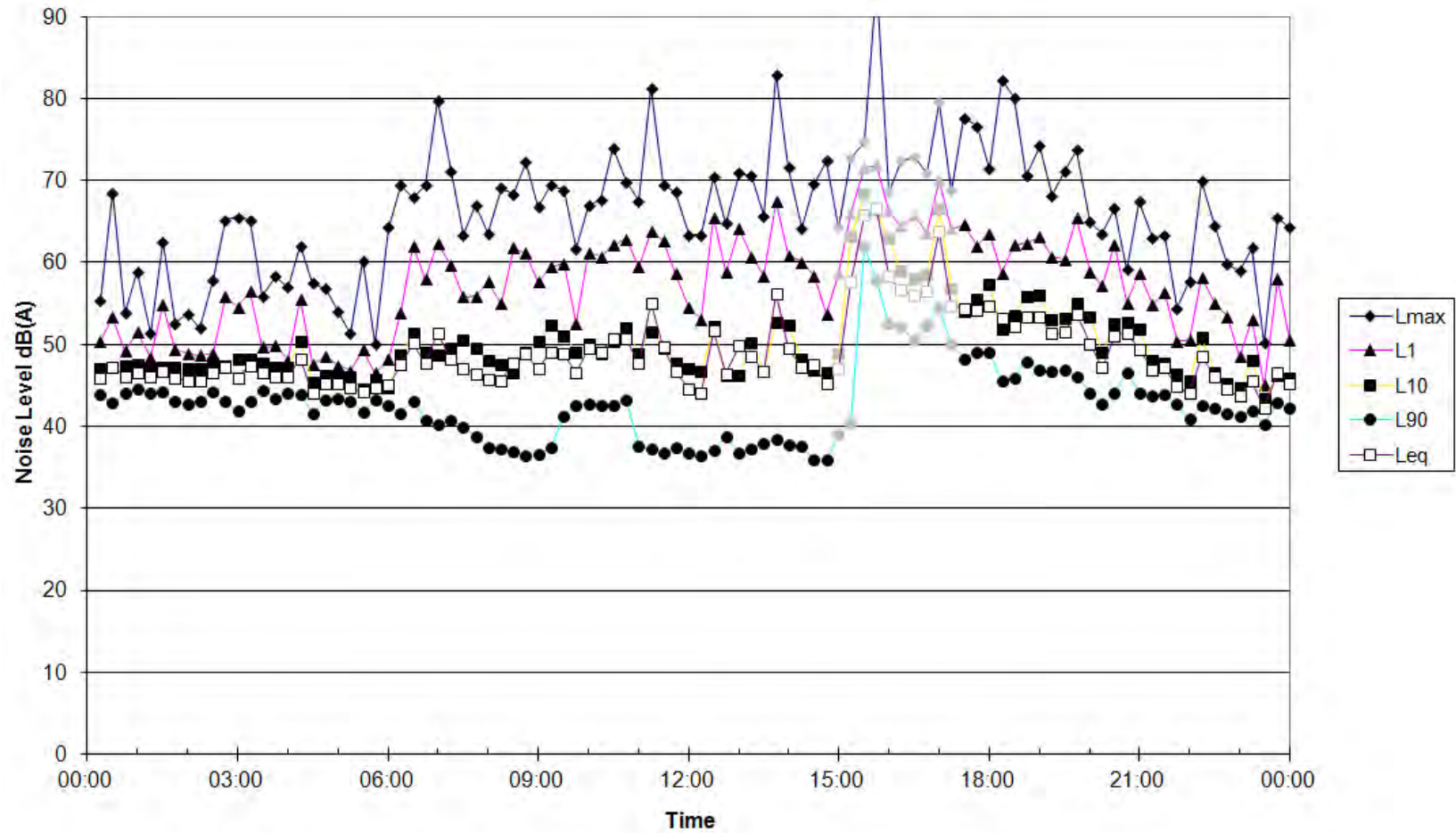
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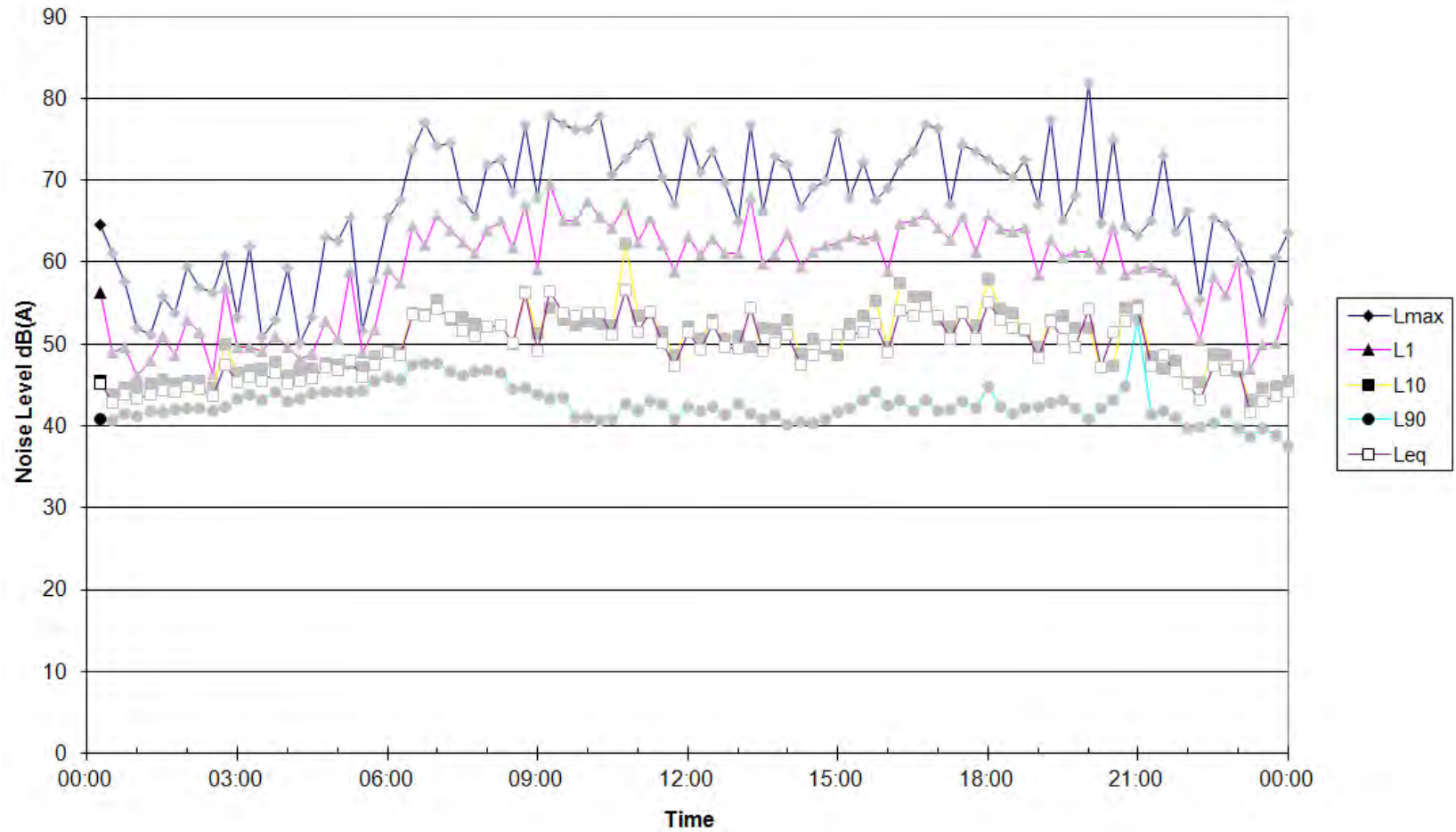
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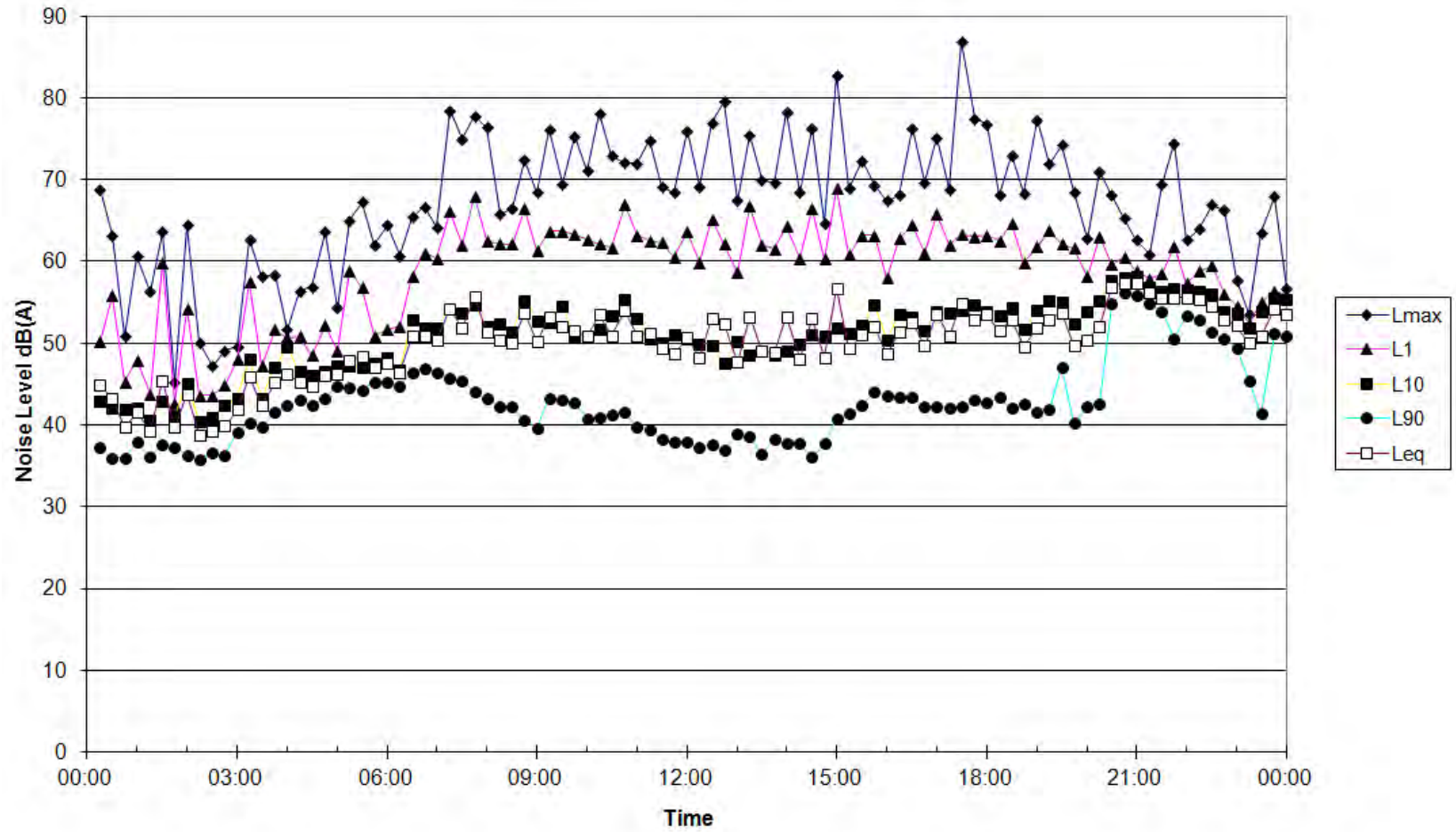
Measured Noise Levels
Receptor R2 - Sunday 01/03/2015



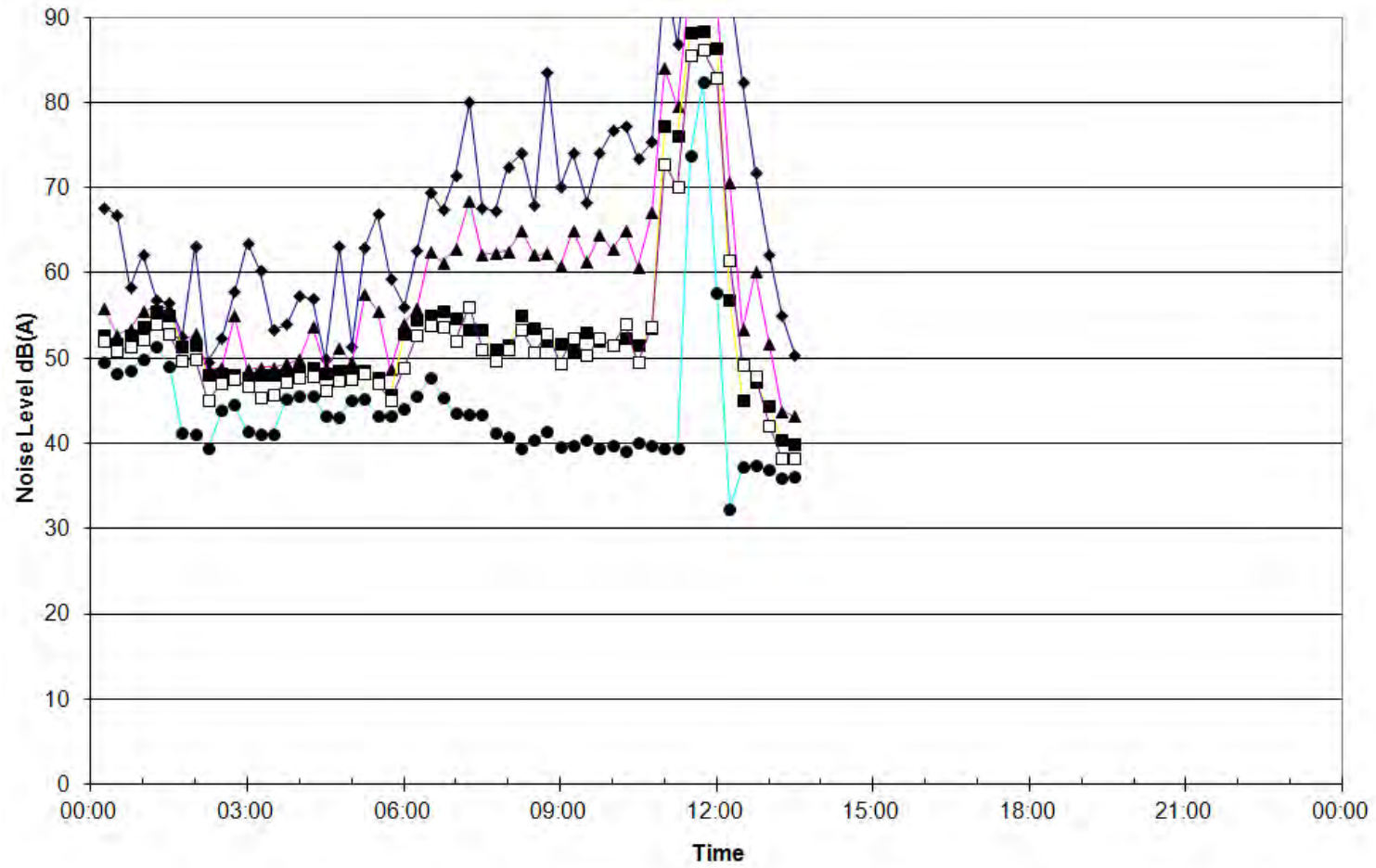
**Measured Noise Levels
Receptor R2 - Monday 02/03/2015**



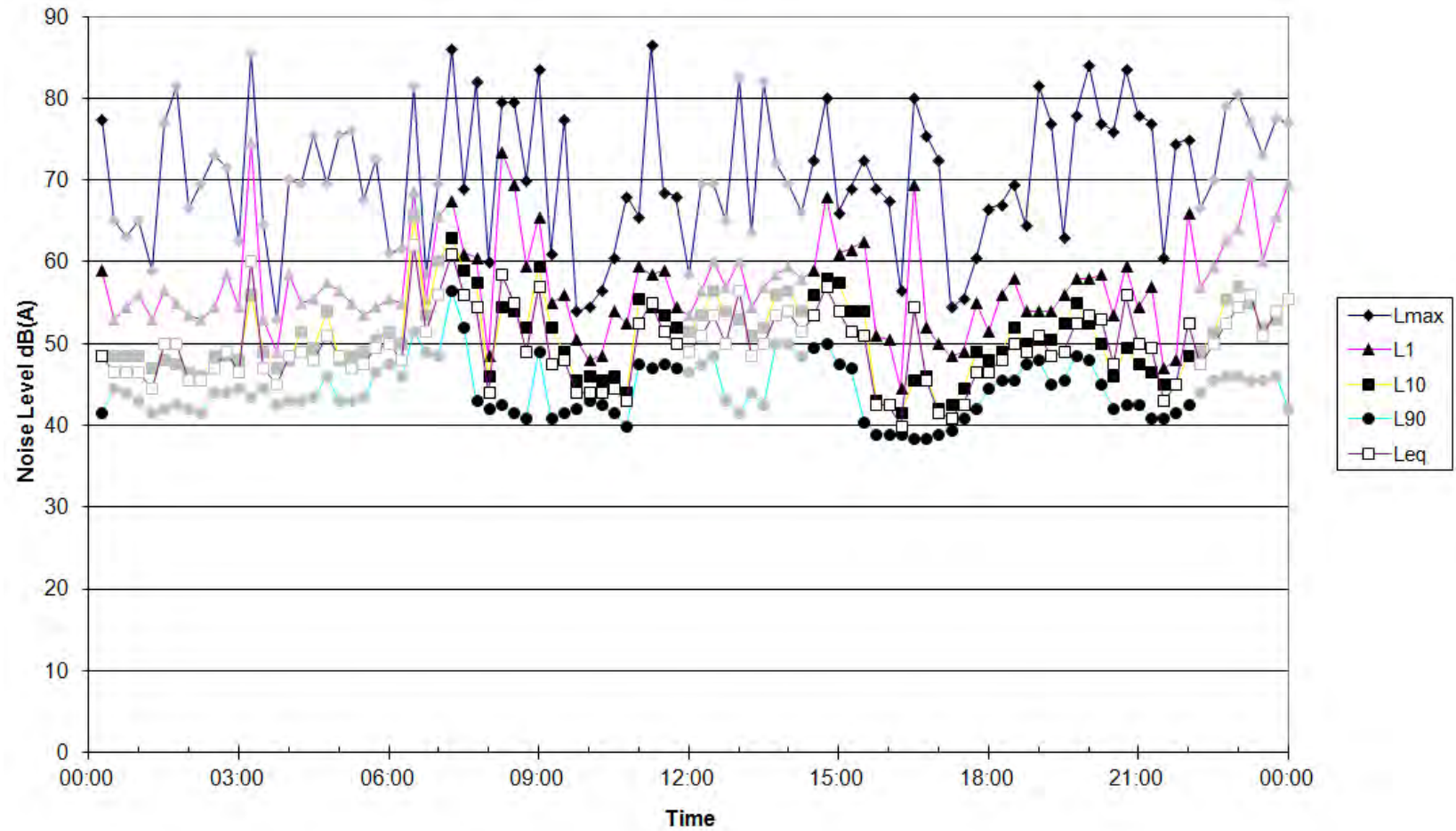
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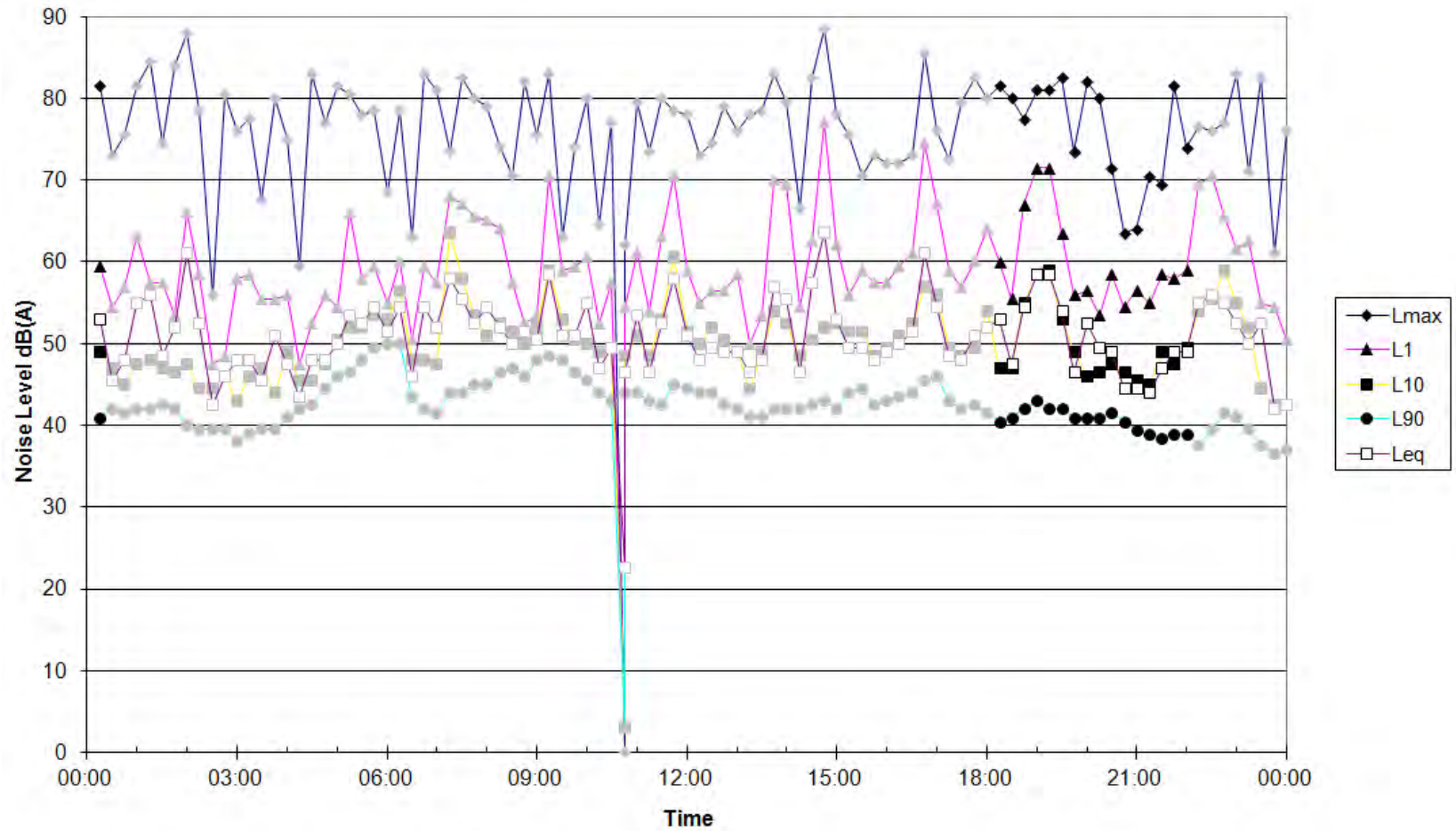
Measured Noise Levels
Receptor R2 - Wednesday 04/03/2015



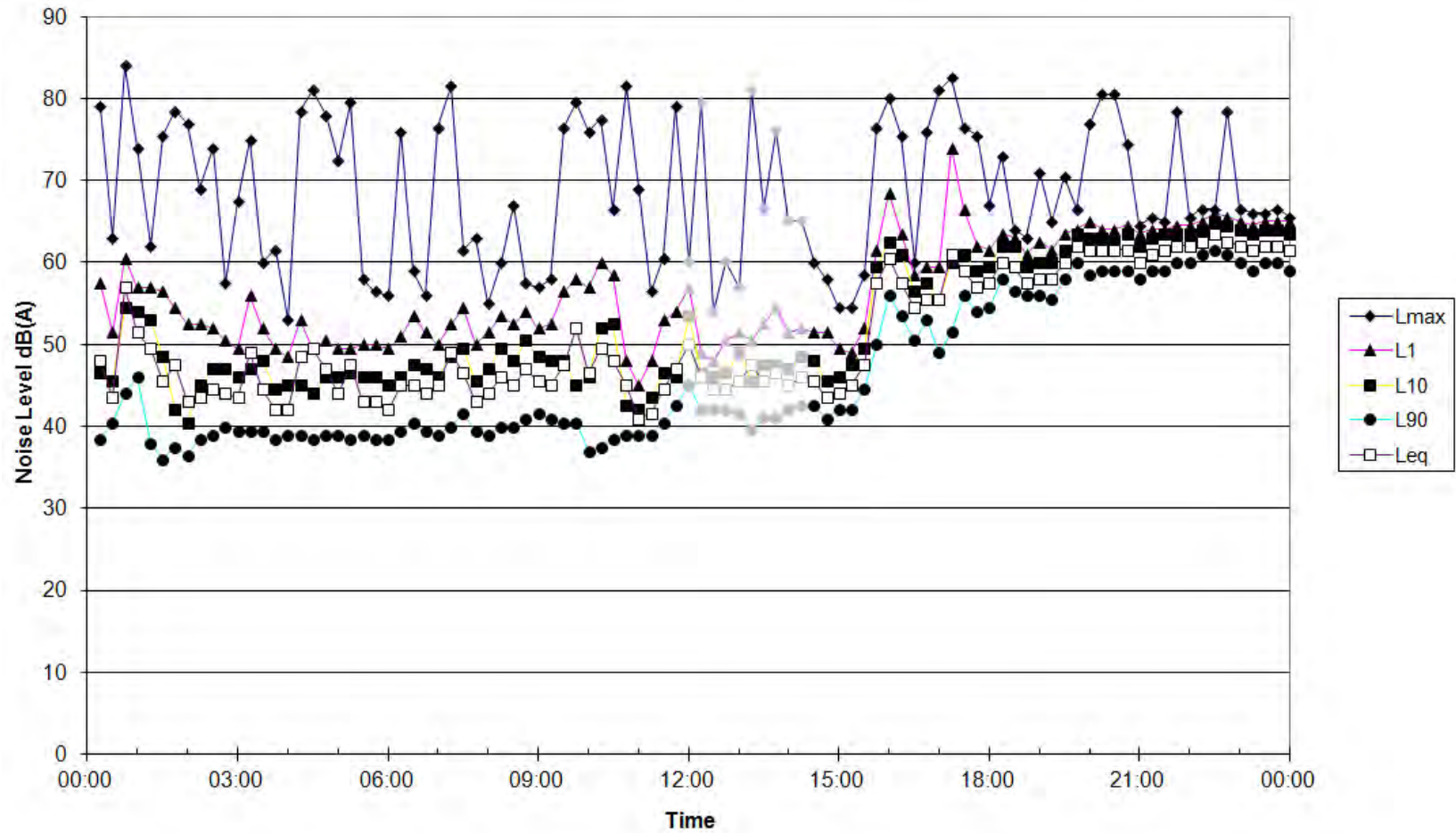
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Receptor R4 - Saturday 21/02/2015



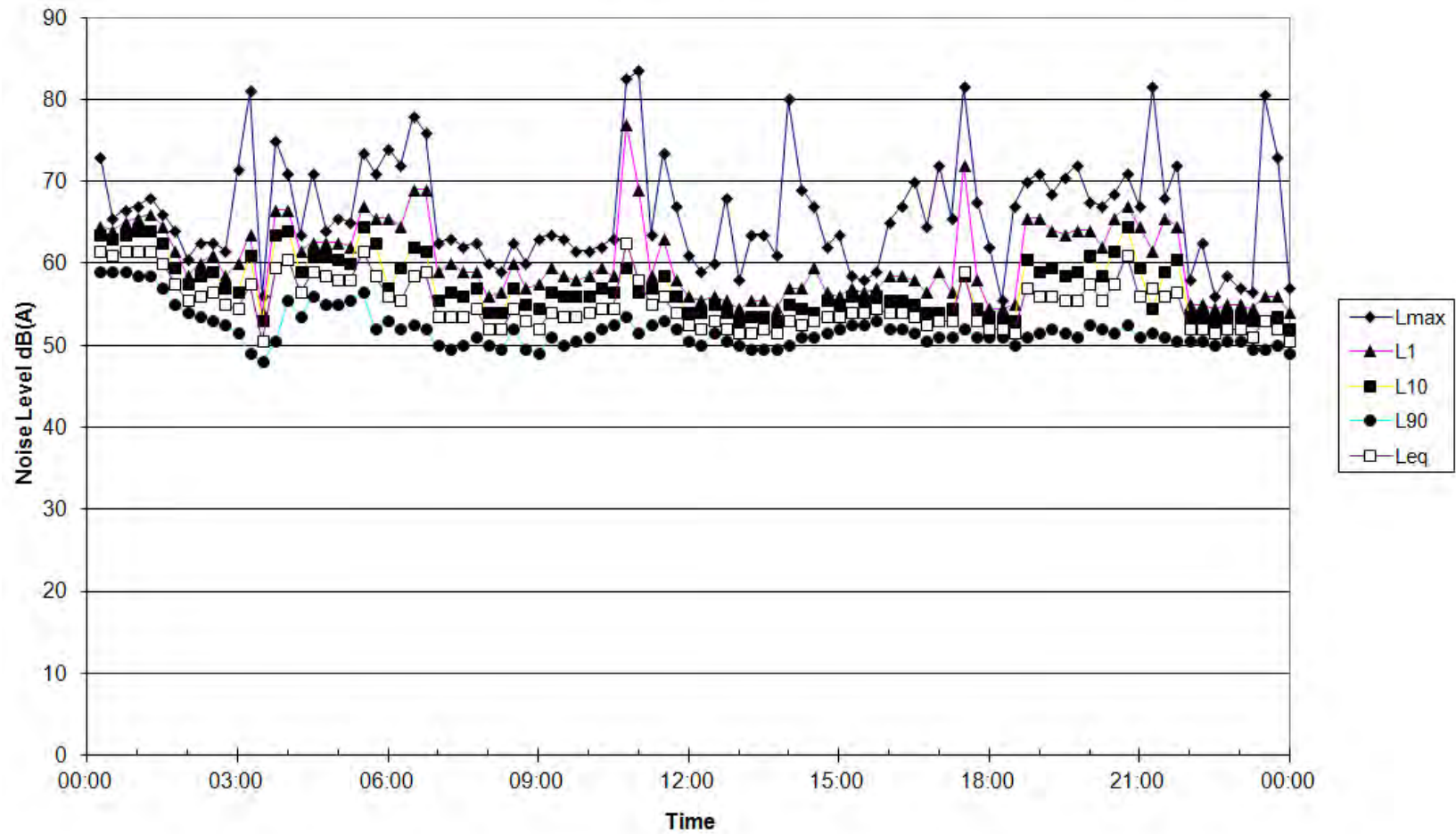
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Receptor R4 - Sunday 22/02/2015



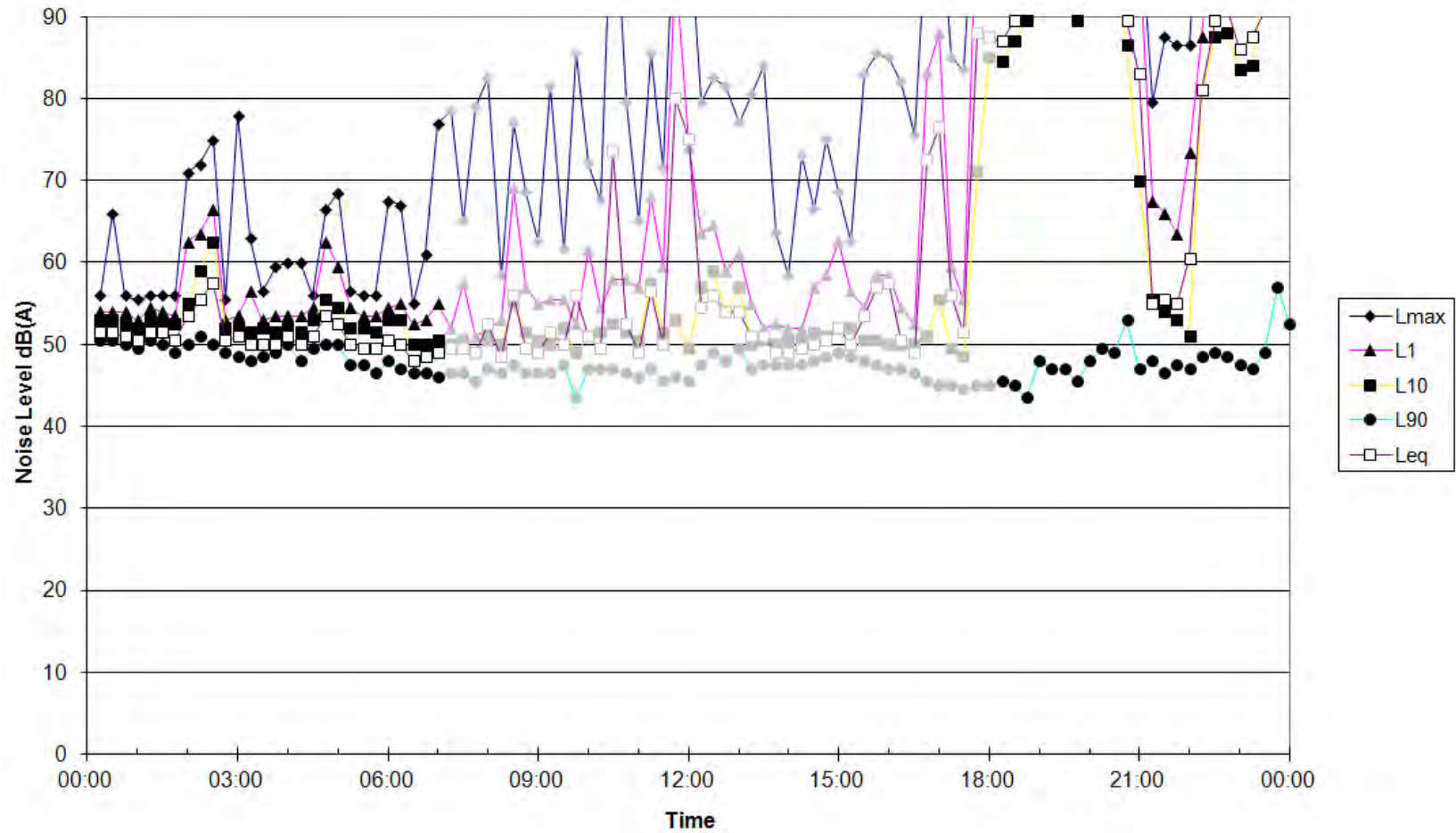
Measured Noise Levels
Receptor R4 - Monday 23/02/2015



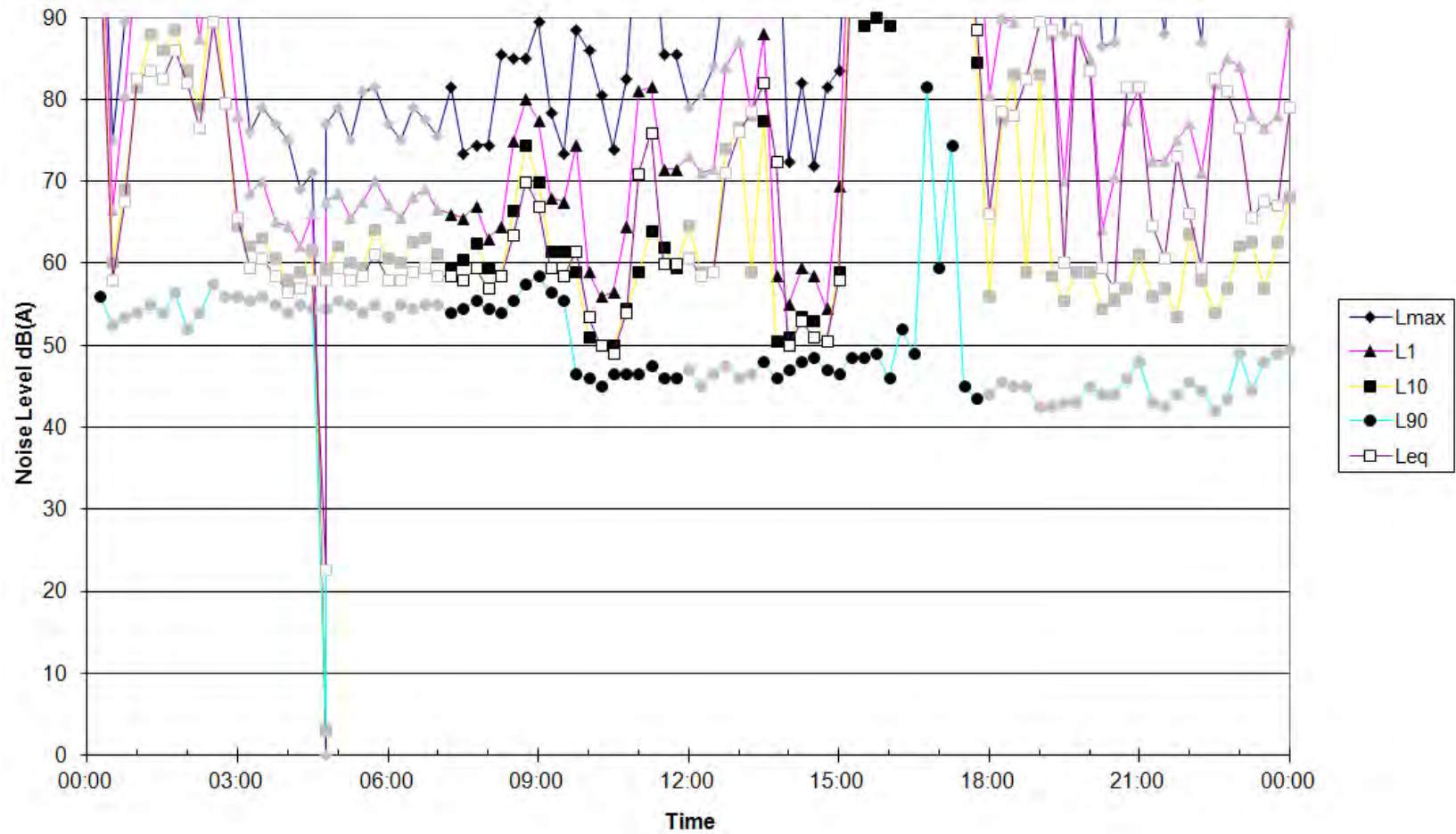
Measured Noise Levels
Receptor R4 - Tuesday 24/02/2015



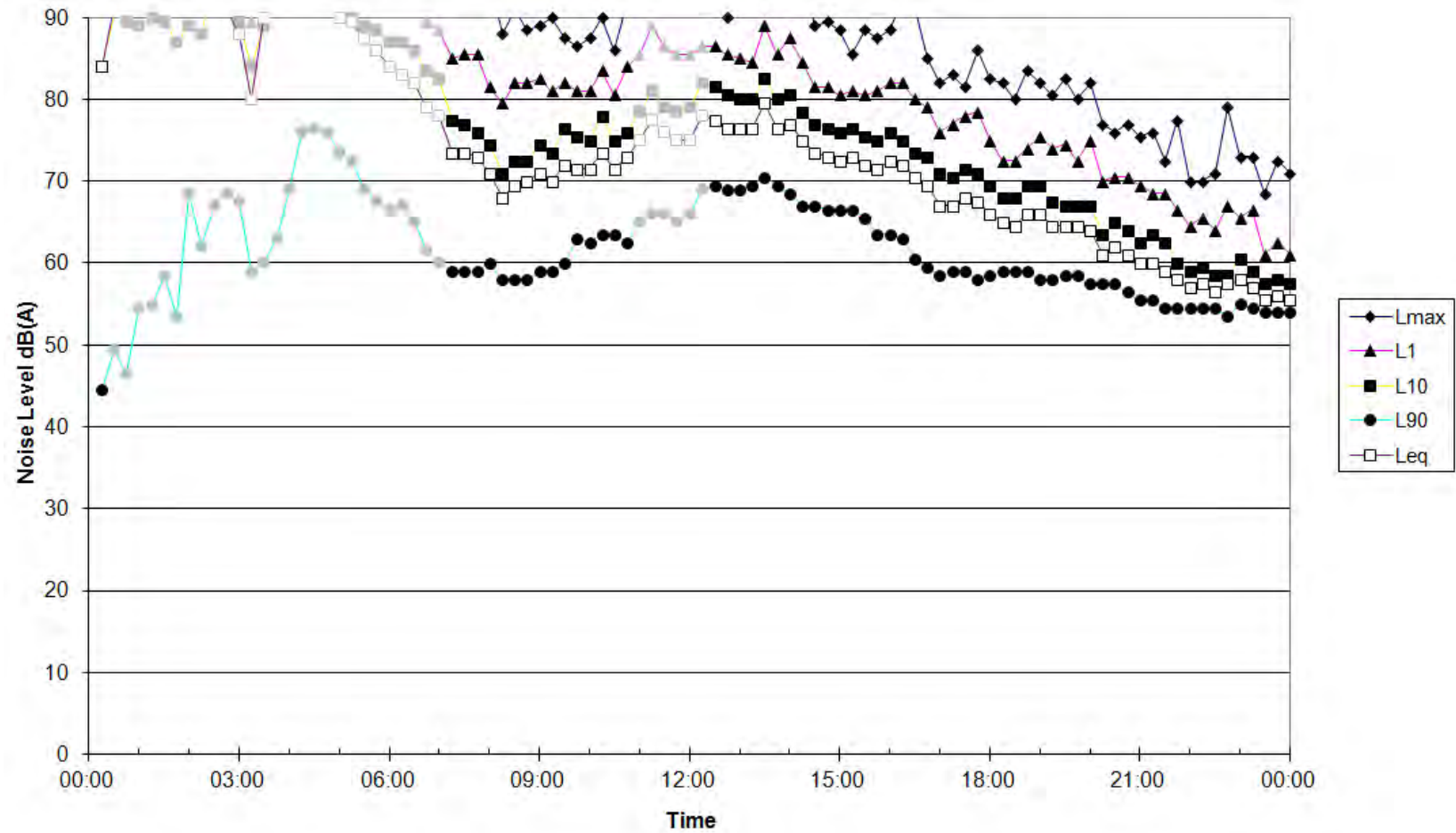
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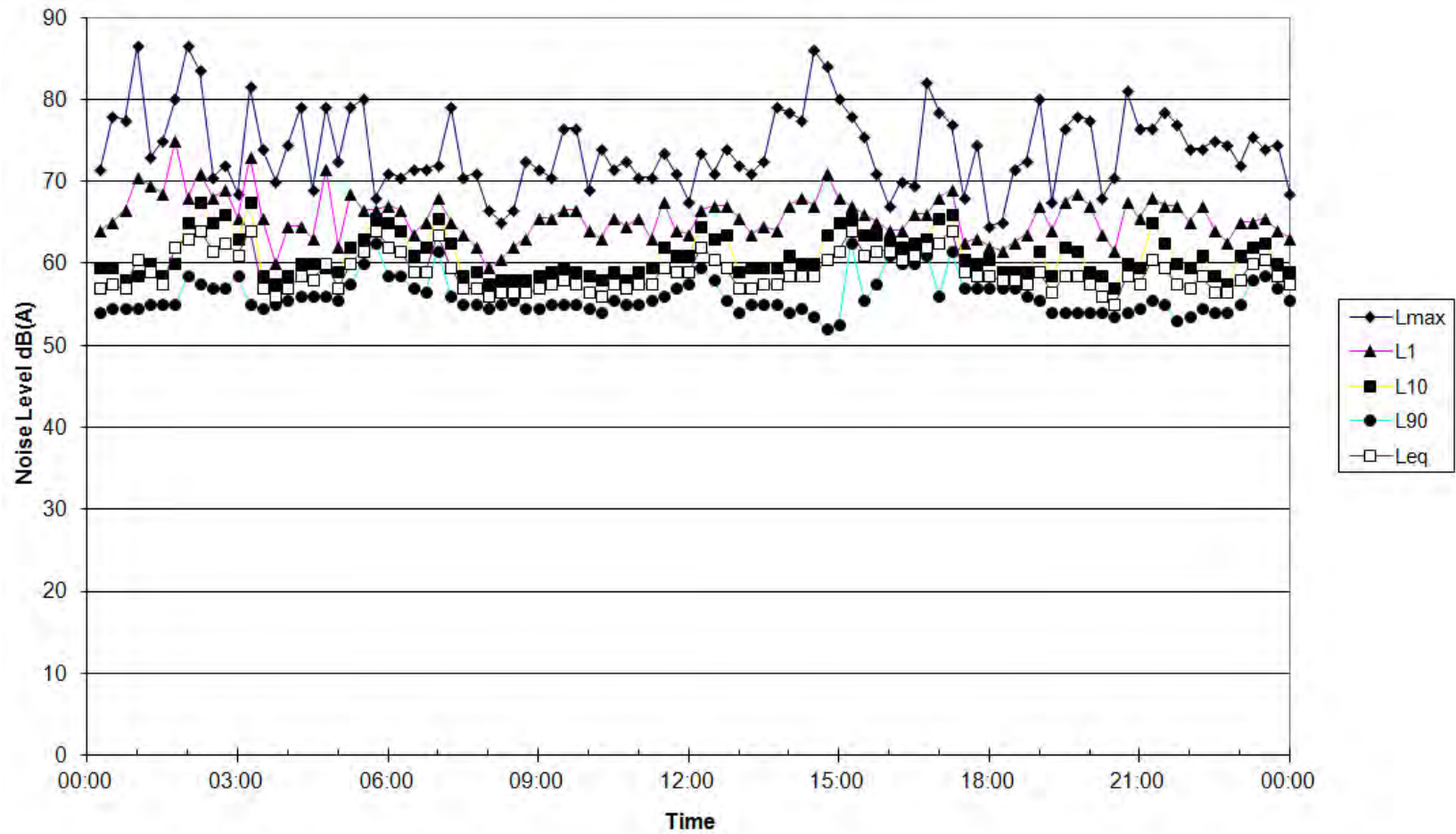
Measured Noise Levels
Receptor R4 - Thursday 26/02/2015



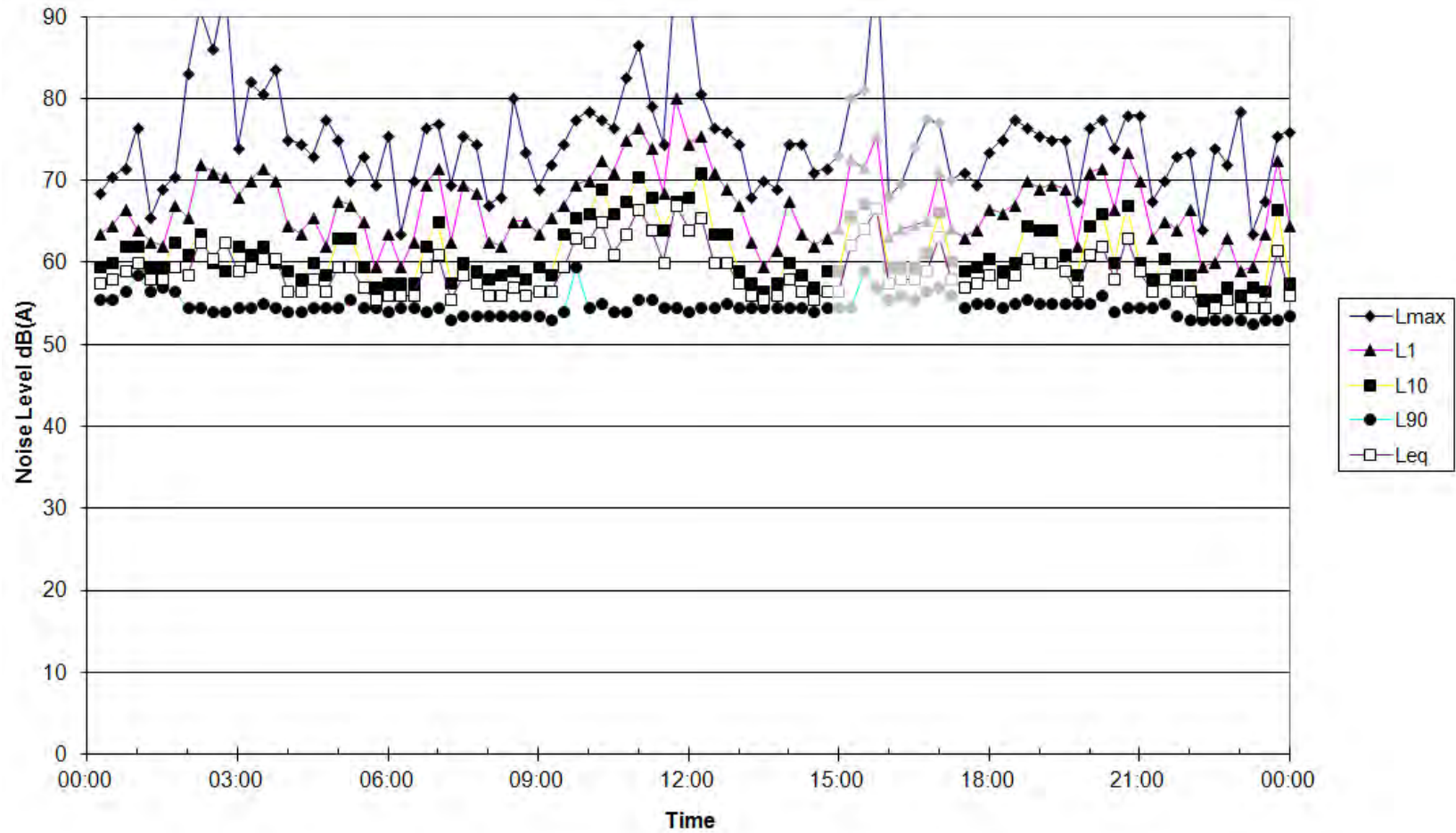
Measured Noise Levels
Receptor R4 - Friday 27/02/2015



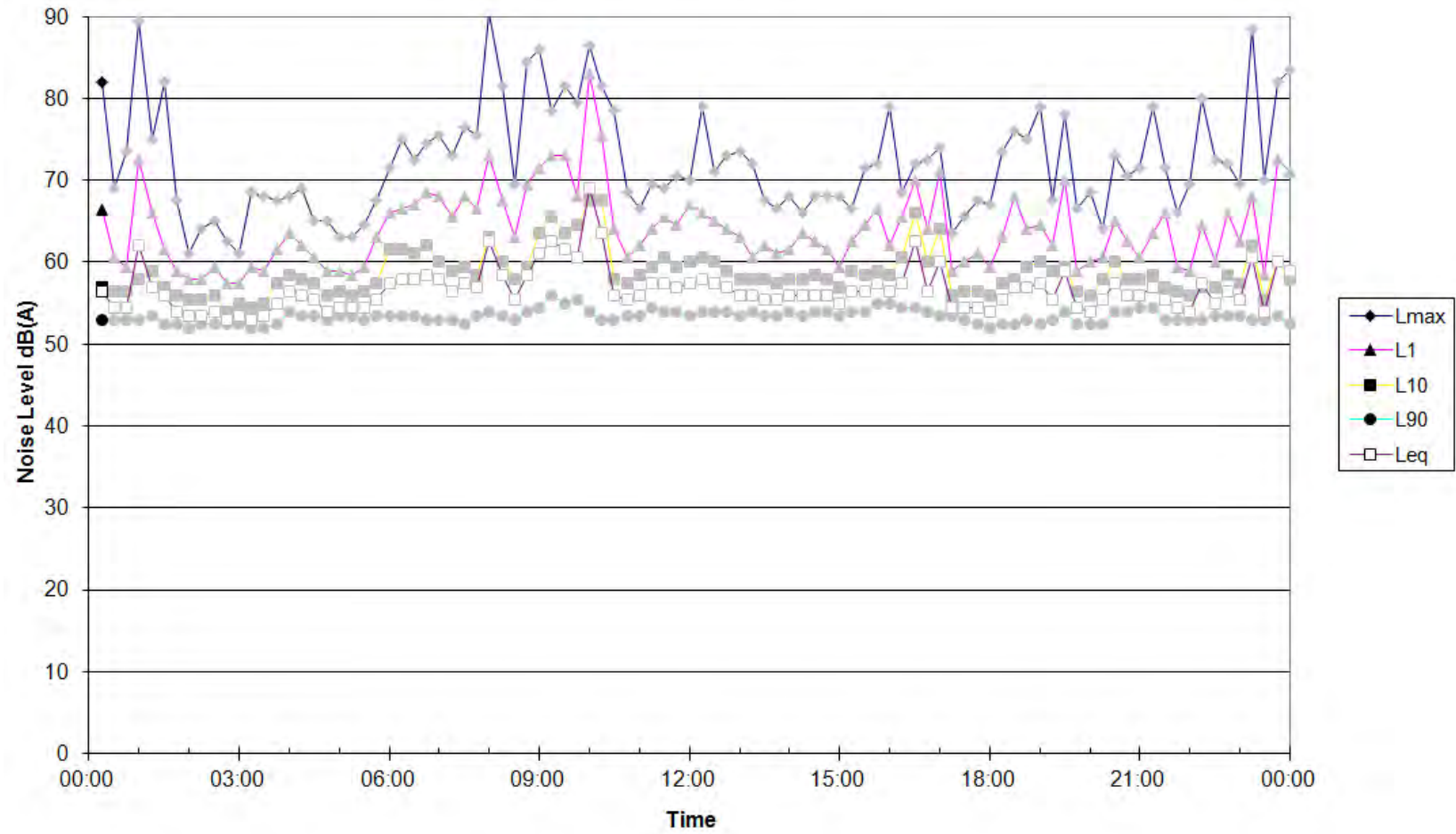
Measured Noise Levels
Receptor R4 - Saturday 28/02/2015



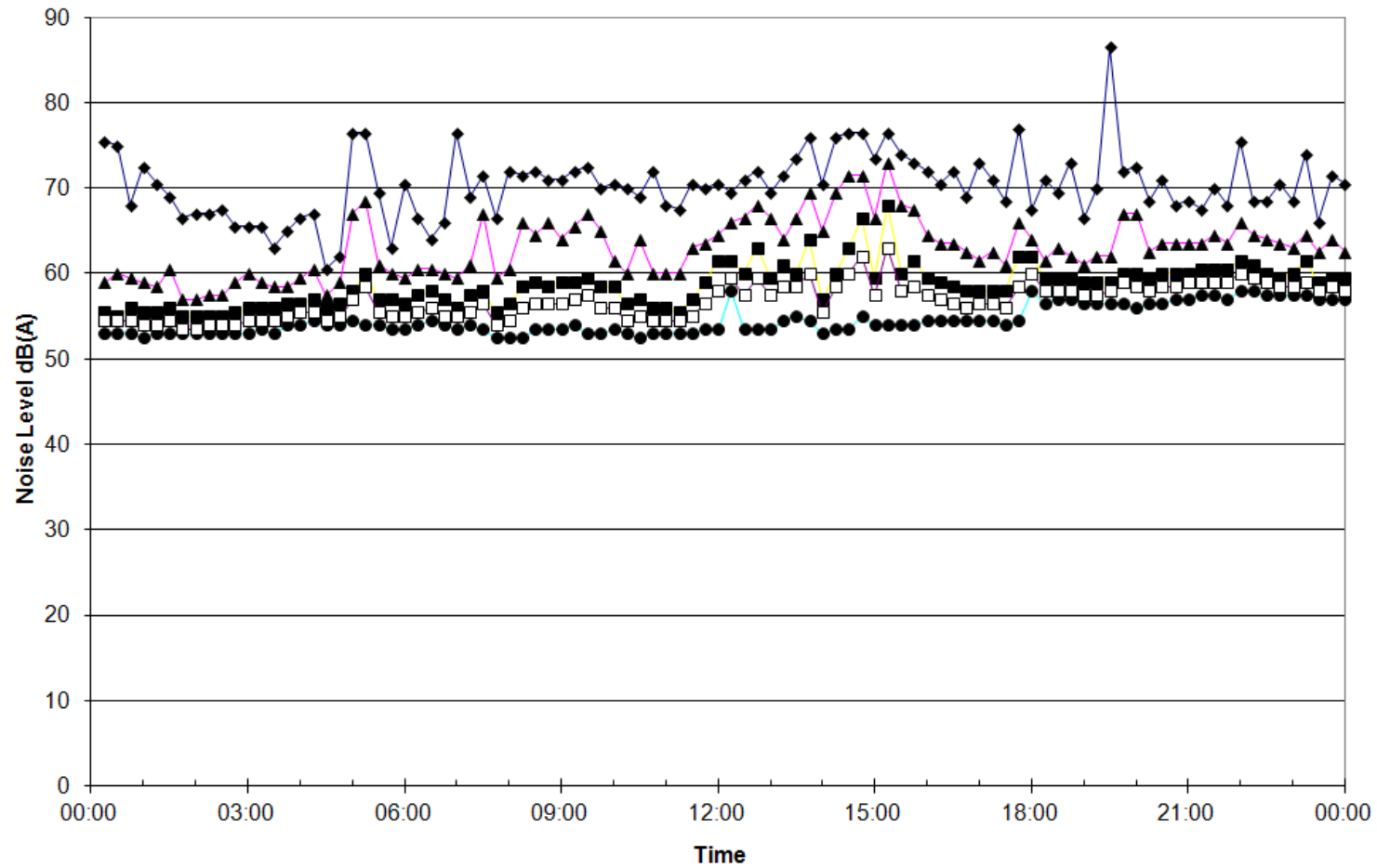
Measured Noise Levels
Receptor R4 - Sunday 01/03/2015



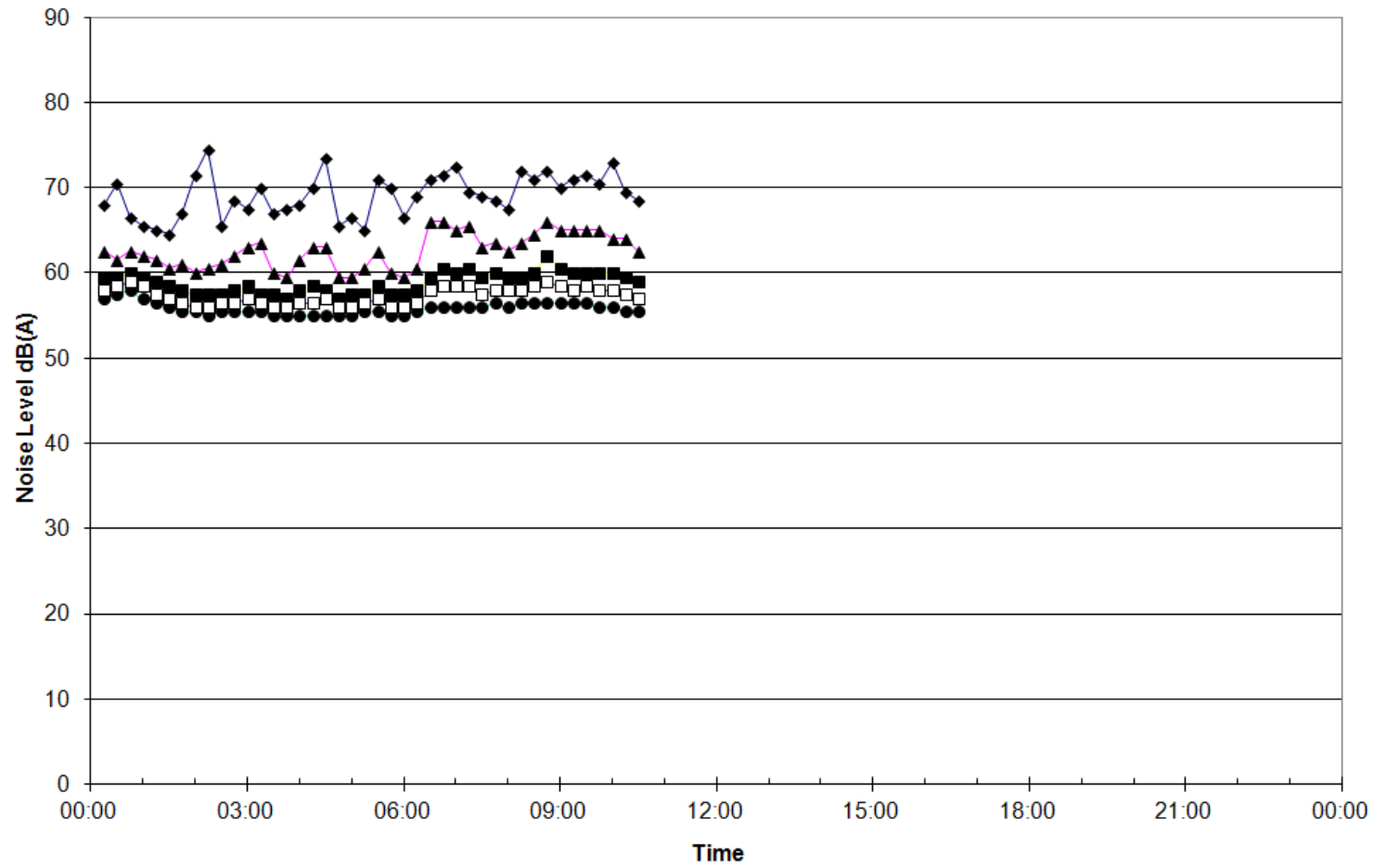
Measured Noise Levels
Receptor R4 - Monday 02/03/2015



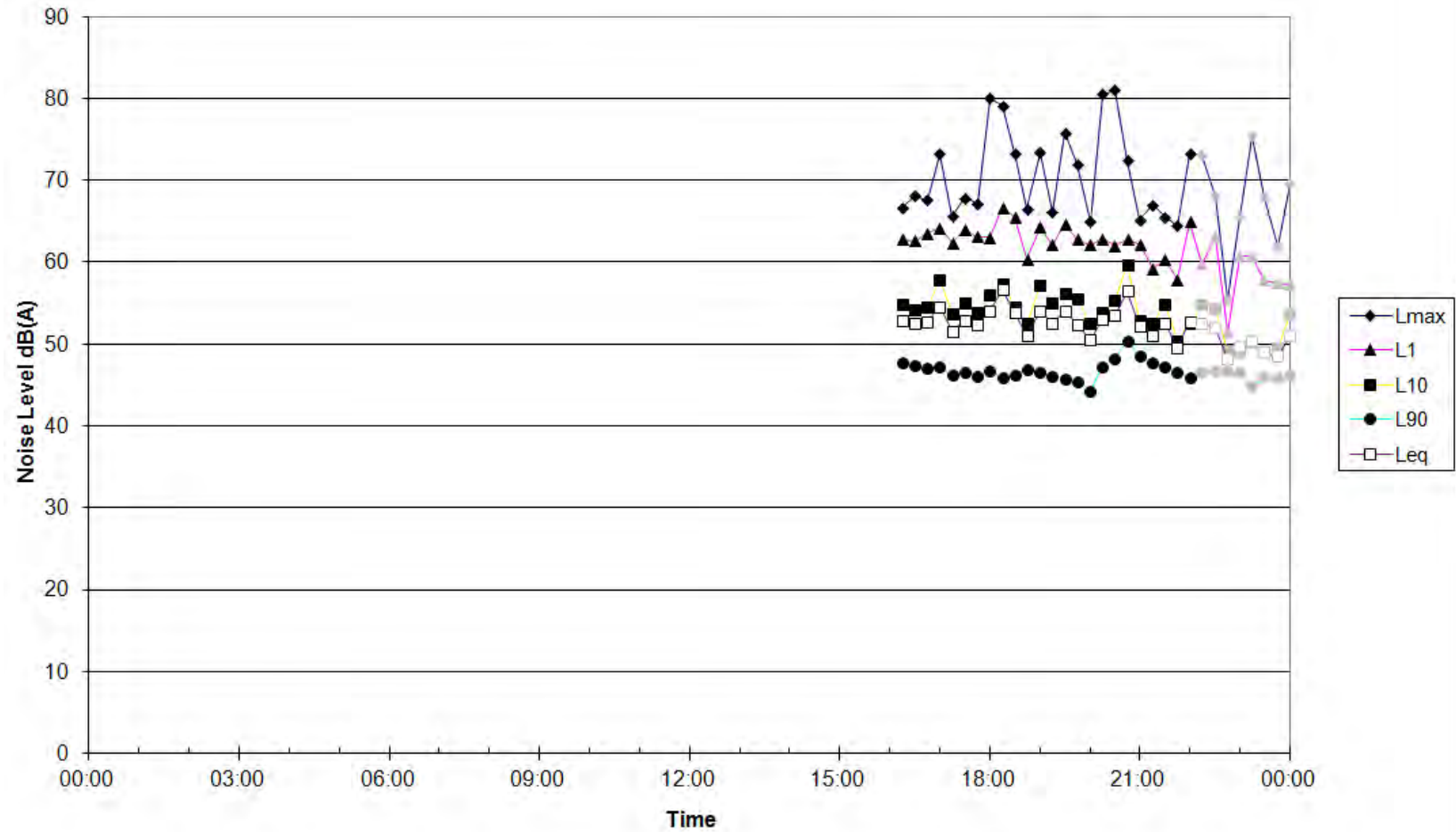
Measured Noise Levels
Receptor R4 - Tuesday 03/03/2015



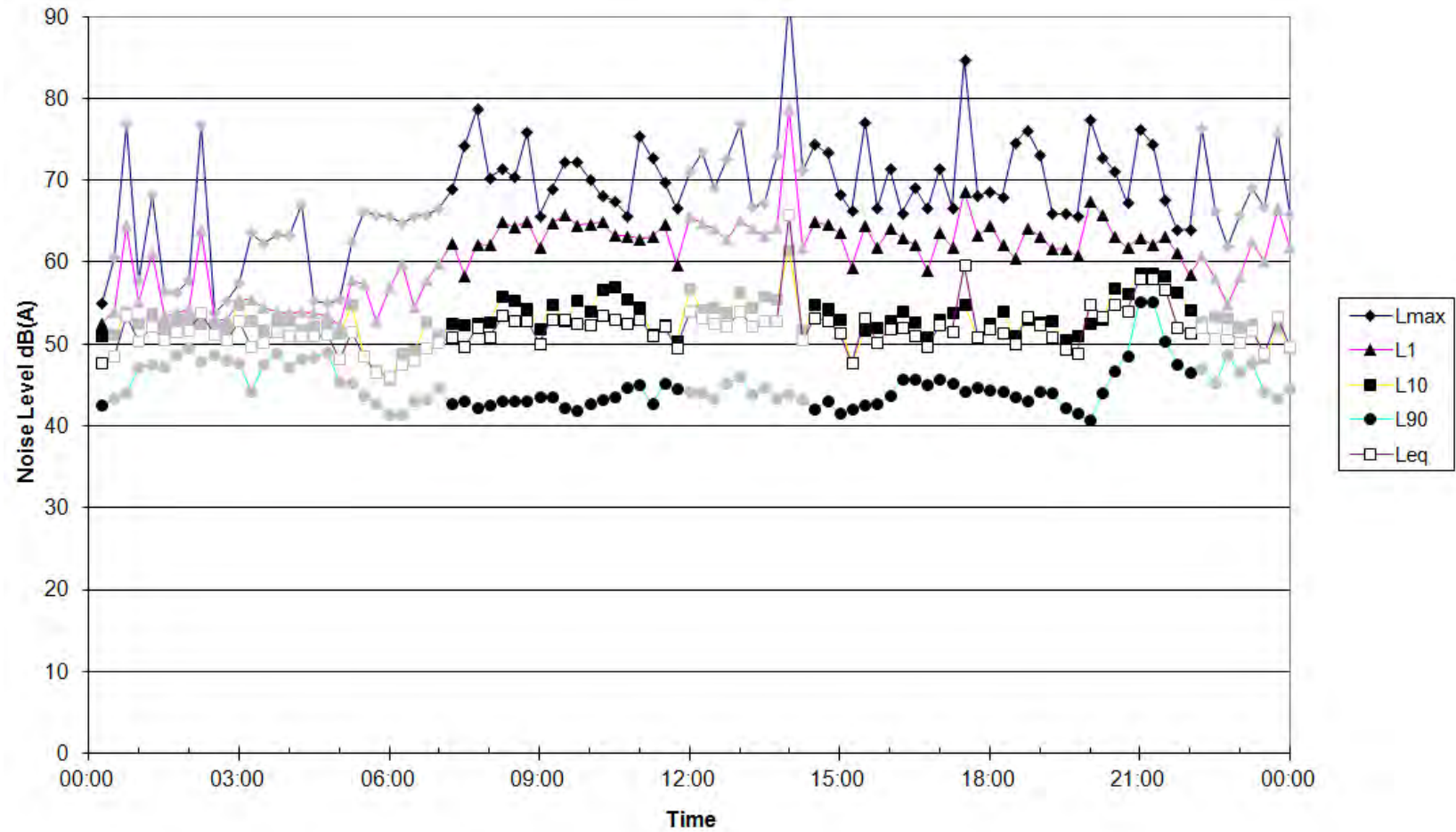
Measured Noise Levels
Receptor R4 - Wednesday 04/03/2015



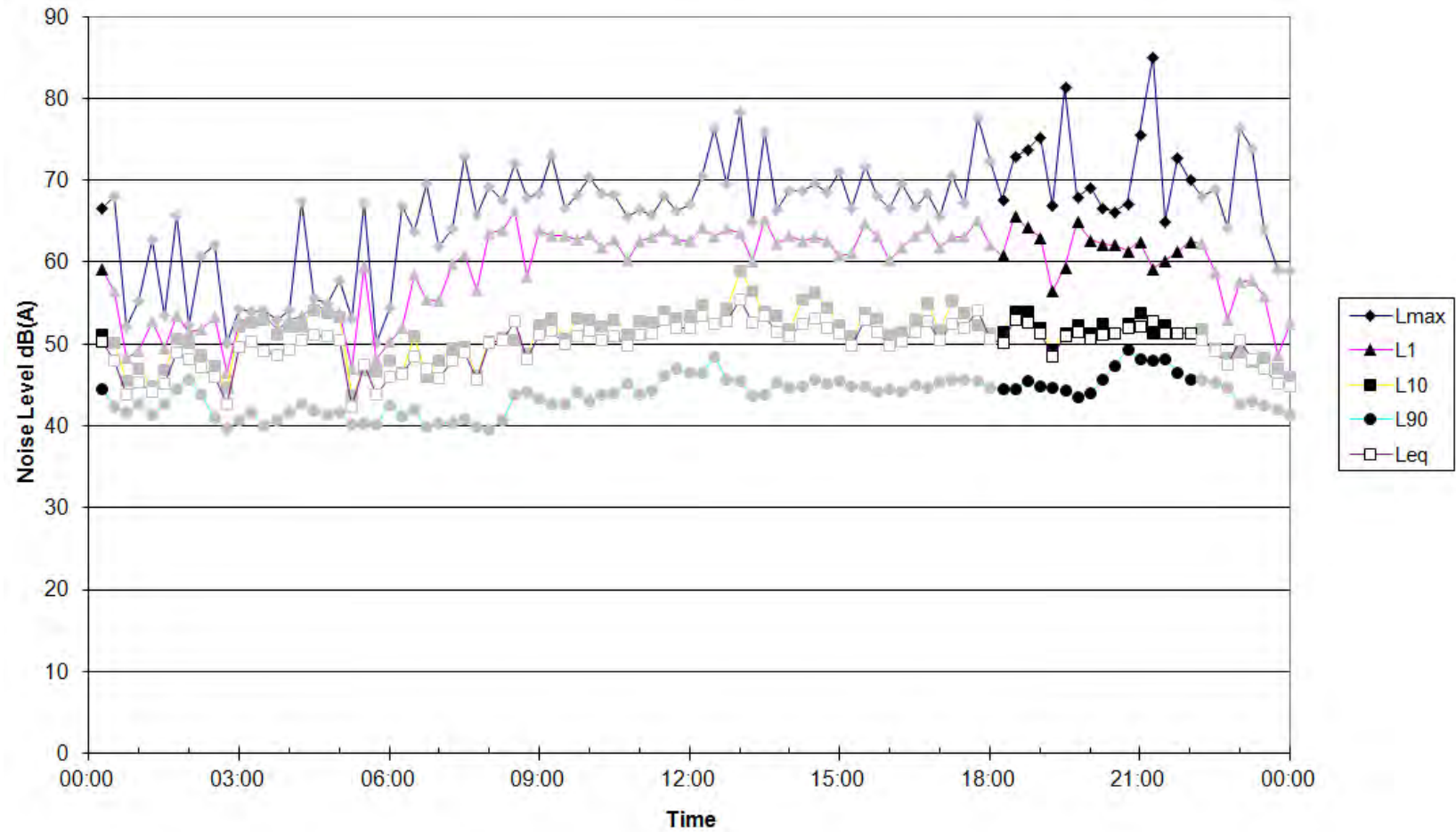
Measured Noise Levels
Receptor R9 - Friday 20/02/2015



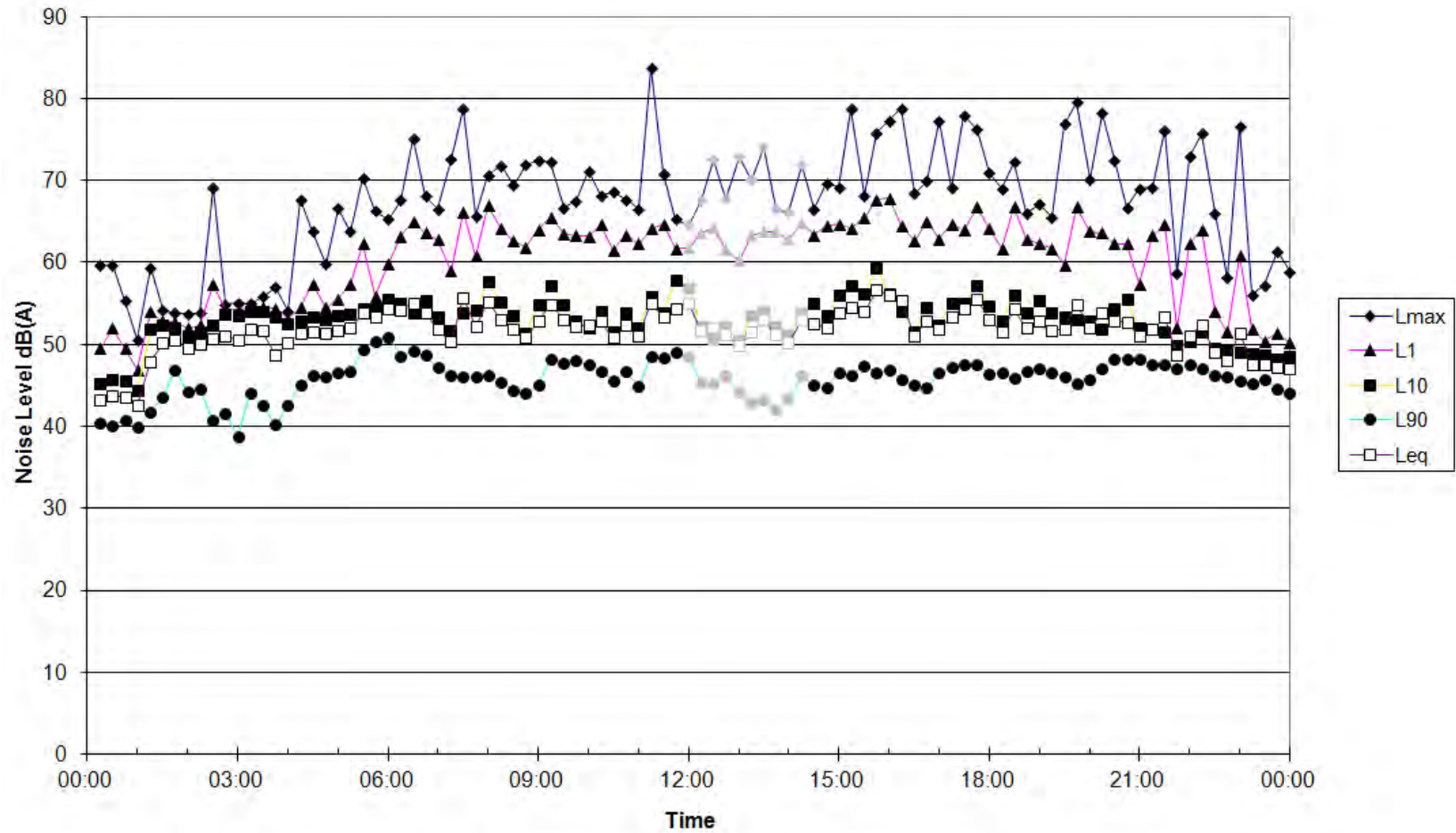
Measured Noise Levels
Receptor R9 - Saturday 21/02/2015



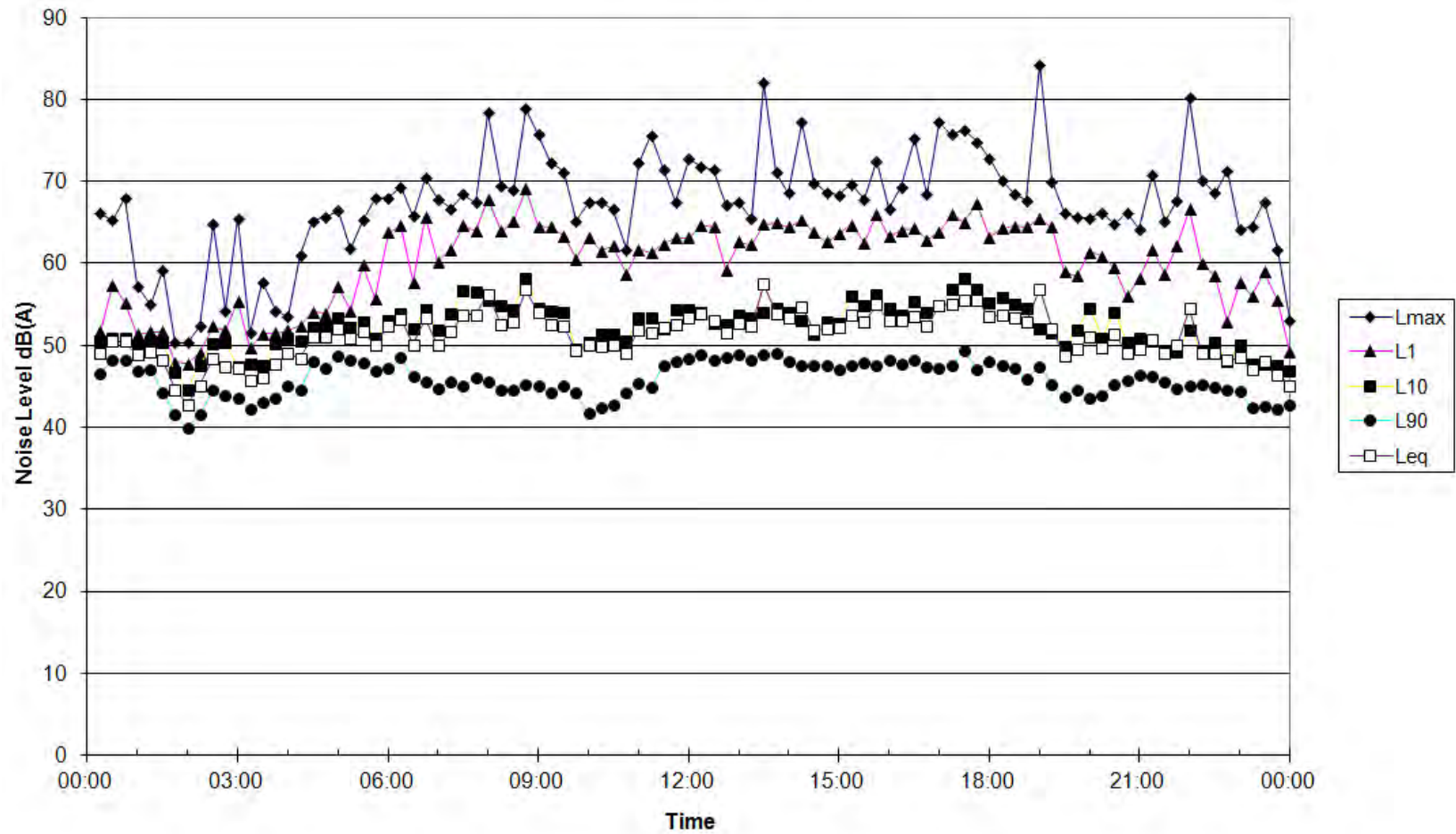
Measured Noise Levels
Receptor R9 - Sunday 22/02/2015



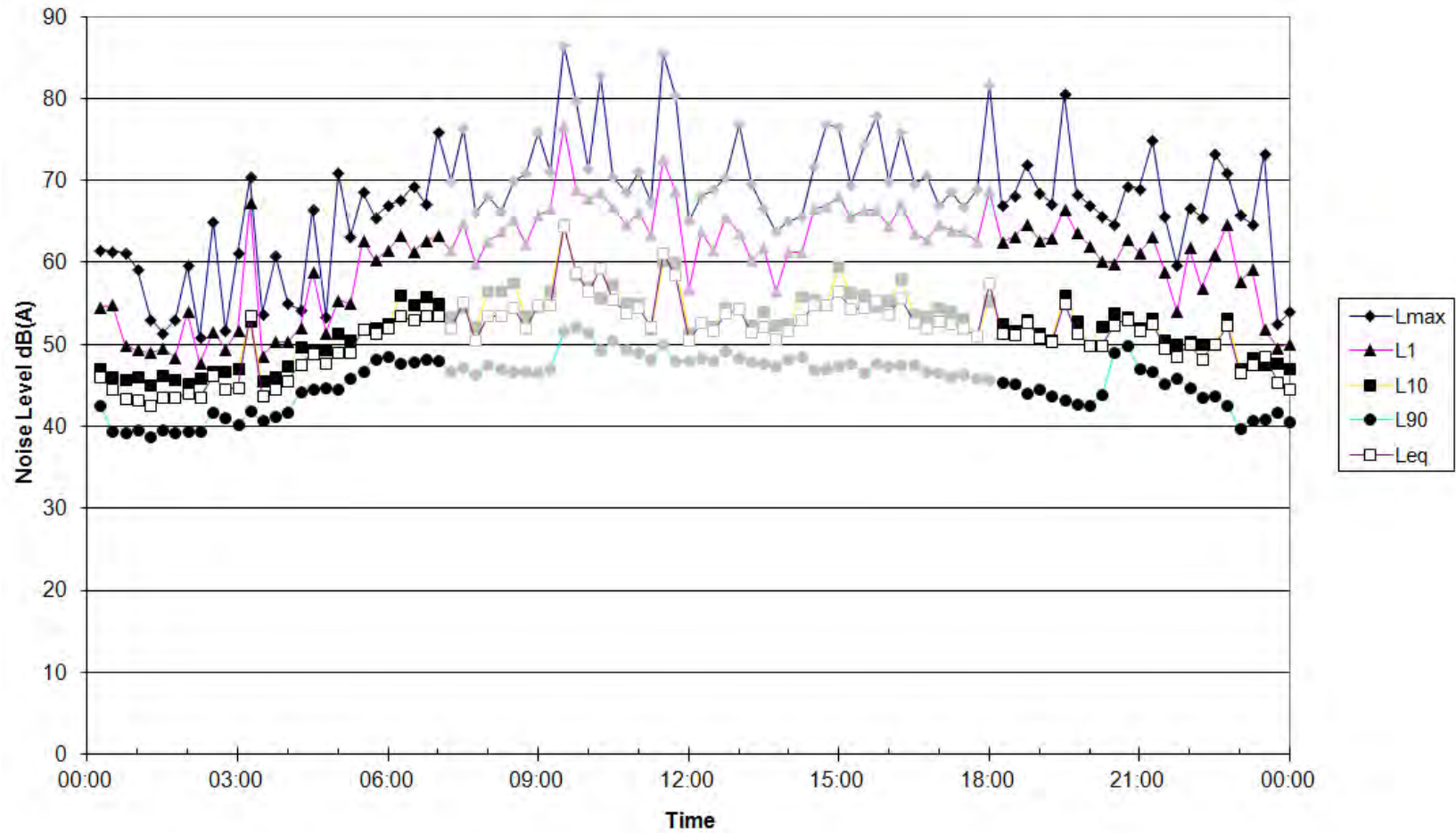
Measured Noise Levels
Receptor R9 - Monday 23/02/2015



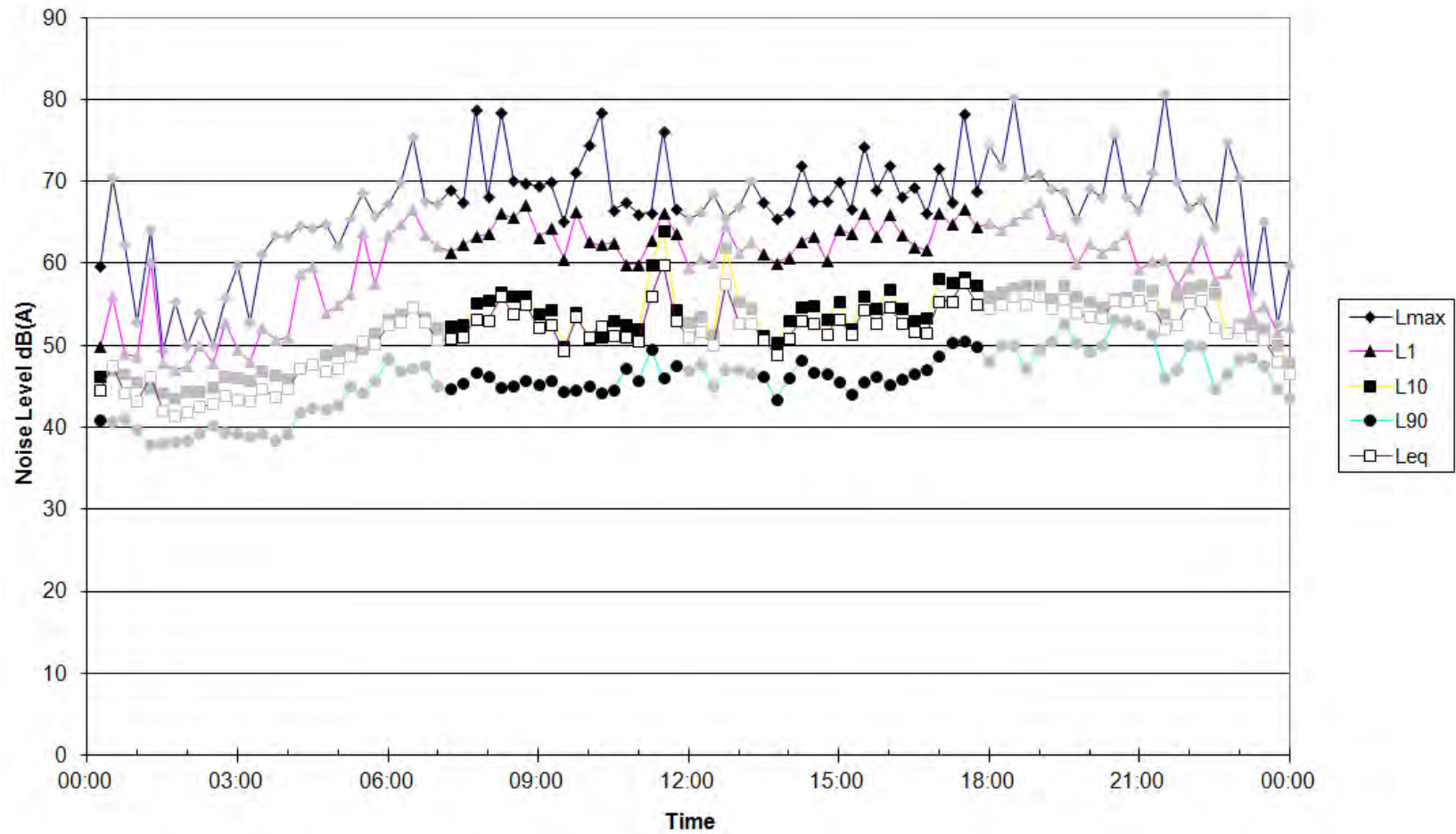
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Receptor R9 - Tuesday 24/02/2015



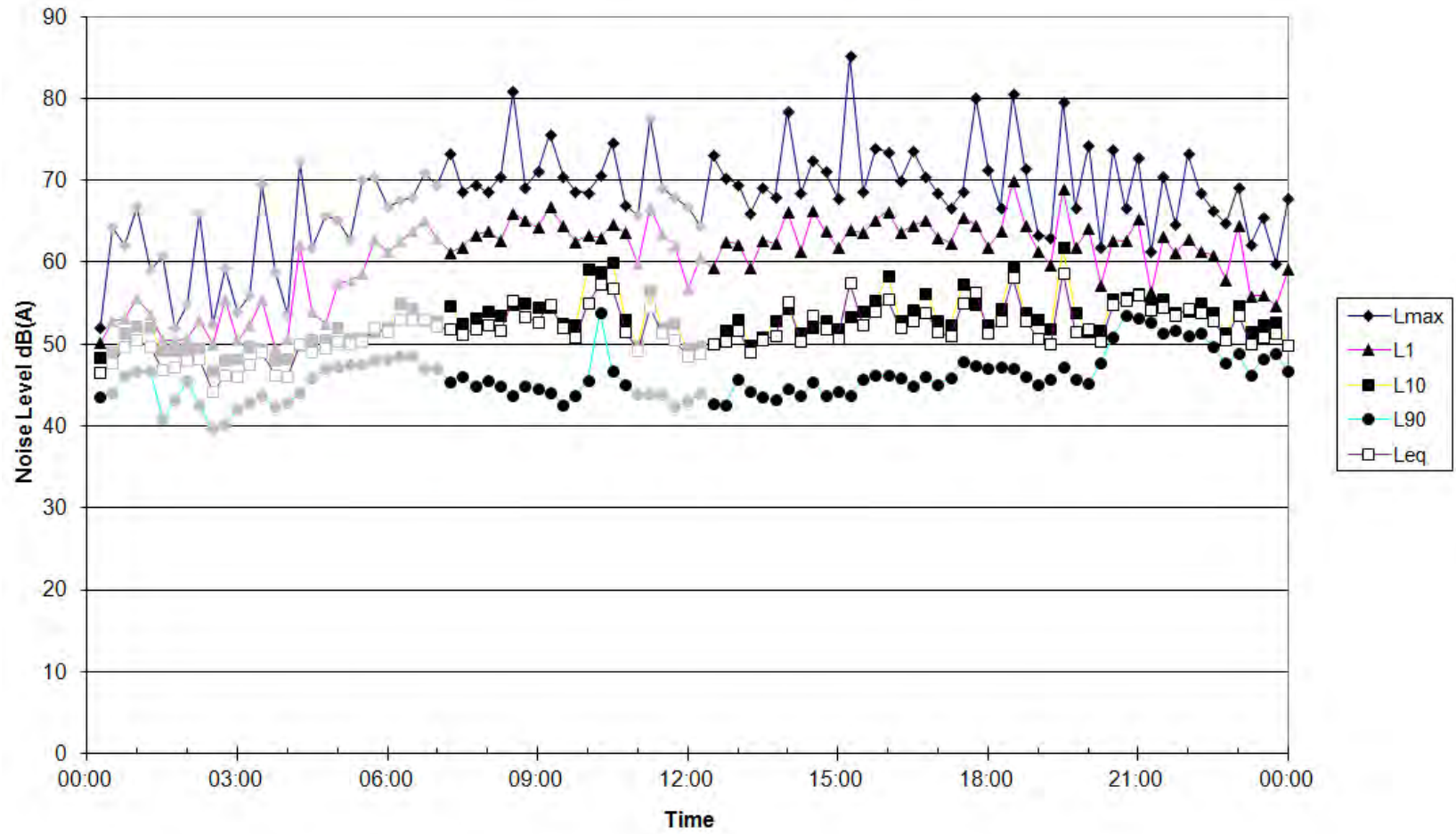
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Receptor R9 - Wednesday 25/02/2015



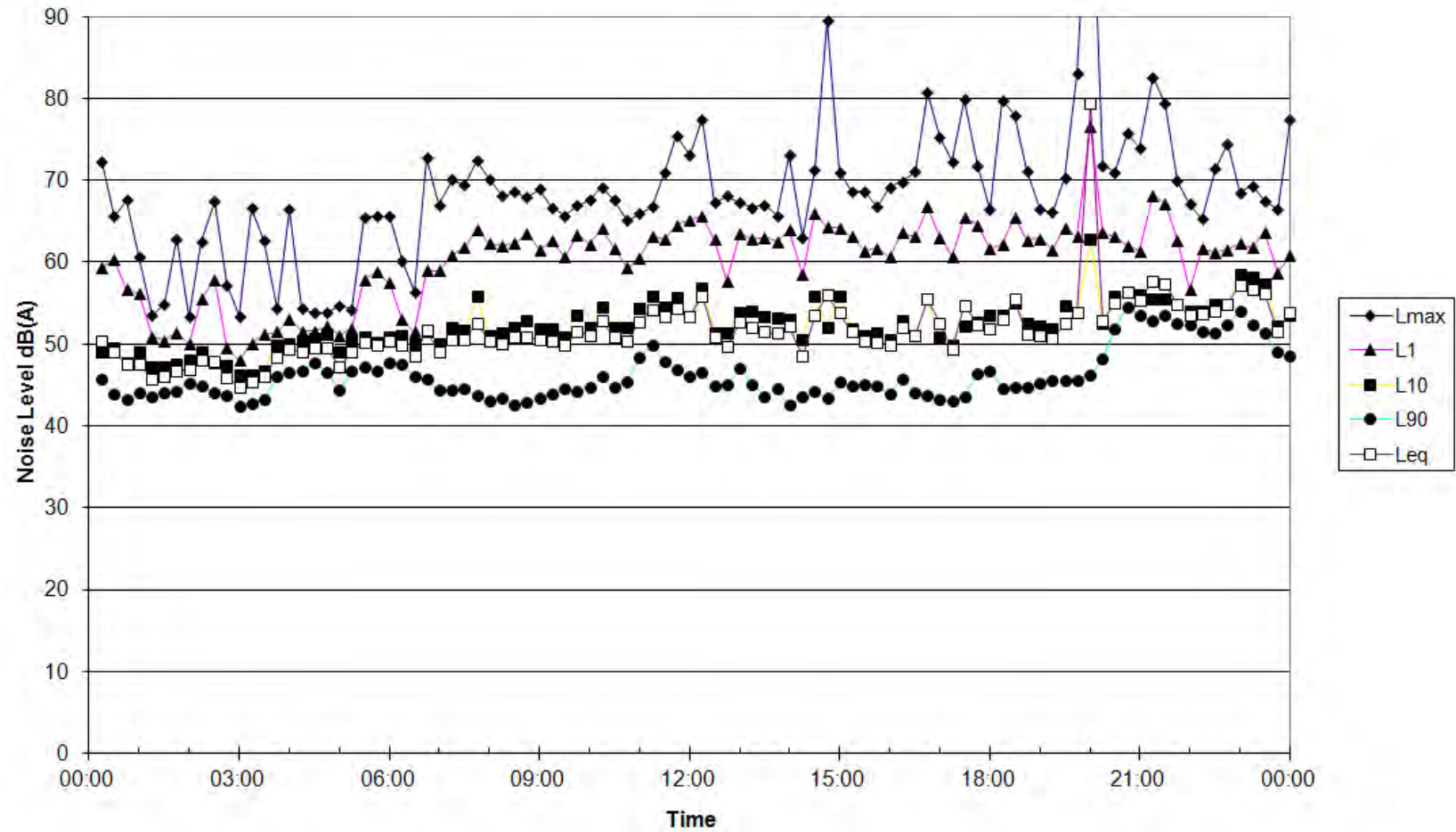
Measured Noise Levels
Receptor R9 - Thursday 26/02/2015



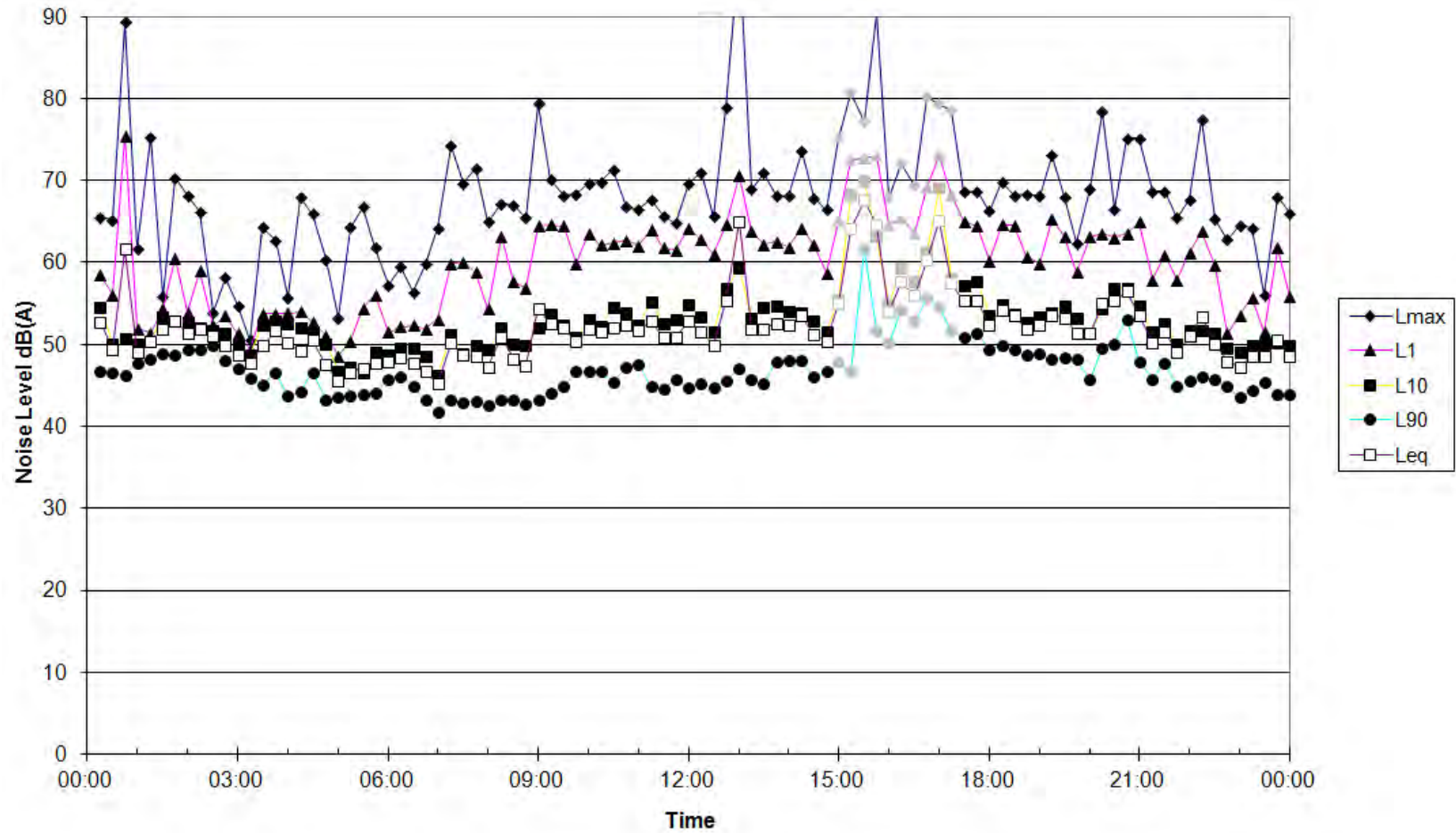
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Receptor R9 - Friday 27/02/2015



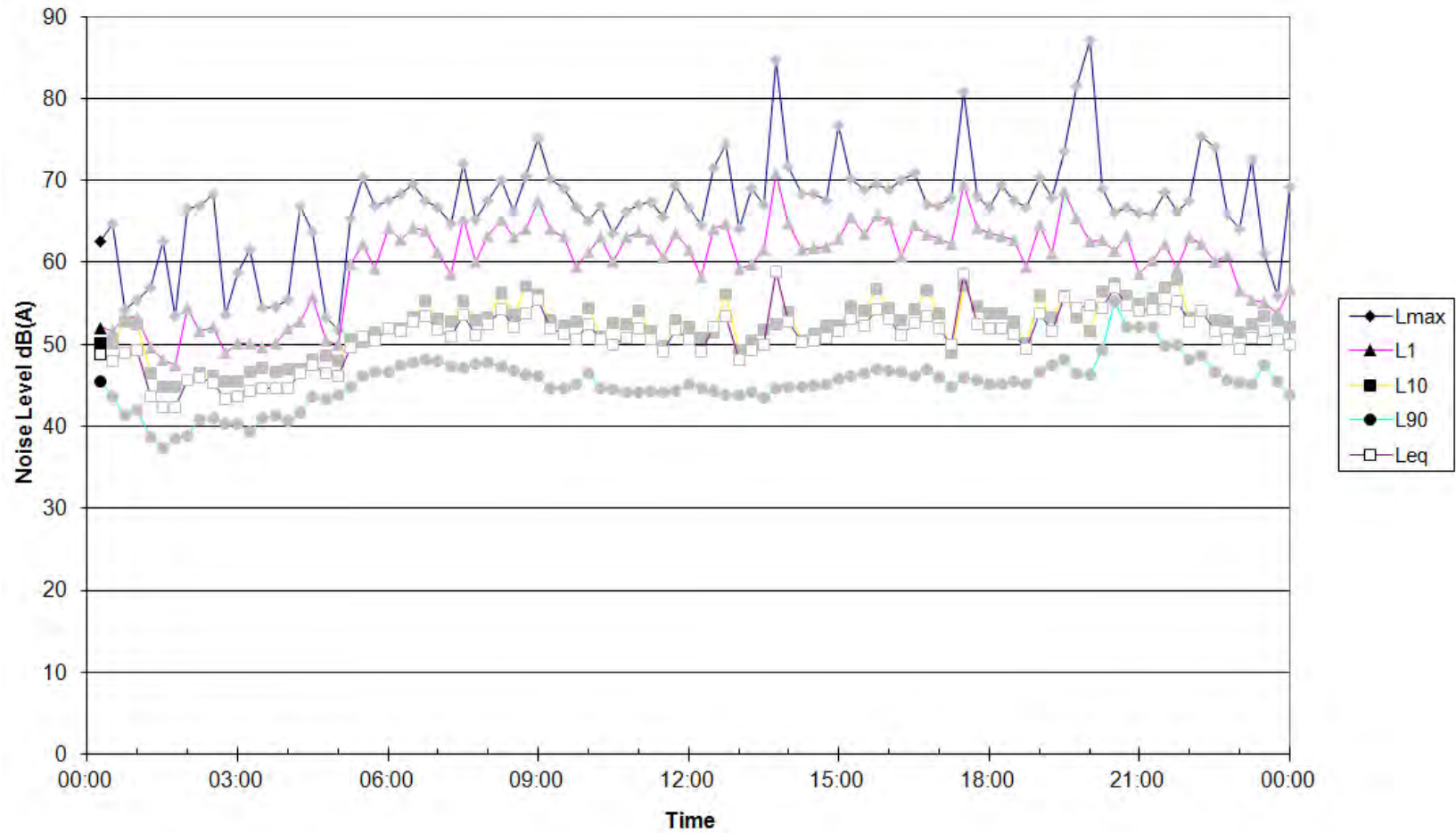
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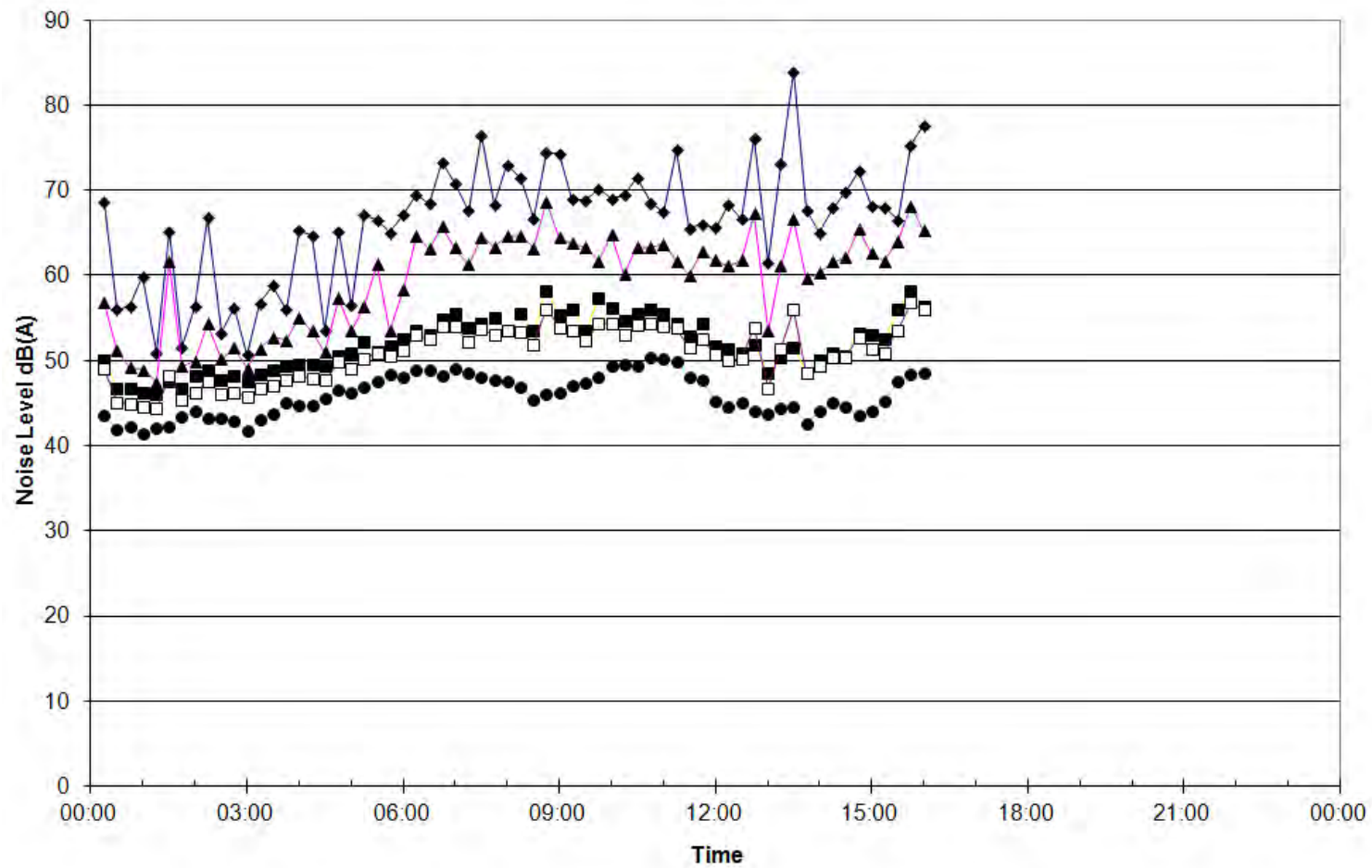
Measured Noise Levels
Receptor R9 - Sunday 01/03/2015



**Measured Noise Levels
Receptor R9 - Monday 02/03/2015**



Measured Noise Levels
Receptor R9 - Tuesday 03/03/2015



**AIR QUALITY IMPACT ASSESSMENT
REPORT FOR
2 SWETTENHAM ROAD,
MINTO NSW**

Prepared for: Richard Coneliano, Director, Redox Pty Ltd
Malcolm Perrins, Redox Pty Ltd
NSW EPA
Department of Planning & Environment

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Report No: 148292_AQIA_Rev2
August 2016
(Released: 30 August 2016)



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Contents	Page
1. INTRODUCTION	1
2. SITE DETAILS AND PROPOSED DEVELOPMENT	3
2.1 Site location	3
2.2 Description of the Site and Surrounding Area	3
2.3 Nearest identified sensitive receptors	5
2.4 Description of the Proposal	7
2.4.1 Raw Materials	10
2.4.2 Process Description	10
2.4.3 Hours of Operation	10
3. METEOROLOGY AND LOCAL AIR QUALITY	11
3.1 Project Site Representative Meteorological Data	11
3.2 Wind Rose Plots	11
3.3 Local Wind Trends	11
3.4 Terrain and Structural Effects on Dispersion	14
4. AIR QUALITY CRITERIA AND GUIDELINES	16
4.1 Protection of the Environment Operations Act 1997	16
4.2 Protection of Environment Operations (Clean Air) Regulation 2010	17
4.3 Environment Protection Licence	17
4.4 NSW Environment Protection Authority Guidelines	18
4.5 Odour Detection Threshold Limits	22
5. AIR QUALITY IMPACT MITIGATION AND MONITORING MEASURES	23
6. AIR QUALITY IMPACTS FROM CONSTRUCTION	25
7. AIR IMPACT ASSESSMENT	26
7.1 Emission Sources	26
7.2 Emission Rate Derivation	26
7.3 Assumptions	27
7.4 Impact Modelling	27
7.5 Impact Modelling Results	27
7.6 Discussion of Air Impacts	30
8. STATEMENT OF POTENTIAL AIR IMPACT	31
9. LIMITATIONS	32

Tables	Page
Table 2-1: Nearest Potentially Affected Receivers Considered	6
Table 4-1: Relevant Limits from the Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales (2005)	19
Table 4-2: Characteristics of Chemicals	20
Table 4-3: Relevant Detection Threshold Limits	22
Table 7-1: Modelled Acetic Acid Impact Results at Receptors	28
Table 7-2: Modelled Formic Acid Impact Results at Receptors	29
Table 7-3: Modelled Impact Results at Boundary	30

Figures	Page
Figure 2-1: Location of Site	4
Figure 2-2: Aerial View of Site	5
Figure 2-3: Aerial Photograph of the Project Site Location and the Nearest Potentially Affected Receptors	7
Figure 2-4: Site Plan	8
Figure 2-5: Proposed Site Layout	9
Figure 3-1: Wind Rose Plots for the Referenced Meteorological Station – Bureau of Meteorology Campbelltown AWS (2015)	13
Figure 3-2: Local Topography of Site, no vertical exaggeration	14
Figure 3-3: Local Topography of Site, factor of 10 vertical exaggeration	15
Figure 5-1: Scrubber Design	23
Figure 7-1: Calculated Evaporative Losses from Tanks	26
Figure 7-2: Acetic Acid Modelled Results	28
Figure 7-3: Formic Acid Modelled Results	29





1. INTRODUCTION

Benbow Environmental has been engaged by Redox Pty Ltd to undertake an air quality impact assessment for a proposed chemical dilution and dispensing plant to be located at the existing site situated at 2 Swettenham Road, Minto NSW, Lot 1711 DP 1089572. This assessment determines the contribution to air pollution from the proposed operations at the nearest sensitive receptors.

Note: This assessment is limited to an evaluation of potential emissions from the proposed Stage IV diluting and decanting plant and does not consider any emissions from existing site activities.

This AQIA has been prepared in accordance with the NSW EPA guidelines *“Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales”* (August 2005).

The current consent granted in 2003 made reference to specific air pollution controls that would be required when the Stage IV development proceeded and would need to be implemented before operations commenced.

These were the following:

The Notice of Determination S01/01687 (2003)

Air Quality Impacts

Odour

4.35 The Applicant shall design, construct, operate and maintain the development to prevent the emission of any offensive odour from the site that is attributed to the operation of the development. For the purposes of this condition, “offensive odour” has the same meaning as defined under the Protection of the Environment Operations Act 1997.

Note: Section 129 of the Protection of the Environment Operations Act 1997 provides that the Applicant must not cause or permit the emission of any offensive odour from the site, but provides a defence if the emission is identified in the relevant Environment Protection Licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of the Licence directed at minimising odour.

Acetic Acid Scrubber

4.36 The Applicant shall design, construct, commission and operate the acetic acid scrubber to ensure that the emissions from the scrubber meet the requirement specified in the Environment Protection Licence issued for the development under the Protection of the Environment Operations Act 1997.

4.37 Prior to the commencement of decanting activities involving acetic acid on the site, the Applicant shall submit to the director-General and the EPA the manufacturer’s performance guarantee and the detailed final design of the acetic acid scrubber. The guarantee shall be accompanied by an air quality assessment to predict the performance of the scrubber and to confirm that the final design of the scrubber is capable of achieve relevant ambient air quality criteria. The air quality assessment shall be undertaken in accordance with the EPA’s Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW (2001). Commencement of the acetic acid decanting activities at the site shall not commence until the Director-General has approved the manufacturer’s performance guarantee and air quality assessment, in consultation with the EPA.



Dust Emissions

4.38 The Applicant shall design, construct, commission, operate and maintain the development in a manner that minimises the dust emissions from the site. All activities undertaken on the site shall be carried out in a manner that minimises the generation of dust, and emission of dust from the site, including wind-blown and traffic-generated dust.

Although the air quality impact assessment guidelines have been updated in 2005, these requirements are still very much current and have been included in this AQIA.

2. SITE DETAILS AND PROPOSED DEVELOPMENT

This section provides a description of the site, surroundings and proposed development.

2.1 SITE LOCATION

The subject site is located at 2 Swettenham Road, Minto NSW, Lot 1711 DP 1089572. The site is located in an IN2 – Light Industrial zone within the City of Campbelltown Council Area.

Figure 2-1 shows the location of the site in a local context and Figure 2-2 shows an aerial photo of the site and surrounding area.

2.2 DESCRIPTION OF THE SITE AND SURROUNDING AREA

The site is situated within a Light Industrial area. Further to the north, south and east are areas zoned as IN1 – General Industrial. Further to the west of the site are areas zoned as R2 – Low Density Residential and RE1 – Public Recreation.

The nearest sensitive receptor is a child care centre located approximately 195 m away from the subject site.

Approximately 65 m to the south of the site is Bow Bowing Creek.

Figure 2-1: Location of Site



Source: www.maps.six.nsw.gov.au

 Not to scale	LEGEND: Subject Site 	 Benbow Environmental 13 Daking Street, North Parramatta NSW 2151

Figure 2-2: Aerial View of Site



2.3 NEAREST IDENTIFIED SENSITIVE RECEPTORS

Table 2-1 provides the list of the nearest identified sensitive receptors that have the potential to be affected by the processes at the subject site. As per the AMMAAP sensitive receptors to which criteria are applied are defined as. Even though criteria is not applicable to industrial or commercial premises, neighbouring premises as detailed in Table 2-1 have been included as discrete receptors in the modelling assessment.



Table 2-1: Nearest Potentially Affected Receivers Considered

Receptor ID	Address	Lot & DP	Approx. Distance from Proposed Development	Current Use
R1	30 Swettenham Road, Minto	Lot 12, DP 834139	195m N	Childcare Centre
R2	38 Galloway Crescent, St Andrews	Lot 1, DP 876582	430m N	Residential
R3	22 Galloway Crescent, St Andrews	Lot 9 DP 876582	325m NW	Residential
R4	10 Earn Place, St Andrews	Lot 313 DP 261631	265m NW	Residential
R5	6 Coll Place, St Andrews	Lot 294, DP 261631	240m W	Residential
R6	18 Hebrides Place, St Andrews	Lot 282 DP 261631	330m SW	Residential
R7	12 Kintyre Place, St Andrews	Lot 111, DP 263022	505m SW	Residential
R8	4 Wick Place, St Andrews	Lot 339, DP 260428	680m SW	Residential
R9	20 Swettenham Road, Minto	Lot 2 DP 834139	85m N	Private Recreational
R10	3 Holmes Road, Minto	Lot 172 DP 878463	145m NE	Industrial
R11	57 Airds Road, Minto	Lot 12 DP 1076508	175m E	Industrial
R12	13 Montore Road, Minto	Lot 6 DP 1076508	115m SE	Industrial
R13	9 Montore Road, Minto	Lot 4 DP 1076508	145m S	Industrial

Figure 2-3: Aerial Photograph of the Project Site Location and the Nearest Potentially Affected Receptors



2.4 DESCRIPTION OF THE PROPOSAL

The site plan and layout for the chemical dilution and dispensing plant are given in Figure 2-4 and Figure 2-5.

OVERALL SITE PLAN 1:700

FLOOR PLAN 1:400

SECTION A-A 1:400

SECTION B-B 1:400

NORTH WEST ELEVATION 1:400

DEVELOPMENT DATA

ITEM	DESCRIPTION	QUANTITY
1	INDUSTRIAL BUILDING	1
2	PARKING AREAS	100
3	ROADS	100
4	LANDSCAPING	100
5	UTILITIES	100
6	WATER	100
7	SEWER	100
8	STORMWATER	100
9	ROADWAY	100
10	LANDSCAPING	100
11	UTILITIES	100
12	WATER	100
13	SEWER	100
14	STORMWATER	100
15	ROADWAY	100
16	LANDSCAPING	100
17	UTILITIES	100
18	WATER	100
19	SEWER	100
20	STORMWATER	100
21	ROADWAY	100
22	LANDSCAPING	100
23	UTILITIES	100
24	WATER	100
25	SEWER	100
26	STORMWATER	100
27	ROADWAY	100
28	LANDSCAPING	100
29	UTILITIES	100
30	WATER	100
31	SEWER	100
32	STORMWATER	100
33	ROADWAY	100
34	LANDSCAPING	100
35	UTILITIES	100
36	WATER	100
37	SEWER	100
38	STORMWATER	100
39	ROADWAY	100
40	LANDSCAPING	100
41	UTILITIES	100
42	WATER	100
43	SEWER	100
44	STORMWATER	100
45	ROADWAY	100
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48	WATER	100
49	SEWER	100
50	STORMWATER	100
51	ROADWAY	100
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53	UTILITIES	100
54	WATER	100
55	SEWER	100
56	STORMWATER	100
57	ROADWAY	100
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91	SEWER	100
92	STORMWATER	100
93	ROADWAY	100
94	LANDSCAPING	100
95	UTILITIES	100
96	WATER	100
97	SEWER	100
98	STORMWATER	100
99	ROADWAY	100
100	LANDSCAPING	100

ALGORY ZAPPA & ASSOCIATES PTY. LTD.

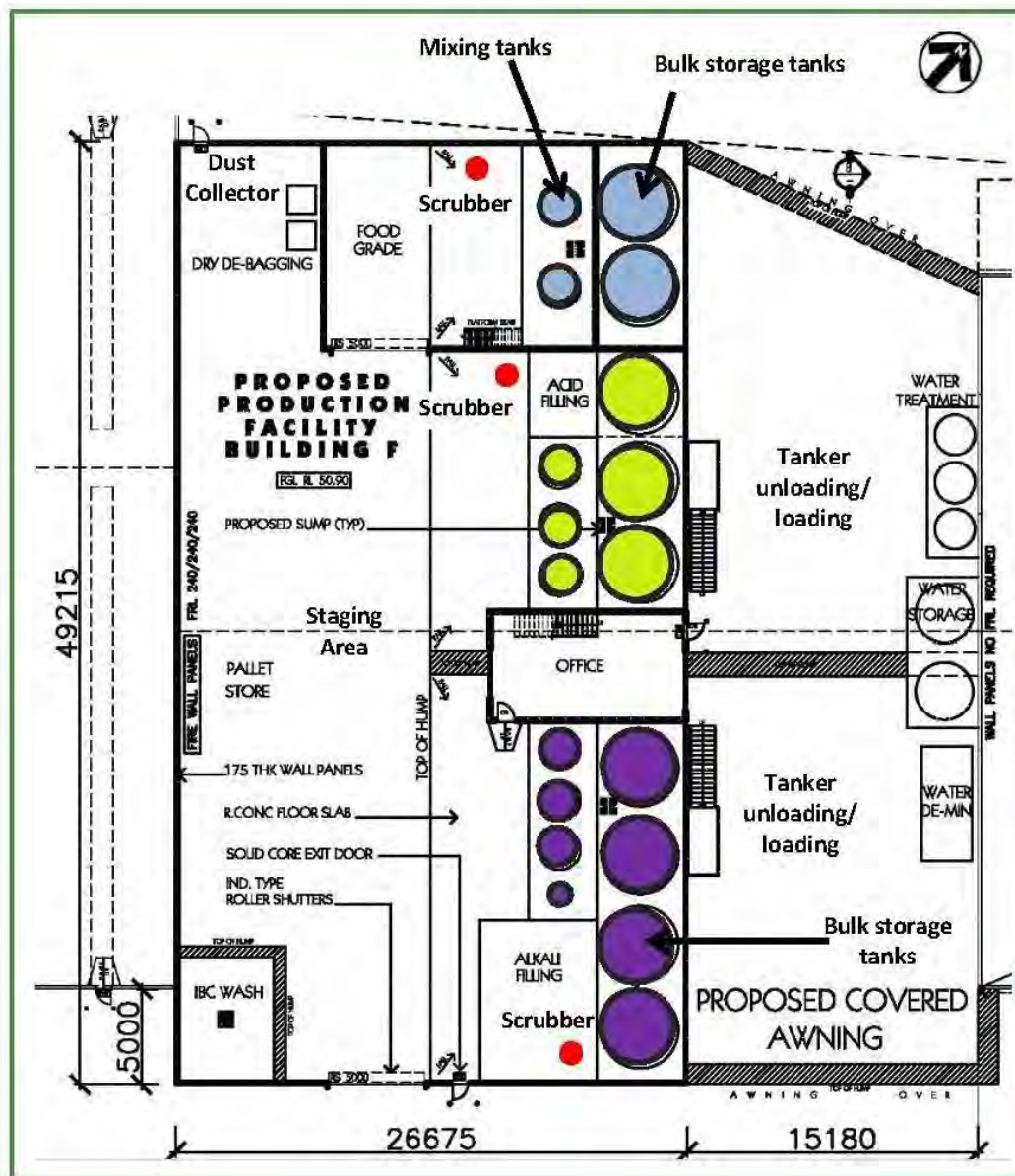
PROPOSED INDUSTRIAL DEVELOPMENT

LOT 1711 DP 108 9579, No 9 Sweetenham Rd, Birkdale

12/06/10

AD

Figure 2-5: Proposed Site Layout



2.4.1 Raw Materials

The following is an indicative list of chemicals:

- Phosphoric acid Class 8
- Formic acid Class 8(3)
- Acetic acid Class 8(3)
- Ferric chloride Class 8
- Sulphuric acid 98% Class 8
- Fluoro silicic acid Class 8(6.1)
- Citric acid Food grade
- “Adblue” Diesel additive
- Urea ammonium nitrate solution
- Sodium hypochlorite Class 8
- Sodium hydroxide Class 8
- Potassium hydroxide Class 8

2.4.2 Process Description

The production facility would consist of 18 storage tanks & 8 mix tanks in 3 ‘rooms’ for Alkali, Food Grade, and Acids. Unused space in the production building will be utilised as Alkali and Acid IBC storage. The 3 rooms will be individually bunded with the remaining area separated down the centre in Alkali & Acid bunds on the left and right. In addition there will be a waste water treatment plant, an IBC washer, 2 Carboy filling stations, a demineralised water plant, and 2 water tanks.

Positioned along the NW face of the production facility will be 18 x 30,000L conical bottom storage tanks. These will be used both for incoming raw materials, as well as for finished goods bound for delivery by bulk tanker. Most will be stainless steel construction, with a couple in Polypropylene.

Each tank will be a diameter of 3M and height approx. 4.5M, using 1% more material than the optimum volume to surface ratio. They will be spaced about 600mm apart and from walls. Components are positioned in order to minimise losses from connecting lines. The storage tanks are adjacent to the driveway for bulk tanker load & unload. The mix tanks are between the storage tanks and IBC filling areas.

2.4.3 Hours of Operation

The sites operational hours are:

- Monday to Friday: 7am – 6pm
- Saturday: 7am – 4pm

3. METEOROLOGY AND LOCAL AIR QUALITY

3.1 PROJECT SITE REPRESENTATIVE METEOROLOGICAL DATA

The nearest weather monitoring station within proximity to the subject site is the Campbelltown AWS operated by the Bureau of Meteorology. This monitoring station is located approximately 7.5 kilometres away to the south of the subject site and was considered to be the most appropriate due to the vicinity, completeness and latest data available to carry out dispersion modelling.

Weather data for the year 2015 was obtained. For the purpose of inclusion in the air dispersion model a meteorological file using 2015 as the base year was generated by Air Quality Professionals Pty Ltd as a site-representative meteorological file for use in the assessment.

3.2 WIND ROSE PLOTS

Wind rose plots show the direction from which the wind is coming with triangles known as “petals”. The petals of the plots in Figure 3-1 summarise wind direction data into 8 compass directions ie. north, north-east, east, south-east, etc.

The length of the triangles, or “petals”, indicates the frequency that the wind blows from the direction presented. Longer petals for a given direction indicate a higher frequency of wind from that direction. Each petal is divided into segments, with each segment representing one of the six wind speed classes. Thus, the segments of a petal show what proportion of wind for a given direction falls into each class.

The proportion of time for which wind speed is equal to or less than 0.5 m/s, when speed is negligible, is referred to as calm hours or “calms”. Calms are not shown on a wind rose as they have no direction, but the proportion of time that they make up for the period under consideration is noted under each wind rose.

The concentric circles in each wind rose are the axes that denote wind frequencies. In comparing the plots it should be noted that the axis varies between wind roses, although all wind roses are the same size. The frequencies shown in the first quadrant (top-left quarter) of each wind rose are stated beneath the wind rose.

3.3 LOCAL WIND TRENDS

Seasonal wind rose plots for this site utilising Campbelltown AWS 2015 data have been included as Figure 3-1.

Based on the information presented from the 2015 data for Campbelltown, annual average wind speeds of 1.87 m/s and a calms frequency of 19.00% were estimated. Annual winds from the south and south west were found to be dominant and were present for approximately 27% and 14% of the time respectively.

The summer season data showed the prevalence of winds from the south, north-east and east at frequencies of 26%, 16% and 12% respectively. All other wind directions have only occurred at frequencies less than 10%. The average autumn wind speed was determined to be 2.01 m/s with a calms frequency of 15.74%.

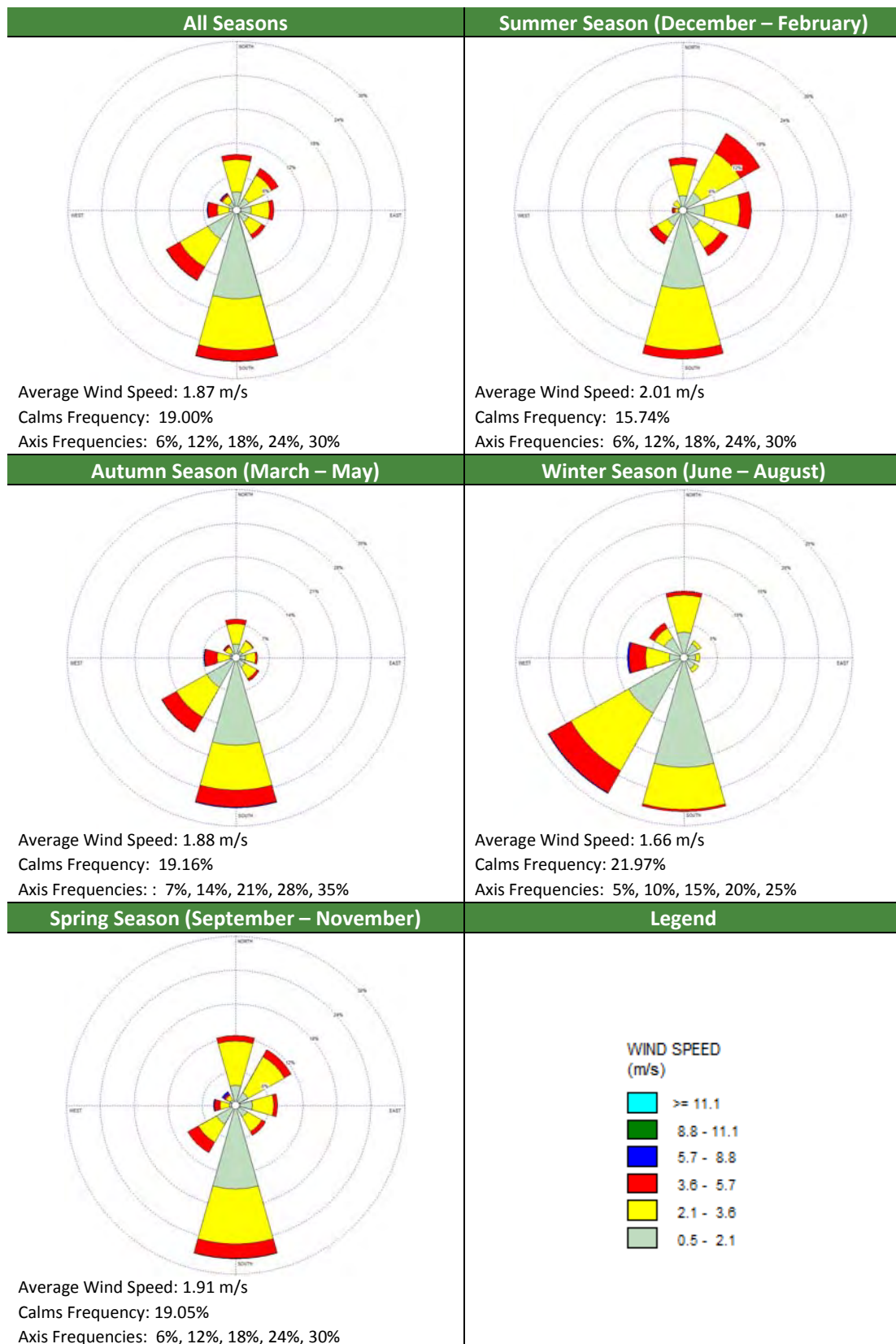


The average autumn wind speed was estimated to be 1.88 m/s, with a calms frequency of 19.16%. Southern winds were found to be dominant at a frequency of around 31%. Winds from the south west were found to occur 18% of the time while the remainder of the wind directions have contributions of less than 8%.

In the winter time, average wind speeds of 1.66 m/s with a frequency of calms of 21.97% were recorded. Dominant strong winds were found to be present from the south-west (23%) and west (23%). The rest of the wind directions were found to be present at frequencies less than 10%.

In spring, dominant winds are blowing from the south (27%), north (12%) and north-east (11%). The rest of the wind directions were found to be present at frequencies less than 10%. The average winter wind speed was 1.91 m/s with a calms frequency of 19.05%.

Figure 3-1: Wind Rose Plots for the Referenced Meteorological Station – Bureau of Meteorology Campbelltown AWS (2015)



3.4 TERRAIN AND STRUCTURAL EFFECTS ON DISPERSION

The meteorological condition known as katabatic flow (or katabatic drift) is often identified as the condition under which maximum environmental impacts from primarily ground-based sources are likely to occur. Katabatic flow is simply the movement of cold air down a slope, generally under stable atmospheric conditions. Under such circumstances, dispersion of airborne pollutants is generally slow and the associated impacts can reach their peak.

The site is located in a valley; as such katabatic flow is unlikely to affect any emissions from the subject site because katabatic flow only affects receptors that are located at a lower terrain elevation compared to the site's elevation. Figure 3-2 with all axes equally scaled, shows the terrain as it actually exists when viewed in a conventional three dimensional view. Figure 3-3 shows the terrain with the z-axis (i.e. vertical axis) exaggerated by a factor of 10 (i.e. a given distance on the x-axis or y-axis appears three times as great on the z-axis) in order to provide a clearer description of the topography. A coloured scale bar shows elevations corresponding to the colours used in the figures.

Figure 3-2: Local Topography of Site, no vertical exaggeration

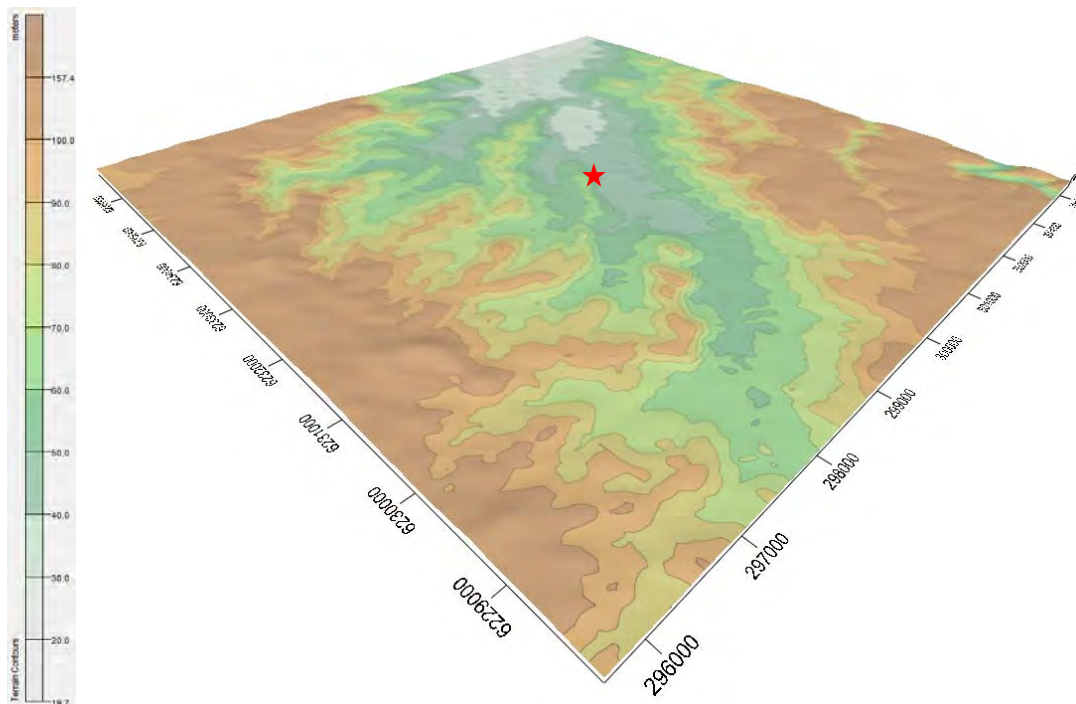
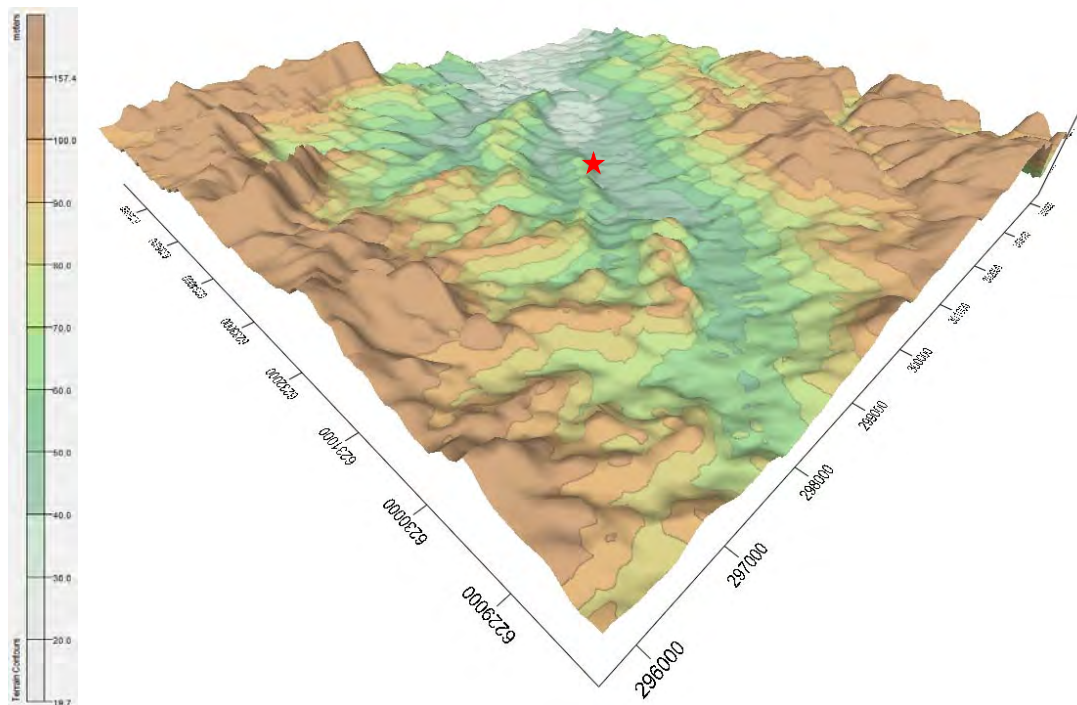


Figure 3-3: Local Topography of Site, factor of 10 vertical exaggeration



4. AIR QUALITY CRITERIA AND GUIDELINES

4.1 PROTECTION OF THE ENVIRONMENT OPERATIONS ACT 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) applies the following definitions relating to air pollution:

“Air pollution” means the emission into the air of any air impurity.

While *“air impurity”* includes smoke, dust (including fly ash), cinders, solid particles of any kind, gases, fumes, mists odours, and radioactive substances

The following sections of this Act have most relevance to the site:

- *Section 124 Operation of Plant - other than domestic plant*

The occupier of any premises who operates any plant in or on those premises in such a manner as to cause air pollution from those premises is guilty of an offence if the air pollution so caused, or any part of the air pollution so caused, is caused by the occupier's failure:

- (a) to maintain the plant in an efficient condition, or*
- (b) to operate the plant in a proper and efficient manner.*

- *Section 126 Dealing with Materials*

(1) The occupier of any premises who deals with materials in or on those premises in such a manner as to cause air pollution from those premises is guilty of an offence if the air pollution so caused, or any part of the air pollution so caused, is caused by the occupiers failure to deal with those materials in a proper and efficient manner.

(2) In this section:

deal with materials means process, handle, move, store or dispose of the materials.

Materials includes raw materials, materials in the process of manufacture, manufactured materials, by-products or waste materials.

- *Section 127 Proof of causing pollution*

To prove that air pollution was caused from premises within the meaning of Sections 124 – 126, it is sufficient to prove that air pollution was caused on the premises, unless the defendant satisfies the court that the air pollution did not cause air pollution outside the premises.

- *Section 128 Standards of air impurities not to be exceeded*

(1) The occupier of any premises must not carry on any activity, or operate any plant, in or on the premises in such a manner as to cause or permit the emission at any point specified in or determined in accordance with the regulations of air impurities in excess of:

(a) The standard of concentration and the rate, or

(b) The standard of concentration or the rate.

Prescribed by the regulations in respect of any such activity or any such plant.

(2) Where neither such a standard nor rate has been so prescribed, the occupier of any premises must carry on any activity, or operate any plant, in or on the premises by such practicable means as may be necessary to prevent or minimise air pollution.

The proposed development is required to comply with this Act.

4.2 PROTECTION OF ENVIRONMENT OPERATIONS (CLEAN AIR) REGULATION 2010

In accordance with Part 5 of the *Protection of the Environment Operations (Clean Air) Regulation 2010* (herein referred to as the Clean Air Regulation 2010), the activities and plant would belong to Group C (Standards for non-scheduled premises) as it is to be commenced to be carried on, or to operate, on or after 1 September 2005 as a result of development consent granted pursuant to a development application made on or after 1 September 2005.

Schedule 6 of the Clean Air Regulation 2010 provides standards of concentration for non-scheduled premises.

Solid Particles (Group C) for any activity or plant:

Concentration: 100 mg/m³

The proposed development is required to comply with this Regulation.

4.3 ENVIRONMENT PROTECTION LICENCE

Licence Number: 12041

P1.1 Location of monitoring/discharge points and areas:

Type of Monitoring Point	Type of Discharge Point	Description of Location
Air emissions monitoring	Discharge to air	Acetic acid scrubber in tank farm / decanting area, labelled A on map 1169-02 attached to licence application dated 20 November 2003 in file 401378A2.

L9.1 Odour: no condition of this licence identifies a potentially offensive odour for the purposes of section 129 of the Protection of the Environment Operations Act 1997.

O5.1 Dust: All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of the dust from the premises.

M2.1 Requirement to monitor concentration of pollutants discharged:

Pollutant	Units of measure	Frequency	Sampling method
Acetic acid	Milligrams per cubic metre	quarterly	Methods approved in writing by the Authority

E3 Acetic Acid Scrubber

E3.1 The objective of this condition is to develop emission concentration limits to ensure that the premise can comply with Section 129 of the Protection of the Environment Operations Act 1997.

E3.2 Prior to the commencement of construction of the plant, the licensee must submit a report to the EPA's Manager Illawarra on the development of a site specific emission concentration limit for the acetic acid scrubber to ensure compliance with the EPA's environmental outcomes.

All dispersion modelling undertaken to develop the emission concentration limit must be conducted strictly in accordance with the methodologies set out in the EPA's Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW (2001).

E3.3 Prior to the commencement of construction of the plant, the licensee must provide to the EPA's Manager Illawarra, the manufacturer's performance guarantee and the detailed final design of the acetic acid scrubber, demonstrating to the satisfaction of the ELA that emissions will comply with the ground level concentration specified in the EPA's Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW (2001).

4.4 NSW ENVIRONMENT PROTECTION AUTHORITY GUIDELINES

The document, *"Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales"* (AMMAAP) published by the NSW Environment Protection Authority (NSW EPA) provides guidance on methodology and thresholds that are to be used for the air impact assessment of a proposed development. This air impact assessment has been conducted in accordance with this guideline, and assessable pollutants (along with their corresponding limits) are summarised in Table 4-1.



Table 4-1: Relevant Limits from the Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales (2005)

Pollutant	Averaging Period	Percentile	Concentration	
			ppm	mg/m ³
Acetic acid	1 hour	99.9th	0.11	0.27 ¹
Sulfuric Acid	1 hour	99.9th	-	0.018 ²

Note: ¹ Impact assessment criteria for individual odorous air pollutants must be applied at the nearest existing or likely future off-site sensitive receptors.

² Impact assessment criteria for individual toxic air pollutants must be applied at and beyond the boundary of the facility.

No other limit concentrations for the proposed site chemicals are listed in the AMMAAP.

Acetic acid the limits have been assumed to apply to each of the chemicals to be stored and processed on site.

The following table provides a comparison between the chemicals to be stored, diluted and decanted.

Table 4-2: Characteristics of Chemicals

Chemical	Vapour Pressure at °C	Flash Point	Pungency and Odour	Flammable or Combustible	Toxic combustion	Incompatible	Risk rating for off-site impacts
Water	24mm Hg @ 25°C						
Phosphoric acid Class 8 PGIII UN1805	0.03mm Hg @ 20°C 43mm Hg @ 25°C	Not relevant	Slight acidic odour	No	Oxides products of phosphorus	Alkali Sulphuric acid Water	Low
Formic acid Class 8(3) PGII UN1778, 1779	35mm Hg @ 20°C 43mm Hg @ 25°C	69°C Depends on % strength ¹	Highly pungent	Combustible C1	Carbon monoxide Acrid smoke Irritating fumes	Alkali Sulphuric acid	Moderate
Acetic acid Class 8(3) PGII UN2789, 2790	11.4mm Hg @ 20°C 15.7mm Hg @ 25°C	39°C	Highly pungent	Flammable	Irritating fumes	Violent reaction with alkali Incompatible with strong acids	Moderate
Ferric chloride Class 8 PGIII UN1830	Negligible at ambient conditions	Not relevant	Slight odour similar to hydrochloric acid	No	Toxic fumes of hydrogen chloride	Reacts with sulphuric acid to produce toxic gases	Moderate
Sulphuric acid Class 8 PGIII UN1778	Negligible at ambient conditions	Not relevant	Very slight acidic odour	No	Toxic fumes of sulfur oxides	Alkali Acetic acid Ferric chloride Fluorosilicic acid	Low
Fluorosilicic acid Class 8 PGII UN1778	22mm Hg @ 25°C	Not relevant	Pungent	No	Toxic fumes of fluoride	Alkali Sulphuric acid Water	Low
Citric acid Non DG	Negligible	100°C	Odourless	Combustible C2	Acrid smoke Irritating fumes	Alkali	Low to negligible



Table 4-2: Characteristics of Chemicals

Chemical	Vapour Pressure at °C	Flash Point	Pungency and Odour	Flammable or Combustible	Toxic combustion	Incompatible	Risk rating for off-site impacts
Hypochlorite solution Class 8 PGIII UN1791	12-17mm Hg @ 20°C	Not relevant	Slight chlorine (bleach) odour, disagreeable.	No	Toxic fumes of hydrogen chloride and sodium oxide	Acids with generation of toxic gas chlorine	Low
Sodium hydroxide Class 8 PGII UN1823, 1824	Nil at ambient conditions	Not relevant	Odourless	No	Toxic fumes of sodium oxide	Water Acids	Low
Potassium hydroxide Class 8 PGIII UN1813, 1814	Nil at ambient conditions	Not relevant	odourless	No	Toxic fumes of potassium oxide	Water Acids	Low
Urea ammonium nitrate Non DG	Nil	Not relevant	odourless	No	Not relevant	None	Negligible

Note: ¹Flash point also reported as 50°C at 90% aqueous solution so dependent on strength of the solution.

The vapour pressure is the best indicator of the potential for air emissions especially as the process does not involve heat being applied or chemical reactions occurring.

The generation of an increase in temperature in specific chemicals are:

Many of these chemicals have very low to negligible emission rates through evaporation.

The diluting/decanting process operates by adding the chemical beneath a layer of water.

Acetic acid would have the highest volatility so the predicted ground level concentrations would give a very strong indication of whether any of the chemicals would be found at the nearest sensitive receivers.

While limits for sulfuric acid are given, evaporative losses from sulfuric acid storage tanks would be negligible due to the extremely low partial vapour pressure of H_2SO_4 .

4.5 ODOUR DETECTION THRESHOLD LIMITS

The Handbook of Environmental Data on Organic Chemistry 2nd Edition, K. Vershueren 1983 was used to estimate the odour detection threshold limits for acetic acid and formic acid. These values represent the concentration at which the human nose can perceive odour from each chemical. These values will be used in this assessment for the purpose of identifying whether or not odour will likely be detected at the nearest identified sensitive receptors. Where these threshold values are exceeded and detection is expected it does not indicate whether or not odour levels are high enough to cause nuisance.

Table 4-3: Relevant Detection Threshold Limits

Chemical	Minimum Odour Detection Threshold (mg/m ³)
Acetic Acid	0.02
Formic Acid	12

5. AIR QUALITY IMPACT MITIGATION AND MONITORING MEASURES

The proposed operations are very simple and involve no chemical reactions.

The sources of emissions are well understood and consist of the following:

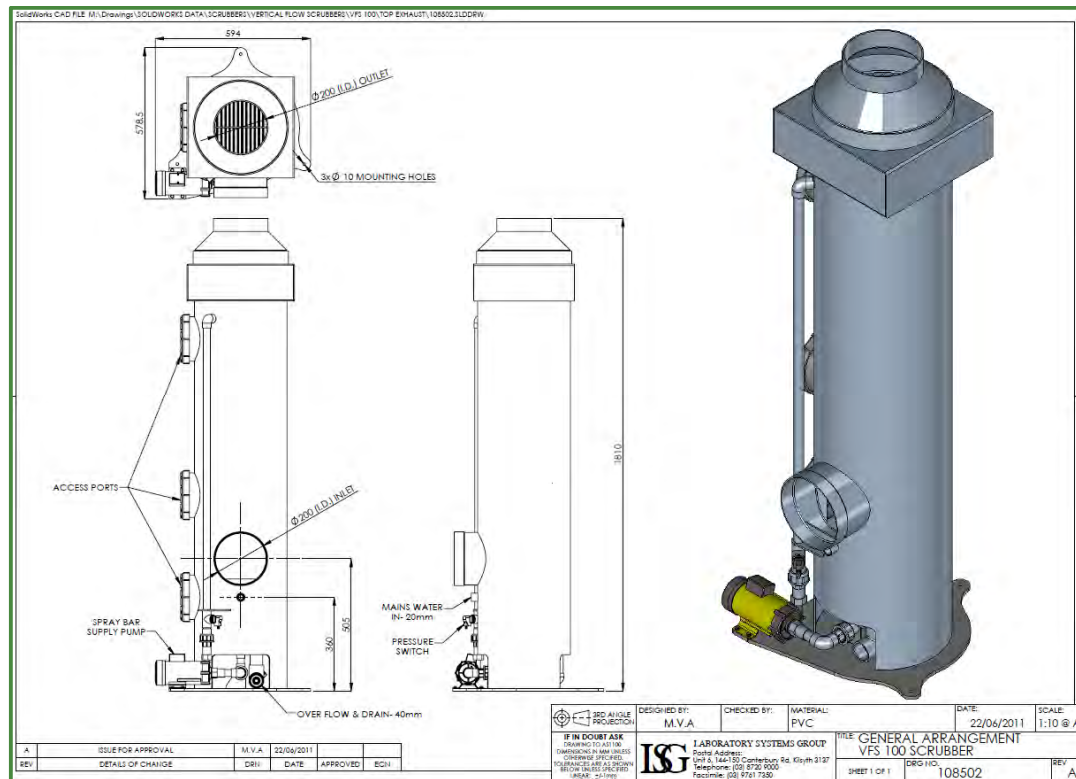
- Venting of the bulk liquid storage tanks during the filling of the tanks;
- Evaporative losses; and
- Losses from the transfer of the chemicals to beneath the surface of the water in the diluting/decanting tanks.

Each of these sources would be vented to the scrubbers.

The site will have three scrubbers, one for each of the designated 'Acid', 'Alkali' and 'Food Grade' chemicals. Scrubbers will have minimum efficiencies of 85%.

Filling and mixing activities would be enclosed and thus limit the potential for uncontrolled fugitive emissions to air.

Figure 5-1: Scrubber Design



The scrubbers are a packed bed with water being the most likely scrubber liquor.

The figure shows the format of the scrubber.



The operation of the scrubber would have interlocks such as:

- Exhaust fan must be working for the transfer pumps to operate.
- Scrubber liquor pump must be generating pressure.
- The liquid level in the scrubber must be above a set point.

Visual and white noise alarms are needed if any of these interlocks should be triggered so prompt action can be taken to complete the daily production requirements.

The use of dilute solutions of sodium hydroxide may be needed for the acid scrubber.

Water is expected to be adequate for the alkali and food grade products.



6. AIR QUALITY IMPACTS FROM CONSTRUCTION

Construction of site involves the installation of the proposed chemical dilution and dispensing plant and adjacent office and amenities building. An onsite access road would be used between existing and proposed plant. As no demolition, and minimal excavation or earthworks are proposed, air quality impacts associated with the construction phase of this development are anticipated to be minimal.

Air emissions from construction works are typically and would be sufficiently managed through a Construction Environmental Management Plan (CEMP). No further assessment is deemed necessary.

7. AIR IMPACT ASSESSMENT

7.1 EMISSION SOURCES

The potential for fugitive emissions is significantly limited in typical day to day operations. Therefore this assessment only considers emissions exhausted from scrubber outlets. This assessment does not consider evaporative emissions from chemical spill. Emissions from spill are assessed in the Preliminary Hazard Analysis ref: 148292_PHA_Rep_Rev1.

The scrubber as detailed in Section 5 has fume extraction from bulk tanks and dispensing tank. The scrubber exhaust is designed to be 3m above roof height.

7.2 EMISSION RATE DERIVATION

The US EPA TANKS Emissions Estimation Software Version 4.09D was used to calculate the evaporative losses of chemicals stored in tanks. Of the sites potential list of chemicals handled, formic acid and acetic acid were available in the software program to calculate the evaporative losses from a fixed roof tank. Tanks were assumed to be refilled every day over a year. Results provided represent the annual kg emission from a single tank.

Figure 7-1: Calculated Evaporative Losses from Tanks

Chemical	Working Losses ¹ (kg)	Breathing Losses ² (kg)	Total Losses (kg)
Formic Acid	298.74	47.83	364.57
Acetic Acid	133.13	19.28	152.41

Note: The TANKS program uses imperial units, here converted to metric units.

¹ Evaporative losses during filling and emptying conditions

² Evaporative losses during storage

The above table provides the calculation of evaporative losses from a single tank. Conservatively in the model it has been assumed that the evaporative losses from dispensing tank equivalent to bulk tanks and thus total annual losses from formic and acetic acid were to be 729.14 kg and 304.8 2kg respectively.



7.3 ASSUMPTIONS

The following assumptions were utilised in the modelling:

- The maximum tank storage of any given chemical would be limited to a single 30,000L tank. As such annual emissions were calculated from a single tank and dispenser.
- The scrubber system was assumed to have an efficiency of 85% fume reduction.
- Exit velocity was assumed to be 10 m/s.
- Stack height is 3m above roof level.
- Emissions from scrubber were conservatively assumed to occur 24/7. Realistically expected losses outside of operational hours and transfer of product would be minimal.
- A sensitivity analysis revealed that peak off-site emissions would occur in a north-westerly direction from the site as the local topography hinders dispersion. As such the stack has been positioned along the north-westerly side of the building in order to simulate a worst-case scenario.

7.4 IMPACT MODELLING

The AERMOD dispersion model was used for the prediction of potential off-site odour impacts. A year of meteorological data, described in Section 3.1, was obtained as input into the AERMOD dispersion modelling program. The data is considered representative of the wind climate at the subject site and study region in general and has been utilised as appropriate input into the model. Emissions from the proposed development can be considered to have been adequately represented using the modelling program.

7.5 IMPACT MODELLING RESULTS

Model results at receptors are given for acetic and formic acid in Table 7-1 and Table 7-2 respectively. Isopleths are provided as Figure 7-2 and Figure 7-3. Table 7-3 identifies the maximum off site impact.

Receptor	Impact (mg/m³)	Criteria (mg/m³)	Complies with Criteria (Y/N)	Odour Threshold (mg/m³)	Exceeds Odour Threshold (Y/N)
R1	0.00038	0.27	Y	0.02	N
R2	0.00022		Y		N
R3	0.00021		Y		N
R4	0.00021		Y		N
R5	0.00023		Y		N
R6	0.00022		Y		N
R7	0.00016		Y		N
R8	0.00013		Y		N
R9	0.00173		Y		N
R10	0.00026		Y		N
R11	0.00014		Y		N
R12	0.00013		Y		N
R13	0.00015		Y		N

Receptor	Impact (mg/m ³)	Criteria (mg/m ³)	Complies with Criteria (Y/N)	Odour Threshold (mg/m ³)	Exceeds Odour Threshold (Y/N)
R1	0.00092	-	-	12	N
R2	0.00053		-		N
R3	0.00051		-		N
R4	0.00051		-		N
R5	0.00055		-		N
R6	0.00052		-		N
R7	0.00039		-		N
R8	0.00030		-		N
R9	0.00415		-		N
R10	0.00062		-		N
R11	0.00033		-		N
R12	0.00032		-		N
R13	0.00037		-		N

Table 7-3: Modelled Impact Results at Boundary

Contaminant	Maximum Concentration Beyond Boundary (mg/m ³)	Coordinates	Criteria (mg/m ³)	Complies with Criteria (Y/N)
Acetic Acid	0.00236	299969.04, 6232588.26*	0.27	Y
Formic Acid	0.00564	299969.04, 6232588.26*		-

*Part of site occupied by 'Fastlane Karting Sydney'

7.6 DISCUSSION OF AIR IMPACTS

The modelled impacts for acetic acid over were below the specified ground level criteria at the nearest sensitive receptors. It is thus considered that emissions to air from the sites operation are unlikely to cause harm to human health or the environment.

Using acetic acid as a surrogate for all the other chemicals is a very conservative approach. Given that only acetic and formic acids are reasonable volatile whereas the other chemicals have negligible volatility, the acetic acid GLC are a factor of 10² below.

Results for both acetic acid and formic acid were also below the relevant odour detection threshold limits and thus odour impacts are not anticipated.

8. STATEMENT OF POTENTIAL AIR IMPACT

An air quality impact assessment was undertaken to assess the air emissions from the proposed operation of the chemical dilution and dispensing plant. The assessment was undertaken in accordance with the NSW EPA guidelines "Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales". Air emission impacts were quantified using the dispersion model AERMOD to determine whether or not exceedances to health-impact derived assessment criteria would occur at potentially sensitive receivers, being residential premises and a childcare centre. Conservative assumptions were utilised in the dispersion modelling inputs to ensure that worst-case impacts were simulated and evaluated. The dispersion modelling undertaken has shown that no exceedances to the air quality criteria for acetic acid were predicted.

The Handbook of Environmental Data on Organic Chemistry was used to identify the odour detection threshold concentrations for acetic acid and formic acid. Modelled results indicate that ground level concentrations would be unable to be olfactorily detected.

The assessment concludes that the proposal meets the most relevant and applicable air assessment criteria in accordance with the NSW EPA dispersion modelling guidelines and is expected to not cause any impact or harm to any of the nearest potentially affected sensitive land uses.

This concludes the report.



K Trahair
Environmental Scientist



R T Benbow
Principal Consultant



9. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

This report has been prepared solely for the use of Redox Pty Ltd, as per our agreement for providing environmental services. Only Redox Pty Ltd is entitled to rely upon the findings in the report within the scope of work described in this report. Otherwise, no responsibility is accepted for the use of any part of the report by another in any other context or for any other purpose.

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Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.

**FIRE SAFETY STUDY
FOR
REDOX PTY LTD
2 SWETTENHAM ROAD MINTO**

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EXECUTIVE SUMMARY

This Fire Safety Study (FSS) has been prepared by Benbow Environmental to assess the potential fire risk associated with the proposed changes to the operation of the Redox site, the following aspects warrant assessment in a fire safety study:

- Existing flammable liquid warehouse storage of flammable and combustible liquid in IBCs as the logistics industry is more widely using IBCs.
- Changes to the already approved stage IV of the development that increase the risk of fire, these being:
 - ▶ Food grade products to be delivered in bulk to the stage IV area of the site may include combustible liquids. These liquids would be decanted into small containers, drums and IBCs.
 - ▶ Class 8 corrosive substances to be diluted and decanted would include one with sub risks of flammability therefore increasing the risk of fire; another is C1 combustible and a food grade product, citric acid, is C2 combustible.
 - ▶ Products would also be transferred to ISO containers and bulk road tankers.

Fortunately when the site was initially approved the Department of Planning and Environment included a large number of safeguards that have proven to be very effective in avoiding hazards occurring and if a hazardous event did occur, safeguards that prevent an off-site hazard from occurring.

This Fire Safety Study deals with changes to the already approved Stage IV of the original development consent approved by the Minister for Planning.

The original design of this site reduced the risk of cumulative impacts through the following safeguards developed with officers of the then NSW Fire Brigade:

- Flammable and combustible liquids stored in isolated warehousing separated by distance and with 240/240/240 fire rated walls.
- A triple bunding for fire water containment was developed that also separated the site into several containment areas.

For the redesigned Stage IV development, reduction and removal of hazards is the design approach adopted rather than justify a level of risk. Minimising the risk is the design approach Redox have adopted.

The NSW EPA have considered the site to have an Overall Environmental Risk Level of 1.

The site has operated without any notifiable incident occurring since it commenced operations.

Redox have also had their Environmental Management rated at Category A which resulted in a 5% reduction in licensing fees.

There are very positive outcomes supporting the commitment Redox make with their operations.

The NSW EPA have also classified the Deltrex site at the same level of risk and the same Category for Environmental Management.



The Deltrex site at Girraween is owned by Redox and is the business that would be housed in the Stage IV development area. The FSS has been prepared to the guidelines outlined in the *Hazardous Industry Planning and Advisory Paper No 2 – Fire Safety Study Guidelines* (HIPAP No 2, Department of Planning and Environment (DoP&E NSW). These documents are widely applied across Australia.

The Fire Safety Study identifies the hazards relating to fire, resulting from the intended changes to the uses of the site. Assessments of the fire threats have then been undertaken and used to develop the fire prevention and fire protection strategy. Essential steps in this process that have been undertaken included:

- Examination of the heat loads from a fire involving flammable liquids;
- Examine incidences of fires and the causes in similar facilities;
- Examination of heat flux levels at adjoining premises and nearest residences;
- Examination of chemical exposure risks to off-site receivers from incomplete combustion; and
- Finalisation of the strategy for hazards to fire officers.

The outcome of this approach is a site that readily meets the risk hazard criteria of the Department of Planning and Environment.

The maximum quantities of chemicals to be stored are those as presented in Table 2-1 from the original EIS.

The maximum quantity of chemicals related to the Section 75W modification would be an increase from 250 T to 540 T.

The Section 75W modification is requesting that the range of chemicals allowed to be stored in bulk be varied as detailed in the application i.e. Class 3 in IBCs, C1 and C2 combustible liquids in IBCs, Class 6.1 PGIII in IBCs, Class 8 (sub risk 3) and food grade chemicals – non-dangerous goods as well as Class 8 corrosive liquids.

A handwritten signature in black ink, appearing to read 'R T Benbow'.

R T Benbow
Principal Consultant

Contents

Page

EXECUTIVE SUMMARY	I
1. INTRODUCTION	1
1.1 Scope of Report	1
1.2 Background to the Proponent	1
2. SITE DETAILS	3
2.1 Site Location	4
2.1.1 Description of the Site	4
2.1.2 Description of the Proposed Facility	10
2.1.3 Chemical Details	15
2.1.4 Production Quantities	19
2.2 Description of the Surrounding Area	19
2.2.1 Nearest Identified Sensitive Receptors	19
2.3 Chemicals and Dangerous Goods	23
2.3.1 Incident Management	27
2.3.2 Dangerous Goods Design Requirements	28
2.4 Site Characteristics	28
3. HAZARD IDENTIFICATION	30
3.1 Methodology	31
3.2 Hazard Identification	32
3.3 Hazard Analysis	32
3.3.1 Consequence Estimation	32
3.3.2 Probability Likelihood Estimation	32
3.3.3 Risk Evaluation and Assessment	32
3.4 Assessment Criteria	33
3.4.1 Individual Fatality Risk Levels	33
3.4.2 Injury Risk Levels	33
3.4.3 Risk of Property Damage and Accident Propagation	34
3.4.3.1 Heat-Flux Radiation Criteria	35
3.4.3.2 Explosion Over-Pressure Criteria	35
3.5 Lessons Learnt	36
3.5.1 Warehouse Activities	36
3.5.2 Fires Involving Tank Farms	39
3.6 Building Separation Distances	41
4. HAZARD IDENTIFICATION AND ASSESSMENT OF THE FIRE THREAT	42
4.1 Hazard Identification Charts	43
4.2 Hazards Identified for Further Analysis	52
4.3 Consequence Analysis – Heat Radiation	53
4.3.1 Scenario 1: Fire involving 5,000 kg of Class 3 flammable liquids at B1/B2	53
4.3.2 Scenario 2: Fire involving 30,000 kg of Class 3 flammable liquids at B1/B2	57
4.3.3 Scenario 3: Fire involving 600,000 kg of Class 3 flammable liquids at B1/B2	60
4.3.4 Scenario 4: Fire involving 100 kg of Class 8(3) liquids	62
4.3.5 Scenario 5: Fire involving 3,000 kg of Class 8(3) liquids	63
4.3.6 Scenario 6: Fire involving 10,000 kg of Class 8(3) liquids	65
4.3.7 Scenario 7: Fire involving 30,000 kg of Class 8(3) liquid	67
4.4 Consequence Analysis – Toxic Combustion Product Emissions	69

4.4.1	Complete Combustion	69
4.4.2	Incomplete Combustion	70
4.4.3	Scenario 8: Ground level concentrations from a fire involving 100 kg of Acetic Acid for a 2 m ² pool area	71
4.4.4	Scenario 9: Ground level concentrations from a fire involving 5000 kg of Acetic acid for a 30 m ² pool area	73
4.4.5	Scenario 10: Ground level concentration from a fire involving 30,000 kg of Acetic acid for a 30 m ² pool area	75
4.4.6	Scenario 11: Ground level concentrations from a fire involving 5,000 kg of Acetic acid for a 120 m ² pool area	77
4.4.7	Scenario 12: Ground level concentrations from a fire involving 30,000 kg of Acetic acid for a 120 m ² pool area	79
4.4.8	Scenario 13: Ground level concentrations from a fire involving 100 kg of Formic acid for a 2 m ² pool area	81
4.4.9	Scenario 14: Ground level concentrations from a fire involving 5000 kg of Formic acid for a 30 m ² pool area	83
4.4.10	Scenario 15: Ground level concentrations from a fire involving 30,000 kg of Formic acid for a 30 m ² pool area	85
4.4.11	Scenario 16: Ground level concentrations from a fire involving 5,000 kg of Formic acid for a 120 m ² pool area	88
4.4.12	Scenario 17: Ground level concentrations from a fire involving 30,000 kg of Formic acid for a 120 m ² pool area	90
5.	FIRE PREVENTION AND PROTECTION STRATEGY	93
5.1	Summary of Fire Safety Requirements	93
5.1.1	Characteristics of the Development	93
5.1.2	Potential Health Impacts due to Air Emissions from Fire Incident	93
5.1.3	Review of Fire Prevention and Protection Strategy	93
5.2	Discussion of Results	94
5.2.1	AS 1940–2004 The Storage and Handling of Flammable and Combustible Liquids	95
5.2.2	Building Classification and Construction	95
5.2.3	Ventilation	96
5.2.4	Ignition Sources	96
5.2.5	Security and Signage	96
5.2.6	Provision for Escape	97
5.2.7	Fire Detection	97
5.2.8	Fire Protection Equipment	98
5.2.8.1	Fire Hydrants	98
5.2.8.2	Fire Hose Reels	98
5.2.8.3	Fire Extinguishers	98
5.2.8.4	Piping and Pumping Systems	99
5.2.8.5	Cooling Water	100
5.2.8.6	Fixed Foam Systems	100
6.	CONTAINMENT OF CONTAMINATED FIREFIGHTING WATER	101
6.1	Identification of Materials and Hazards	101
6.2	Consequences of Contaminated Fire Water	101
6.3	Estimation of Potential Contaminated Firewater Volumes	101
6.4	Analysis of Contaminated Fire Fighting Water, Treatment and Disposal	102
7.	RECOMMENDATIONS	103

8. CONCLUSIONS	105
9. REFERENCES	106
10. LIMITATIONS	107

Tables	Page
Table 2-1: Comparison of EIS Quantities and Actual Quantities	16
Table 2-2: Nearest Potentially Affected Receivers Considered	20
Table 2-3: Characteristics of Chemicals	25
Table 3-1: Individual Fatality Risk Criteria	33
Table 3-2: Consequences of Heat Radiation	35
Table 3-3: Consequences of Explosion Overpressure	35
Table 3-4: Fire causes for warehouses storing flammable liquids from 2000-2005	36
Table 4-1: Event/Consequence Analysis Table	44
Table 4-2: Heat Radiation Distances for Scenario 1	54
Table 4-3: Heat Radiation Distances for Scenario 2	57
Table 4-4: Heat Radiation Distances for Scenario 3	60
Table 4-5: Heat Radiation Distances for Scenario 4	62
Table 4-6: Heat Radiation Distances for Scenario 5	63
Table 4-7: Heat Radiation Distances for Scenario 6	65
Table 4-8: Heat Radiation Distances for Scenario 7	67
Table 4-9: Scenario 8: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors	72
Table 4-10: Scenario 9: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors	74
Table 4-11: Scenario 10: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors	76
Table 4-12: Scenario 11: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors	78
Table 4-13: Scenario 12: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors	80
Table 4-14: Scenario 13: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors	82
Table 4-15: Scenario 14: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors	84
Table 4-16: Scenario 15: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors	86
Table 4-17: Scenario 15: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors	87
Table 4-18: Scenario 16: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors	89
Table 4-19: Scenario 17: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors	91
Table 4-20: Scenario 17: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors	92
Table 5-1: Standards for Portable Fire Extinguishers	99
Table 6-1: Required Containment of Contaminated Firewater	102

Figures

Page

Figure 2-1: Aerial Photograph of the Project Site Location and the Nearest Potentially Affected Receptors	5
Figure 2-2: Site Location—Local context	6
Figure 2-3: Site Plan	7
Figure 2-4: Dangerous Goods Locations	8
Figure 2-5: Bund location Limits (<i>from Figure 5.1, AS 3780</i>)	12
Figure 2-6: Overall view of the facility	14
Figure 2-7: Close up view of the food grade area	15
Figure 3-1: Fire percentage for different material	37
Figure 3-2: Fire Percentage due to different causes	37
Figure 4-1: Heat Radiation Contours for Scenario 1: Pool fire involving 5,000 kg of Class 3 flammable liquids in B1	55
Figure 4-2: Heat Radiation Contours for Scenario 1: Pool fire involving 5,000 kg of Class 3 flammable liquids in B2	56
Figure 4-3: Heat Radiation Contours for Scenario 2: Pool fire involving 30,000 kg of Class 3 flammable liquids in B1	58
Figure 4-4: Heat Radiation Contours for Scenario 2: Pool fire involving 30,000 kg of Class 3 flammable liquids in B2	59
Figure 4-5: Heat Radiation Contours for Scenario 3: Bund fire involving 600,000 kg of Class 3 flammable liquids	61
Figure 4-6: Heat Radiation Contours for Scenario 5: Fire involving 3,000 kg of Class 8(3) liquids	64
Figure 4-7: Heat Radiation Contours for Scenario 6: Fire involving 10,000 kg of Class 8(3) liquids	66
Figure 4-8: Heat Radiation Distances for Scenario 7: Fire involving 30,000 kg of Class 8(3) liquid	68
Figure 4-9: Scenario 8: Ground Level Concentration of Carbon Dioxide Isopleth	72
Figure 4-10: Scenario 9: Ground Level Concentration of Carbon Monoxide Isopleth	74
Figure 4-11: Scenario 10: Ground Level Concentration of Carbon Monoxide Isopleth	76
Figure 4-12: Scenario 11: Ground Level Concentration of Carbon Monoxide Isopleth	78
Figure 4-13: Scenario 12: Ground Level Concentration of Carbon Monoxide Isopleth	80
Figure 4-14: Scenario 13: Ground Level Concentration of Carbon Dioxide Isopleth	82
Figure 4-15: Scenario 14: Ground Level Concentration of Carbon Dioxide Isopleth	84
Figure 4-16: Scenario 15: Ground Level Concentration of Carbon Dioxide Isopleth	86
Figure 4-17: Scenario 15: Ground Level Concentration of Carbon Monoxide Isopleth	87
Figure 4-18: Scenario 16: Ground Level Concentration of Carbon Dioxide Isopleth	89
Figure 4-19: Scenario 17: Ground Level Concentration of Carbon Dioxide Isopleth	91
Figure 4-20: Scenario 17: Ground Level Concentration of Carbon Monoxide Isopleth	92

Attachments

- Attachment 1: Redox Minto Dangerous Goods Storage
- Attachment 2: Redox Girraween (Deltrex) Dangerous Goods Storage
- Attachment 3: Notification for Minto Site
- Attachment 4: Notification for Girraween Site





1. INTRODUCTION

This report provides the findings of a Fire Safety Study (FSS) for changes to the Stage IV operations of the Redox Minto site. The FSS has been prepared to the guidelines of the Department of Planning, outlined in the *Hazardous Industry Planning and Advisory Paper No 2 – Fire Safety Study Guidelines* (HIPAP No 2, Department of Planning and Environment (DoP&E), NSW). These documents are widely referred to for these studies across Australia.

This study includes an evaluation of potential fire incidents imposed on the site, the local business community and the residents. The study makes recommendations for fire fighting equipment necessary to reduce that impact and minimise risk of property damage and pollution. The fire protection strategy is based on the requirements stipulated by the National Code of Construction (NCC), relevant fire protection codes, relevant Australian Standards and the findings of a hazard analysis.

The site is located within the local government area of Campbelltown City Council. The Department of Planning and Environment is the Appropriate Regulatory Authority as the original development was State Significant. For the purposes of this report, Redox Minto will be referred to as the 'Site' from here on.

The site address is 2 Swettenham Road Minto NSW.

1.1 SCOPE OF REPORT

This FSS has been carried out in accordance with the *Hazardous Industry Planning and Advisory Paper No 2 – Fire Safety Study Guidelines* (HIPAP No 2, DoP&E 2011). This study evaluates potential fire risks imposed by the operation of the site on the surrounding environment and communities and makes recommendations on relevant fire prevention/protection strategies necessary to minimise the impact and risk of human fatalities, property damage and environmental pollution.

In the preparation and presentation of the FSS the following has been undertaken:

- Examination of process layouts, product storage compatibilities, various methods of reducing the hazard to fire officers and ensuring a viable warehousing facility for the Client;
- Review of the potential fire hazard of the Stage IV facility;
- Identification of areas of high fire risk;
- Hazard assessment of areas of fire hazard to form the premise of the fire safety study;
- Examination of fire causes in similar warehouses and tank farms;
- Calculate heat of radiation levels and ground level concentrations of incomplete combustion;
- Assess hazards to fire officers and Client employees; and
- Detail the required fire protection and control facilities for the Stage IV facility.

1.2 BACKGROUND TO THE PROPONENT

Redox markets a range of close to 1,000 different organic and inorganic raw materials, sourced from leading manufacturers throughout the world. Products are supplied to 140 different industries throughout Australia, New Zealand, Malaysia and the West Coast of the USA.



Starting as a small trader of speciality products in 1965, Redox has grown to become one of the largest privately owned chemical raw material importers and distributors in the Asia Pacific region.

Redox operate chemical storage and logistics sites across major capital cities. Redox have established a high standard of safety and environmental management and operate their sites free of any polluting incidents.

The Minto site has in place a Safety Management System that has served their operations well and enabled this site to be free of any incidents.

Redox purchased the operations of Deltrex. This continues to be operated at a Girraween site. These activities form the basis of the revised Stage IV operating area.

The Deltrex business would require a larger number of chemicals to be stored at the Stage IV development area than originally assessed.

The original consent allowed for 250 T of Class 8 corrosive substances in bulk. An analysis of what is required for the Deltrex business is 540 T stored in tanks. The PHA provides the details of the chemicals proposed to be stored in bulk, diluted, decanted and packaged.

The Redox Minto operations have been assessed for Overall Environmental Risk by the NSW EPA and have been given the lowest risk level of 1.

Redox have also had their Environmental Management rated at Category A which resulted in a 5% reduction in licensing fees.

There are very positive outcomes supporting the commitment Redox make with their operations.

The NSW EPA have also classified the Deltrex site at the same level of risk and the same Category for Environmental Management.

The Section 75W application will enable Redox to further assess the potential hazards of their activities on industry adjacent to their site and to residences west of the site. There would also be growth in the supply of products generated at the existing Deltrex site. The current annual production of 12,000 T per year could increase to 30,000 T per year.

The delay in installing the Stage IV development has been beneficial to Redox as it has enabled a larger market for chemicals used in the food industry to expand.

2. SITE DETAILS

The basis of the original development is a useful starting point to outline the proposed changes. It is now some 12 years since the original development on the site occurred.

The original development considered the following site operations:

- Product delivery;
- Storage of products;
- Re-packing packaging and bagging;
- Diluting and decanting from bulk;
- Product dispatch.

These were to proceed over four stages with the fourth final stage being the diluting and decanting from bulk of Class 8 corrosive substances. Bulk meaning tank storage.

The original proposal to undertake repacking, packaging and bagging did not proceed and is no longer in consideration for the immediate future of the site.

Products were originally envisaged as being delivered, stored, and dispatched in two forms:

- Packages, containers and IBCs; and
- Bulk.

The empty packages are cartons of product already brought to site in this form. These are on pallets and are stripped for transport.

Containers are usually 205 L steel and plastic drums.

Bulk consists of bulky bags for solid materials.

IBCs are referred to as tanks and are therefore now considered to be bulk.

In the original development application, no bulk storage was requested for Stages 1, 2 and 3 for flammable and combustible liquids.

This did not intend to mean no IBCs.

In more recent years use of IBCs has become more widespread. This is notable in the transport of Class 3 flammable liquids and C1 and C2 combustible liquids and has increased with the importing of the chemicals as old refineries in Australia close operations.

The storage and handling of IBCs for flammable and combustible liquids is currently not permitted on this site as the original EIS excluded bulk without this meaning to exclude IBCs and this restriction needs to be removed.

2.1 SITE LOCATION

The site is located at 2 Swettenham Road, Minto, NSW and is described as Lot 1711 in DP 1089572. The site is comprised of approximately 6.05 ha. The proposed site is located within the Campbelltown City Council Local Government Area. Figure 2-1 and Figure 2-2 show the location of the site in its local context. Shown on Figure 2-1 are nearest receiver locations R1 to R13 that are identified further in Sub-Section 2.2.1.

Figure 2-3 represents the site layout.

The site access is off Campbelltown Road then Swettenham Road from the northern end of Swettenham Road as there is no right hand turn into the site off Swettenham Road which is awkward.

The subject site was zoned 4(b) Industry in the 2002 LEP and is now zoned IN2 in the 2015 LEP.

Figure 2-4 shows the details of where the dangerous goods would be located as permitted by the SafeWork NSW Notification.

2.1.1 Description of the Site

The site is a flat plateau on the side of a relatively large ridge separating Bow Bowing Canal from the residential area immediately west of the site.

The site offices are located on the northern extent of the site while corporate offices are located off Swettenham Road at the opposite southern extent of the site.

Trucks principally enter and leave from the northern end of the site. The access from the southern entrance to the site has a tight turning circle and is relatively steep. This access is generally limited to site personnel and contractors in cars and vans.

The Stages 1, 2 and 3 consisted of warehouses.

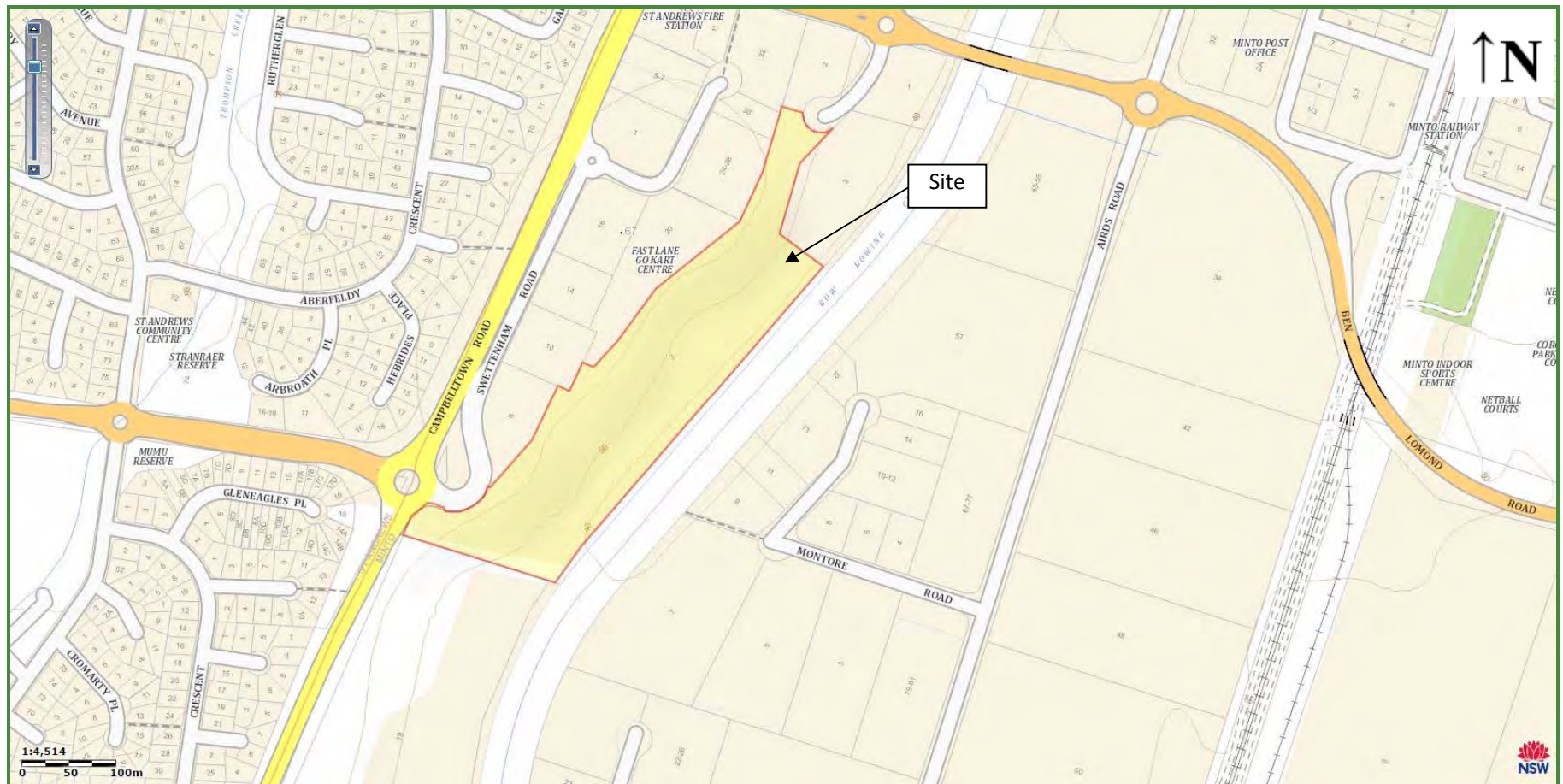
The warehouses are readily sighted on Figure 2-1 and Figure 2-3.

Figure 2-1: Aerial Photograph of the Project Site Location and the Nearest Potentially Affected Receptors



Source: <https://maps.six.nsw.gov.au/>

Figure 2-2: Site Location–Local context



Source: <https://maps.six.nsw.gov.au/>

OVERALL SITE PLAN 1:700

FIRST FLOOR PLAN 1:400

NORTH WEST ELEVATION 1:400

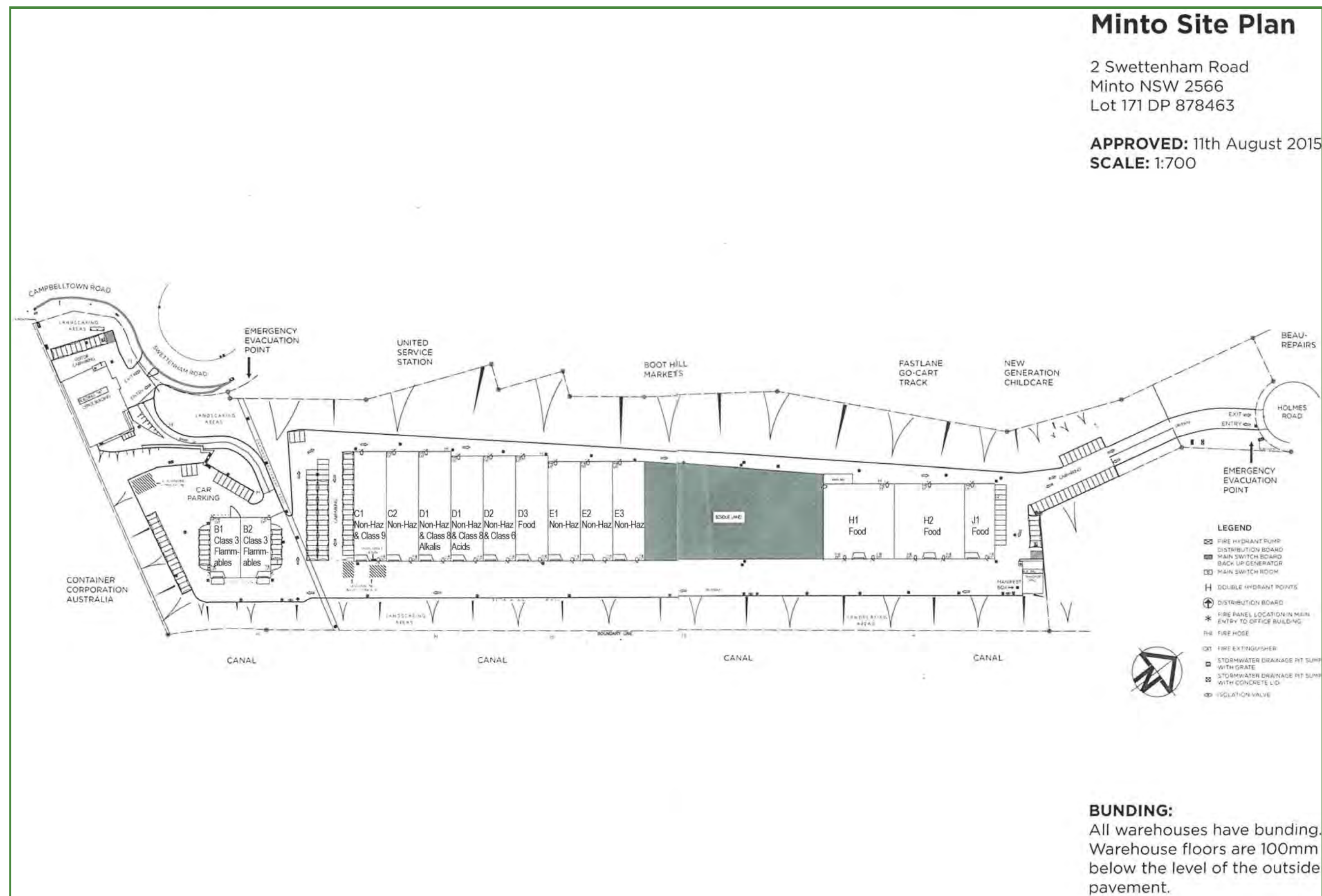
DEVELOPMENT DATA

SITE AREA	
61 819 M ²	

FLOOR AREAS	
BUILDING 1A OFFICE	500.00 M ²
BUILDING 1B OFFICE	900.00 M ²
BUILDING 1C OFFICE	97.83 M ²
BUILDING 1D OFFICE	3164.16 M ²
BUILDING 1E OFFICE	336.00 M ²
PROPOSED BUILDING 1F	1263.00 M ²
PROPOSED OFFICE 1P	119.50 M ²
PROPOSED AWNING 1Q	654.88 M ² + 954.50 M ²
Q/A TOTAL W/ HOUSE	15 083.85 M ²
Q/A TOTAL OFFICE	9 920.50 M ²
Q/A TOTAL AREA	17 985.85 M ²

CARPARKING	
REQUIRED OFFICE	9831 + 119.50 / 35 = 84.3
WAREHOUSE	1263.00 + 13 692.35 = 15 035.35
15 035.35 - 9000 M ² = 13 035.35 M ²	
9000 M ² / 100 = 90	
13 035.35 M ² / 250 = 52.14	
TOTAL REQD	= 55.44
PROVIDED	= 51

Figure 2-4: Dangerous Goods Locations





The warehouses are denoted by letters on the figure and this designation is used to describe the site.

The dangerous goods currently stored at Redox Minto, and Deltrex Girraween sites are presented in Attachment 1 and Attachment 2 respectively.

- Building A. This is the corporate headquarters for Redox and is at the southernmost extent of the site at the level of Campbelltown and Swettenham Roads.

Car parking is provided adjacent to the building.

The entry into the site at this end is for motor cars and vans only.

Emergency services may enter from this end however the turning circle is tight and would usually be avoided.

Security gates are provided at two location at this end of the site:

- ▶ Site perimeter fence; and
- ▶ Entry onto the road down to the warehouses.

Warehouses are at the reduced ground level of the site.

The designation of warehouses commences at the southern extent of the site.

- Building B1 and B2. These have fire rated construction and are specifically designed for flammable and combustible liquids.

Unloading and loading of product occurs from the eastern side of this building.

Ample clear space exists around Buildings B1 and B2 due to the need for isolation of areas where the storage of flammable and to a lesser extent combustible liquids occurs.

The design of the buildings is not discussed as these exist.

- Buildings C, D and E.

These three buildings are all adjoining each other.

These have awnings along the eastern side for unloading/loading during all weather conditions.

Awnings are cantilevered and have no columns at the request of the then NSW Fire Brigade.

The construction materials are concrete walls.

Each of the buildings have storage of specific Classes of dangerous goods and non dangerous goods.



The buildings store pallets, IBC's and bulky bags of chemicals in accordance with the Notification to SafeWork NSW.

Dangerous goods are located in SafeWork NSW approved storage areas. These were previously described as depots by WorkCover.

At the northern end of Building E, there is vacant land for an approved future development for Building H.

Its future use is for dangerous goods and non-dangerous goods.

To the north of this vacant land is where the production building for the decanting and blending operation would be located. This is designated as Building F.

- Buildings I and J. These are further warehouses to the north of the site and are for storage of dangerous and non dangerous goods.
- Building G. Building G is at the northern extent of the site. This is the site Office operations.

Trucks enter and leave from this end of the site accessing Holmes Road.

2.1.2 Description of the Proposed Facility

The site plan showing the redesigned Stage IV of the development is shown in Figure 2-3.

The figure shows the proposed warehouse Building H for pallet storage of non-dangerous goods.

Attachment 2 lists the dangerous goods currently used at Deltrex which would be brought to site.

The use of the adjoining building to the diluting, decanting and dispensing operations is deliberate as it reduces the risk of a fire being able to expose the contents of this building to levels of heat of radiation that would ignite flammable liquids or cause the evaporation of other Classes of dangerous goods. Similarly, the contents of Building H not containing flammable or combustible liquids, would have a low risk of being able to initiate a fire that would expose the bulk tank storage of Stage IV diluting and decanting area to significant levels of heat of radiation. These are methods by which cumulative impacts are avoided through design.

Each bulk tank would have a maximum storage capacity of 30,000 L. Each diluting/decanting tank would have a maximum storage capacity of 12,000 L.

A 240/240/240 fire rated wall would be constructed along the wall of warehouse H adjoining the diluting and decanting area. This along with the separation distance shown on this figure provides further protection from a "domino" effect. Further 240/240/240 fire rated walls are used to separate the three production areas. As noted above, the use of fire rated walls reduces the potential for cumulative hazards to arise.

Figure 2-3 shows the location of the three separate decanting and diluting areas. These may also be referred to as mixing areas.



- Alkali filling.

This area has four bulk storage tanks and three diluting/decanting mixing and blending tanks. An area for filling packages (typically 15-25 L capacity), containers (typically 180–205 L drums) and bulk tanks being IBCs (typically 1,000 L) is provided. It would also be possible to fill bulk tankers and ISO containers.

A 240/240/240 fire rated wall is at both ends of the alkali filling area.

There would be a packed bed scrubber for the alkali filling operation. This would capture and treat fume from the bulk storage tank vents and the diluting/decanting vessels.

A debugging operation would also enable flakes or powdered forms of alkali to be added into the diluting/decanting vessels. The debugging operation may also be used for the food grade production.

- Acid filling.

This area has three bulk storage tanks and three diluting/decanting mixing and blending tanks.

An acid filling area with similar operations as the alkali filling operations would be provided.

A 240/240/240 fire rated wall would separate the acid filling area from the food grade area (one would exist in the other direction as described above between the alkali area).

A packed bed scrubber would also be provided for the acid bulk storage tanks and the diluting/decanting vessels used to dilute the acids.

- Food grade products.

Two bulk storage tanks and two diluting/decanting vessels would be provided.

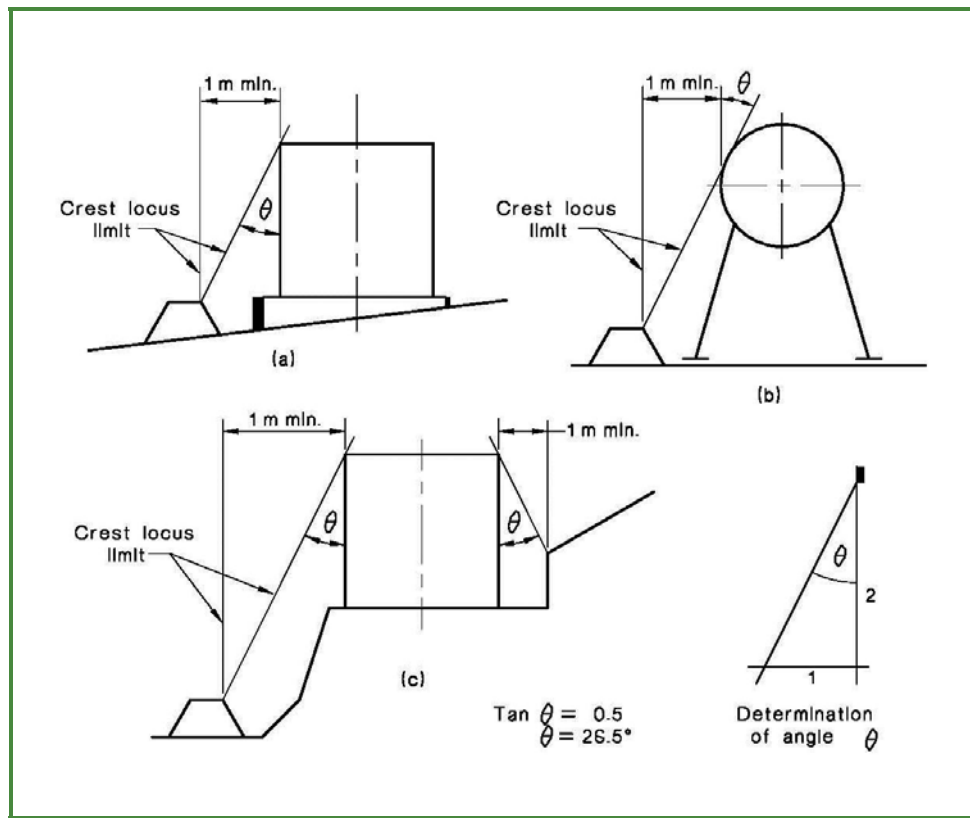
A fire rated wall separates this area from both the acid filling area (already described above) and the end of the Building F which would house the Stage IV diluting/decanting operations.

The food grade area is fully enclosed with fire rated walls and a roller shutter door so that it is sealed from the other areas of Stage IV.

The food grade filling operation would be within this enclosed space.

Each of the bulk storage tanks would be within bunded areas. Walls of suitable materials would be needed around the long sides of the bunds so that the crest locus limits in the Australian Standards AS 1940, and AS 3780 would be satisfied. The following diagram shows what this means, courtesy of AS 3780.

Figure 2-5: Bund location Limits (from Figure 5.1, AS 3780)



The bulk storage tank bunding volumes are based on 110% of a tank in each of the three separate “tank farms”.

This bund may not be shared with the diluting/dispensing vessels, i.e. alkali and acids as these are incompatible.

Each of the bundled areas and the two tanker unloading/loading areas will need to drain to separate sumps in the event of a spillage occurring.

Figure 2-3 shows building “F” to have the following features besides those already described.

A proposed curved awning runs the full width of the building. Ramps are shown with separation across the awning so that road tankers can park and unload with segregation between incompatible chemicals i.e. the alkali and acids.

Within the proposed covered awning area are the water – either a reverse osmosis or demineralisation – plant, and two water storage tanks. Demineralised water would be used in the diluting operations at the start of the operation of the facility. Reverse osmosis may be used in the future. Neither type of water cleaning process causes environmental hazards or generation of odours.



Adjacent to the water storage tanks in a separate area is the pH correcting water treatment plant. This plant collects washing and rinsing water from the diluting/decanting tanks and enables the water used for washing/rinsing to be neutralised to Sydney Water's requirements. The plant does not generate odour. The plant would be similar to the one operating at Deltrex and available for inspection.

Road tankers would enter, park and then depart in a forward direction through the covered awning area. The two separate bunded areas would drain to central sumps so that in the event of a spillage, the spilt liquid would be able to be pumped into the bulk storage tank for use or into the waste water treatment plant.

The tanker unloading areas may also be used to fill bulk tankers or ISO containers in the future. The extent of bulk filling of road tankers and ISO containers is not known and would be market driven. It may be 1-5 road tankers or ISO containers a week.

Building "F" would also have an area for dry debagging of bulky bags of alkali, a pallet storage area and a separately bunded and enclosed area for washing of IBCs.

The debagging area would enable sacks of alkali to be emptied into a hopper. The alkali are not combustible.

The hopper would use an auger to transfer the chemical into the respective diluting/decanting tank.

The need for this aspect is the production of dilute solutions of sodium and potassium hydroxide, urea and citric acid. There may be others.

Each of the receiving tanks have fume collection that would also capture dust.

The hopper receiving the contents of the sacks would have a dust hood that would be connected to either a small reverse pulse dust collector or to the respective scrubbers for the type of chemical being debagged i.e. alkali or food grade. Specialist advice on the types of packed bed scrubbers to be used is being received from Lab Systems Group of Melbourne who produce a range of packed bed scrubbers.

The pallet storage area would be a staging area for short term storage of product that has been decanted and is to be transferred into the respective dangerous goods storage warehouses on site. The pallet storage area could have pallets with 15, 20 or 25 L packages, or 200-205 L drums or IBCs stored waiting for transfer to the warehouses for the types of chemicals that are permitted to be stored in these warehouses.

Labelling of the pallet of packages/drums and placarding of the IBCs will ensure forklift drivers are aware of the contents.

Signage would be used to establish separate staging storage areas for alkali and acid based products, separate bunding of these areas is not warranted in the staging area and would detrimentally affect the productivity of the operations. There could be up to 20,000 L of product stored in the staging area.

Each of the bulk storage tanks would have the full set of level controls, alarms, and separate filling lines with bottom filling as required by the respective Australian Standards AS 1940 and AS 3780.

Tank materials would also be specified in compliance with requirements of these Australian Standards and as recommended in the expert report prepared by Lycopodium. Lycopodium prepared a Facility Upgrade Design Report which provides a detailed design of the Facility. This document contains proprietary information that should not be on the public register. The contents are available on request from a regulatory authority. This detailed information is in the Australian Standards and does not warrant inclusion in this document. Detailed construction drawings would be prepared prior to construction proceeding and would require review by a member of the Australasian Institute of Dangerous Goods Consultants (AIDGC).

Each bulk storage tank would be individually placarded in accordance with the Work Health and Safety Regulation 2017. Each tank would be given a tank number or letter. Tanks with conical bottoms and fixed roofs would be used. Tanks would have diameters of 3 m and typical heights of 4.5 m.

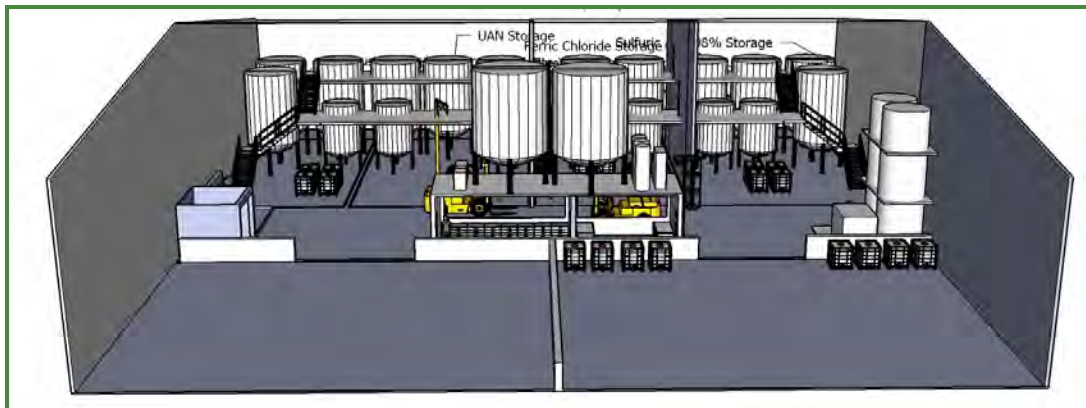
Each pipeline would have direction of flow arrows and labelling.

At each bulk tank connection point for filling would be signage indicating the tank identification number or letter the filling point connects to and what the contents of the tank are.

The following schematic diagrams illustrate what the facility would look like.

Figure 2-6 provides an overall view of the facility. The number of tanks shown may vary from the site plan which is the facility as proposed.

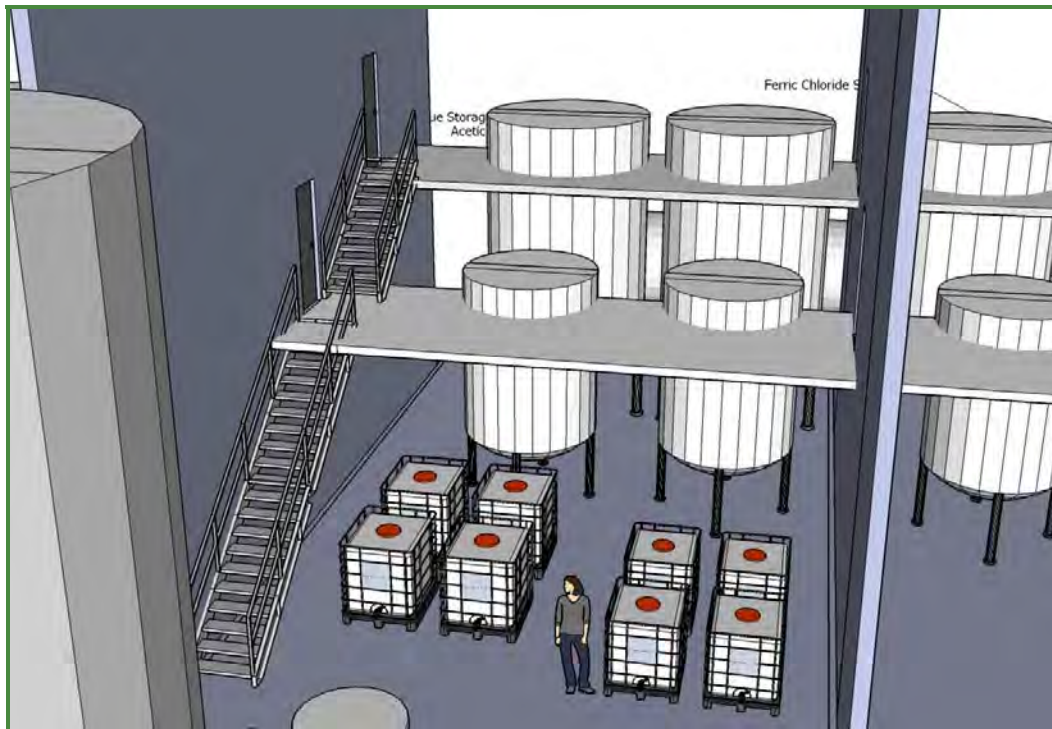
Figure 2-6: Overall view of the facility



The two large tanks shown in the middle of the diagram are the purified water storage tanks from the operations of a demineralised water plant that may in the future be updated to reverse osmosis.

Figure 2-7 provides a closer view of the food grade area.

Figure 2-7: Close up view of the food grade area



Redox personnel are present at all times when a bulk tanker is to deliver chemical and the tanker driver would be supervised. These aspects would need to be written into a set of work practice procedures that would be needed as part of an expanded Safety Management System for the site. Redox have already in place an extensive set of work practice procedures.

A similar practice would be in place for filling road tankers and ISO containers.

Within the acid bulk storage tank area and the acid mixing area, chemicals would be used that have a sub risk characteristic of flammability to ADGC Class 3 PGII and GHS Flammability Category 2. Another has combustibility to C1 and GHS Flammability Category 4 i.e. Class 8(3) and Class 8 with combustible C1.

One of the food grade chemicals is combustible C2.

Hazardous zones for explosion and fire would exist in these areas. Prior to construction hazardous area zoning diagrams would be required. These areas would also need preparation of Dossiers of the method of explosion protection used. This detail is required for construction rather than for assessment of the proposed development.

2.1.3 Chemical Details

The maximum quantities of chemicals to be stored are those as presented in Table 2-1 from the original EIS.



The maximum quantity of chemicals related to the Section 75W modification for the Stage IV Class 8 bulk is specified in the table i.e. 250 T of bulk. With the success of the Deltrex operations this quantity would need to be increased to 540 T.

The Section 75W modification is requesting that the range of chemicals allowed to be stored in bulk be varied as detailed in the application i.e. Class 8 (sub risk 3) and food grade chemicals – non-dangerous goods as well as Class 8 corrosive liquids. Chemicals proposed to be stored are listed below.

To assist the Department of Planning and Environment a comparison between the quantities of dangerous goods stored as detailed in the original Environmental Impact Statement and the quantities actually stored are presented in Table 2-1 below.

Table 2-1 from the original EIS is reproduced below:

Table 2-1: Dangerous Goods to be Stored at the Site		
Chemical Class	Tonnage	% of total
Non Dangerous Goods	15,795	77.3%
Class 3 (Flammable)	900	4.4%
Class 5.1 (Oxidizing)	250	1.2%
Class 6.1 (Toxic)	850	4.2%
Class 8 Packages (Corrosive)	2,400	11.7%
Class 8 Bulk (Corrosive)	250	1.2%
Total	20,445	100.0%

The EIS listed which buildings would store what Classes of dangerous goods. There have been changes made in the locations used in practice and as the site has been independently audited several times the background to this aspect is not discussed further as it has little relevance to the need for the Section 75W. The current quantities of dangerous goods based on the actual quantities stored on the WorkCover Notification are the following.

The actual quantities being stored based on the SafeWork NSW Notification, are the following:

Table 2-1: Comparison of EIS Quantities and Actual Quantities

	EIS	Actual
Class 3	~~500-900~~ T	~~15-20~~ T
Class 5.1	250 T	5 T
Class 6.1	850 T	150 T
Class 8 <u>packages</u>	2,400 T	~~1,284-51,331~~ T
<u>Class 8 bulk</u>	<u>250 T</u>	<u>None</u>

Although the actual quantities are less than those approved in the EIS, these quantities are not to be reduced as a result of the Section 75W application.



The original EIS detailed the quantity of Class 8 corrosive liquids in bulk to be stored was 250 T.

The current quantity of Class 8 (3) and Class 8 corrosive liquids currently stored in bulk at the Girraween site is 74 T.

The approved quantity of 250 T in bulk is requested to be increased to 540 T. The subject of the Section 75W application is to allow the following at Area F – described as the Tank Farm.

- Allow Class 8 sub risk 3 corrosive liquids;
- Allow non-dangerous goods – food grade chemicals – to be stored in bulk and be decanted.

Other than the Class 8 corrosive liquids to be stored and decanted at Area F, the original EIS specified that acetic acid, a Class 8 (sub risk 3) corrosive liquid would be amongst these chemicals.

The Section 75W application desires to clarify the types of Class 8 chemicals to be stored in bulk by providing the detail in this document and allowing the now detailed design of Area F to be approved.

It is further reinforced that there are no changes to the existing dangerous goods and non-dangerous goods storage quantities or Class of dangerous goods to be stored. The limitations in the development consent as reproduced below remain in place.

The following table is reproduced from Section 4 Environmental Performance of the original consent:

Dangerous Goods Class	Prohibited	Permitted
Class 1	All	None
Class 2	All	None
Class 3	Packaging group I Subclass 6.1	Packaging groups II and III (unless otherwise prohibited)
Class 4	All	None
Class 5	All except those listed as permitted	Solids of class 5.1, packaging group III
Class 6	Subclass 3 All Class 6.2	All Class 6.1 (unless other, but not class 6.1 with subclass 3)
Class 7	All	None
Class 8	None	All
Class 9	None	All
Non-dangerous goods	None	All

The following is to be noted:

The Section 75W application does not extend to allowing any bulk chemical other than Class 8, Class 8 (sub risk) and food grade chemicals which may be non-dangerous goods. One of the Class 8 acids is also C1 combustible.

No Class 3, Class 5.1, Class 6.1 dangerous goods would be stored or decanted at Area F.



Therefore the preliminary hazard analysis and the fire safety study do not consider any hazards associated with the above dangerous goods as none would be permitted in Area F. It does consider the consequences of the sub Class 3 acid combustible C1 in detail.

The above table from the development consent did not prohibit Class 8 sub risk 3 dangerous goods. Redox have made the 75W application to ensure they are fully complying with the original consent which did not specifically address Class 8 (sub risk 3) dangerous goods being stored and decanted. It follows that other sub risk Classes e.g. Class 8 (sub risk 5.1) or Class 8 (sub risk 6.1) would not be stored or decanted.

The following are the chemicals that may be used in the proposed Stage IV operations.

The information is presented separately for the three “families” of chemicals being acids, alkali and food grade.

• Acids.			
Phosphoric acid	Class 8 PGIII	UN1805	79-95 wt%
Sulphuric acid	Class 8 PGII	UN1830	70 wt% and 98 wt%
Ferric chloride	Class 8 PGIII	UN2582	30-60 wt%
Formic acid	Class 8 (3)PGII	UN1779	85 wt%
Fluorosilicic acid	Class 8 PGII	UN1778	27 wt%
• Alkali.			
Sodium hydroxide	Class 8 PGII	UN1823 solid	99 wt%
		UN1824 liquid	50 wt%
Potassium hydroxide	Class 8 PGII	UN1813 solid	90 wt%
		UN1814 liquid	50 wt%
Hypochlorite solution	Class 8 PGIII	UN1791	12-15 wt%
• Food grade.			
Acetic acid	Class 8 (3) PGII	UN2790	75 wt%
		UN2789	90-95 wt%
Citric acid	Non DG	C2 combustible liquid	
Urea ammonium nitrate	Non DG		

Phosphoric acid in food grade may also be diluted in the food grade area of the facility.

The above list is the majority of the chemicals to be used but flexibility is needed to allow other chemicals with similar characteristics to be processed especially as the processes are limited to simple diluting and decanting.

As specific chemicals are diluted with water, excess heat would be generated. Sulphuric acid and sodium hydroxide both exhibit this characteristic.

To control the temperature a heat exchanger would be used. A cooling tower would provide the source of cooling. The cooling tower would be located outside of the building.

No chemical reactions would occur. The processes used are simple diluting and decanting.



Incompatible chemicals are present and are segregated by establishing the separate “tank farms” and separate mixing and decanting areas. This segregation and the use of labelling, signage and having the presence of Redox personnel during deliveries of the chemicals will reduce the risk of mixing of incompatible materials to a minimum.

2.1.4 Production Quantities

The production quantities are based on the following estimates provided by the Proponent.

The bulk tanks are each of 30,000 L storage.

A bulk tank of a particular chemical could require refilling on a 24 hour basis.

The mixing tanks would hold 12,000 L of chemical.

The average time taken for a mix to be prepared would be 2–3 hours.

There could be 3-6 mixes occurring simultaneously in the eight mixing tanks.

The current level of production is 35,000 L/day.

It is envisaged that the production level could initially double and gradually increase to 100,000 L/day.

These daily production levels equate to 12,000 T per annum at the current production level and increasing to 30,000 T per annum.

2.2 DESCRIPTION OF THE SURROUNDING AREA

The surrounding area is residential to the west of Campbelltown Road and this road provides a clear division between residential land use and commercial/industrial.

The nature of the land uses in the commercial/industrial areas has not altered significantly. There are no new chemical plants or sites with chemicals that could cause “domino” effects.

The site’s eastern boundary is shared with Bow Bowing Canal. The land between the site’s eastern boundary and the canal has been landscaped.

Other residential areas are remote from the site to the distant east and north east.

The M5 is to the west of the site as shown in Figure 2-2.

Traffic ramps have been provided since the Redox site gained approval and a traffic engineer’s study has recommended greater flexibility in the truck routes from the Redox site.

2.2.1 Nearest Identified Sensitive Receptors

The following residences and sensitive receivers were considered as the nearest receptors for the assessment.

Table 2-2: Nearest Potentially Affected Receivers Considered

Receptor ID	Address	Lot & DP	Approx. Distance from Proposed Development	Current Use
R1	30 Swettenham Road, Minto	Lot 12 DP 834139	195 m N	Childcare Centre
R2	38 Galloway Crescent, St Andrews	Lot 1 DP 876582	430 m N	Residential
R3	22 Galloway Crescent, St Andrews	Lot 9 DP 876582	325 m NW	Residential
R4	10 Earn Place, St Andrews	Lot 313 DP 261631	265 m NW	Residential
R5	6 Coll Place, St Andrews	Lot 294 DP 261631	240 m W	Residential
R6	18 Hebrides Place, St Andrews	Lot 282 DP 261631	330 m SW	Residential
R7	12 Kintyre Place, St Andrews	Lot 111 DP 263022	505 m SW	Residential
R8	4 Wick Place, St Andrews	Lot 339 DP 260428	680 m SW	Residential
R9	20 Swettenham Road, Minto	Lot 2 DP 834139	85 m N	Private Recreational
R10	3 Holmes Road, Minto	Lot 172 DP 878463	145 m NE	Industrial
R11	57 Airds Road, Minto	Lot 12 DP 1076508	175 m E	Industrial
R12	13 Montore Road, Minto	Lot 6 DP 1076508	115 m SE	Industrial
R13	9 Montore Road, Minto	Lot 4 DP 1076508	145 m S	Industrial

As noted earlier, Figure 2-1 provides an aerial photograph of the site and the nearest sensitive receptor locations.

The site is an established industrial site.

The site exists and has operated for the past 12 years free of any adverse environmental impact or pollution incident.

The site stores non dangerous goods as well as limited Classes of dangerous goods in keeping with the original development.

At present the WorkCover Notification lists the following Classes of dangerous goods and quantities of the following classes. A brief description of each Class is provided to assist the reader not familiar with dangerous goods.

Class 3



Flammable liquids.

Flammable liquids and the other remaining classes are divided into three further descriptions depending on the characteristics of the dangerous goods – PGI, PGII or PGIII.

PG stands for packing group.

The level of danger diminishes from PGI to PGIII.

PGI represents great danger e.g.: ether.

PGII represents medium danger e.g.: acetone, petrol.

PGIII represents minor damage e.g.: kerosene, turpentine.

The storage of Class 3 flammable liquids requires a detailed assessment and safeguards are numerous. Reference to AS 1940—2017 provides detailed guidance on storage and use and handling of flammable and combustible liquids. Combustible liquids are placed into either of two Classes; Class C1 or C2. An example of C1 is diesel; C2 examples are cooking oil and lubricating oil.

Class 5.1



Oxidising substances.

These provide a source of oxygen. Examples are perchloric acid, ammonium nitrates.

These substances are also highly reactive with other classes of dangerous goods such as acids, alkali. Main safeguard is to provide segregation.

Class 6.1.



Toxic substances.

These are poisonous substances and a number of safeguards are required for their storage, use and handling. Disposal of empty containers is also a critical issue. Preventing contamination of work surfaces and long-term soil or groundwater contamination are important issues. Environmental damage from spillage is a key issue requiring safeguards and training.

Class 8



Corrosive substances.

There are large families of these that are commonly encountered. Acids and alkali both being reactive belong to Class 8 and need special care.

Class 8 substances can be reactive with other Classes such as Divisions 5.1, 5.2 and 6.1. Safeguards are detailed. AS 3780—2008 provides a comprehensive set of guides.

Class 9



Miscellaneous substances.

This Class is becoming more frequently encountered and an Australian Standard provides guidance on storage use and handling



The following quantities of dangerous goods are usually on site.

Class 3	Packing Group II	5 T	
	Packing Group III	15 T	
Class 5.1	Packing Group III	5 T	
Class 6.1	Packing Group III	150 T	
Class 8(3)	Packing Group II	55 T	These would be in bulk in the Stage IV development
	Comprised of Formic acid	40 T	
	Acetic acid solution	15 T	
Class 8	Packing Group II	876 T	
	Packing Group III	345 T	

The chemicals currently used at the "Deltrex" Girraween operation that would be relocated to the Minto site include the following. Many are already present on the Minto site.

Class 3		Nil
Class 5 (6.1)	Packing Group III	4.7 T
Class 5.1 (8)	Packing Group II	6.6 T
Class 8	Packing Group II	707 T
Class 8 (3)	Packing Group II	1.4 T
Class 8	Packing Group III	622 T
Class 8 (C1)	Packing Group III	12.8 T
Combustible liquids C1		23 T

The following chemicals within this above summary are already on the Minto site:

- Acetic acid;
- Formic acid;
- Hydrochloric acid;
- Sulphuric acid;
- Phosphoric acid;
- Potassium hydroxide; and
- Sodium hydroxide.



New chemicals to Minto are the following:

Urea Phosphate	Class 8	Packing Group III	4.8 T
Hypochlorite Solution	Class 8	Packing Group III	35 T
Fluorosilicic acid	Class 8	Packing Group III	70 T
Ferric Chloride	Class 8	Packing Group III	30.7 T

There are specific chemicals at the Girraween site that would not be brought to the Minto site under Clause 4.1 of the 2002 Consent:

Class 5 1(6.1)	Packing Group II
Class 5.1	Packing Group II

By examining this information it can be seen that the Stage IV development as now proposed would not be bringing chemicals to the Minto site that are significantly different to what are already on site.

A main difference is that the chemicals would be brought in bulk. The quantity brought in bulk is much less than the quantity already on site in containers.

For example, formic acid is present based on the SafeWork notification at a quantity of 40 T.

A bulk storage would be 30 T.

Acetic acid currently 15 T on site in containers would be 30 T in bulk.

Hence the conclusion can be reached that the chemicals being added to the Stage IV operation will not be new to the site but would be handled in bulk.

The handling of chemicals in bulk under controlled conditions requires less handling and less opportunity for human error. The main aspects to be considered are the consequences of major spillages, incorrect mixing of incompatible and react dangerously chemicals and the consequences of a fire on the existing Minto facility.

2.3 CHEMICALS AND DANGEROUS GOODS

The facility would not be considered to be a *Major Hazard Facility* as the chemicals to be stored on-site do not exceed the thresholds outlined in the Dangerous Goods Regulations relating to Major Hazard Facilities.

Storage of chemicals at the facility will be in accordance with the requirements of the *Work Health and Safety Regulation 2017* as well as following Australian/New Zealand Standards:

- AS 1940–2017 *The storage and handling of flammable and combustible liquids*;
- AS/NZS 3833:2007 *The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers*; and
- AS 3780–2008/Amdt 1–2009 *The storage and handling of corrosive substances*.



The site operates an extensive dangerous goods and non-dangerous goods storage and logistics business with an extensive set of safeguards that have proven to be very effective over the past 12 years' of operation.

The installation of the Stage IV development in today's environment will not require many new safeguards for the site as those that are existing are best practice even for today.

The design of the Stage IV development however will benefit from inclusion of additional safeguards that would not have necessarily been required 12 years ago and these mainly relate to fire containment and reduction in human factors in causing an incident to occur.

These additional safeguards are the more extensive use of fire rated walls and bunding so that containment of a pool fire, and preventing the spread of a fire are more easily contained by the design of the facility and allow Fire and Rescue NSW greater time in bringing an emergency incident under control.

The characteristics of the chemicals now proposed to be diluted and decanted are different from the original Class 8 corrosive substances. There is also the need to now include food grade products.

The characteristics of the chemicals of most relevance are vapour pressure and flash point for chemicals that are flammable or combustible.

The propensity for release of pungent fume/odour that would have an adverse effect of fire officers and more distant potential receivers during an emergency has been considered by using the air quality assessment to predict ground level concentrations of uncontrolled release of formic and acetic acid during spillages, heat of radiation causing fume to be release or during incomplete combustion during a fire.

The majority of sites have terrain which can be considered flat for distant receivers and products of combustion are usually not incident at ground level.

However, the Minto site is located adjoining a sharp relief and during an emergency incident with breeze or wind from the easterly sectors, a plume could be incident within the residential area located on the western side of Campbelltown Road.

The findings of this part of the assessment is provided in the preliminary hazard analysis.

The following table present the characteristics of the chemicals proposed to be stored, diluted and decanted. Water leads the table as a reference for vapour pressure.

Table 2-3: Characteristics of Chemicals

Chemical	Vapour Pressure at °C	Flash Point	Pungency and Odour	Flammable or Combustible	Toxic combustion	Incompatible	Risk rating for off-site impacts
Water	24 mm Hg @ 25°C						
Phosphoric acid Class 8 PGIII UN1805	0.03 mm Hg @ 20°C 43 mm Hg @ 25°C	Not relevant	Slight acidic odour	No	Oxides products of phosphorus	Alkali Sulphuric acid Water	Low
Formic acid Class 8(3) PGII UN1778, 1779	35 mm Hg @ 20°C 43 mm Hg @ 25°C	69°C Depends on % strength ¹	Highly pungent	Combustible C1	Carbon monoxide Acrid smoke Irritating fumes	Alkali Sulphuric acid	Moderate
Acetic acid Class 8(3) PGII UN2789, 2790	11.4 mm Hg @ 20°C 15.7 mm Hg @ 25°C	39°C	Highly pungent	Flammable	Irritating fumes	Violent reaction with alkali Incompatible with strong acids	Moderate
Ferric chloride Class 8 PGIII UN1830	Negligible at ambient conditions	Not relevant	Slight odour similar to hydrochloric acid	No	Toxic fumes of hydrogen chloride	Reacts with sulphuric acid to produce toxic gases	Moderate
Sulphuric acid Class 8 PGIII UN1778	Negligible at ambient conditions	Not relevant	Very slight acidic odour	No	Toxic fumes of sulfur oxides	Alkali Acetic acid Ferric chloride Fluorosilicic acid	Low
Fluorosilicic acid Class 8 PGII UN1778	22 mm Hg @ 25°C	Not relevant	Pungent	No	Toxic fumes of fluoride	Alkali Sulphuric acid Water	Low
Citric acid Non DG	Negligible	100°C	Odourless	Combustible C2	Acrid smoke Irritating fumes	Alkali	Low to negligible

Table 2-3: Characteristics of Chemicals

Chemical	Vapour Pressure at °C	Flash Point	Pungency and Odour	Flammable or Combustible	Toxic combustion	Incompatible	Risk rating for off-site impacts
Hypochlorite solution Class 8 PGIII UN1791	12-17 mm Hg @ 20°C	Not relevant	Slight chlorine (bleach) odour, disagreeable.	No	Toxic fumes of hydrogen chloride and sodium oxide	Acids with generation of toxic gas chlorine	Low
Sodium hydroxide Class 8 PGII UN1823, 1824	Nil at ambient conditions	Not relevant	Odourless	No	Toxic fumes of sodium oxide	Water Acids	Low
Potassium hydroxide Class 8 PGIII UN1813, 1814	Nil at ambient conditions	Not relevant	odourless	No	Toxic fumes of potassium oxide	Water Acids	Low
Urea ammonium nitrate Non DG	Nil	Not relevant	odourless	No	Not relevant	None	Negligible

Note: ¹Flash point also reported as 50°C at 90% aqueous solution so dependent on strength of the solution.

The above list is the majority of the chemicals to be used but as noted earlier flexibility is needed to allow other chemicals with similar characteristics to be processed through the diluting and decanting steps.



The characteristics that are of most relevance to be considered in the design of the facility to prevent off site amenity or hazard effects are the following:

- Vapour pressure would readily allow for fumes to be released. A vapour equal to or higher than the vapour pressure of water means that the chemical will readily be released from the surface of the liquid.

Formic acid and acetic acid have such levels of vapour pressure and the fumes released are pungent.

- Flammability.

Formic acid and acetic acid have flash points that allow the vapours to ignite in presence of an ignition source or source of heat.

- React dangerously or incompatible.

The table shows there to be many of the chemicals that are not to mix or come into contact.

This characteristic is well understood by Redox and the basis of the design of their facility has been to provide the following safeguards which would prevent mixing of incompatible chemicals being a credible event.

Separate storage tank areas are provided, with separate bunding, separate tanker unloading areas and separate diluting/decanting systems.

For an emergency event further safeguards consisting of fire rated walls have been provided.

Environmental factors have been addressed in relation to the design of the facility. These are discussed in the following sections.

2.3.1 Incident Management

The proposed facility will provide environmental safeguards and equipment to reduce the likelihood and severity of a pollution incident and a/or a fire emergency, these include:

- Bunding;
- Stormwater isolation;
- Fire services;
- Spill control procedure;
- Training; and
- Design to AS 1940, AS 3780 and AS/NZS 3833.

The Fire Safety Study focuses on fire incidents relating to fire are summarised from the Hazard Analysis provided in Section 3.

2.3.2 Dangerous Goods Design Requirements

The site would be designed to conform to the *Work Health and Safety Act 2011*, *Work Health and Safety Regulation 2017*, and relevant Australian Standards.

All dangerous good storage and handling practices would comply with:

- *Work Health and Safety Act 2011*;
- *Work Health and Safety Regulation 2017*;
- *Dangerous Goods (Road and Rail Transport) Act 2008*;
- *Dangerous Goods (Road and Rail Transport) Regulation 2009*;
- *How to Manage Work Health and Safety Risks Code of Practice 2011*;
- *AS 1940–2017 The Storage and Handling of Flammable and Combustible Liquids*;
- *AS 3780–2008 – The Storage and Handling of Corrosive Substances*;
- *AS/NZS 3833:2007 – The Storage and Handling of Mixed Classes of Dangerous Goods in Packages and Intermediate Bulk Containers*;
- *AS/NZS 4452:1997 – The storage and handling of toxic substances*;
- *AS/NZS 4804:2001 – Occupational Health and Safety Management Systems – General Guidelines on Principles, Systems and Supporting Techniques*;
- SafeWork Australia – National Standard for the Storage and Handling of Dangerous Goods [NOHSC:1015 (2001)];
- SafeWork Australia – National Code of Practice for the Storage and Handling of Dangerous Goods [NOHSC:2017 (2001)];
- *How to manage risk of hazardous chemicals (N.S.W. Code of Practice provided as guidance until approved in 2012)*;
- *Globally Harmonised System of Classification and Labelling of Chemicals 6th Revised Edition (2015)*;
- *Guidance on the Classification of Hazardous Chemicals under the WHS Regulations*;
- Safe Work Australia ISBN 978-0-642-78340-0; and
- Australian Dangerous Goods (ADG) Code 7th Edition.

Dangerous goods would be stored based on their compatibilities. Incompatible substances would be segregated in accordance with AS 3780–2008 and AS/NZS 3833:2007.

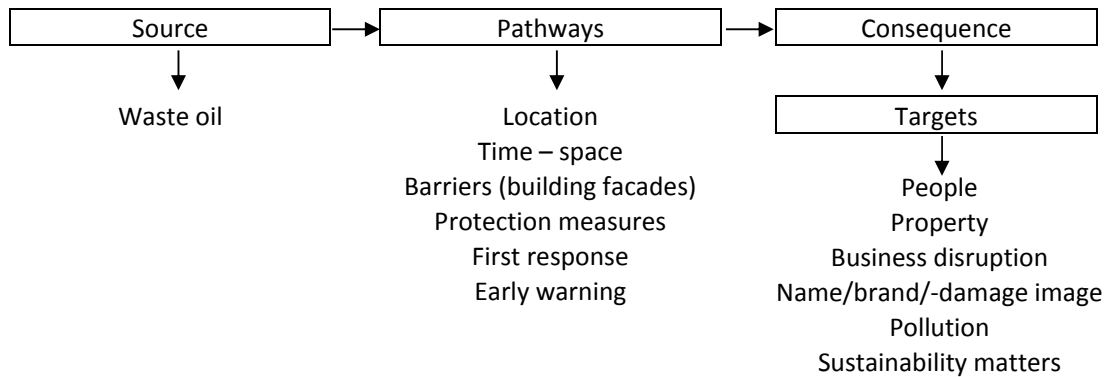
2.4 SITE CHARACTERISTICS

The specifics of the site location have been detailed in Section 2.

The nature of the fire threat is dependent on the type of fuel and its burning characteristics. There have been major fires involving outdoor oil storage tanks and the intensity of the fires is significant and has resulted in destruction of property.

These fires have been very difficult to control and often require many hours of fire fighting efforts – in excess of 18 hours.

In undertaking the hazard identification and assessment of the fire threat, the following are examined:



An examination of this logic diagram shows that although the sources of the fire may be a simple common materials, the consequences would be very significant.



3. HAZARD IDENTIFICATION

The purpose of hazard identification is to enable the definition of the extent of the engineering solutions that will be required to be determined. The engineering solutions involve the Fire Safety Study following a methodology as outlined below.

- Undertake a preliminary risk screening and a ranking of the events that could give rise to a fire.

For the event that could occur the outcomes need to be assessed for the potential consequences that may result.

The factor that could propagate a fire in this instance is a deviation in the operating parameters.

For the processes being undertaken, consideration is given to both the external activities as well as those being conducted inside the building.

The main internal activities involve the transfer of chemicals to storage tanks then blending tanks, and the loading of the finished products into bulk road tankers and decanting into a range of packages and containers for delivery off-site.

Certain of these operations generate heat but unless there is an equipment malfunction, the chemicals are not exposed to temperatures that would cause auto ignition or be at the chemical's flash point. The temperatures required for ignition and parameters that would cause a fire to occur were discussed in detail in Table 2-3 under the column "Flash Point".

- Release of material

The activities involve transferring various liquids. Specific ones such as acetic acid and formic acid, have flash points that are equal to a high ambient temperature or well above ambient temperatures usually experienced. The generation of a flammable liquid mist that would enable a cloud to be formed is prevented by maintenance of the pumping systems. Risk of fire with the proposed site activities is relatively low. Fire equipment for a first response is readily available consisting of fire extinguishers, hose reels with foam connected, hydrants able to connect to foam. These measures are discussed in more detail in Section 4.

- Ignition – Immediate, or delayed

An examination of the means of igniting the liquids finds that there are characteristics present that will enable the fire to spread if it occurs within the bund. As it is liquid, the rate of spread will initially be slow as sufficient heat is needed to vaporize the volatile compounds and generate release of vapour. Once the vapour is ignited, flame height will expose the whole of the surface of the nearby tanks to intense heat that will cause the tanks to fail, releasing more liquid into the bund. Hence the strategy of providing fire rated walls to prevent cumulative impact.

The bund has ample space so that oxygen will be immediately available. The bund volume means that once a fire erupts there will be rapid growth within the bunded area extending over the surface of the bund. These characteristics lead to the need for further fire services and the intermediary bunding (also full height to act as a fire isolating wall) between adjoining tank storage areas.



- Energy release – Rate of heat release

The rate of initial release of vapour that can be ignited is slow and this benefits the ability to be able to have an effective first response. The sub risk 3 is equivalent to a PGIII flammable liquid; the two chemicals that are also combustible also need to be subjected to heat to cause vapour to be released that may have the potential to be ignited. No heat is applied to these two chemicals or the formic and acetic acids under normal operations.

Awareness of a fire having started, especially when the site is unattended and there is little passing traffic, means that a fire if ignited, e.g. arson, would have adequate time to spread within the tank storage areas unless there are security cameras available. Hence the need for cladding walls and separate bunding for the chemicals with characteristics of flammability and combustibility.

The Stage IV facility will need several security cameras. The IT system needs to be able to transmit the pictures to mobile phones or to a security contractor.

- Meteorological effects

The external fire risk would be subjected to meteorological effects during seasonal hot weather, however given the insulation properties of the steel and the storage areas being roofed, this would not be of concern.

- Operator errors in first response

The operators will have very short periods of time as a liquid fire spreads rapidly and is discussed in Section 4 of this report.

The above analysis flows into the hazard identification.

The hazard analysis and quantified risk assessment approach developed and recommended by the Department of Planning and Environment relies on a systematic and analytical approach to the identification and analysis of hazards and the quantification of off-site risks to assess risk tolerability and land use safety implications. The Department of Planning and Environment has advocated a merit-based approach, the level and extent of analysis must be appropriate to the hazards present and therefore, need only progress to the extent necessary for the particular case.

Benbow Environmental prefers to apply engineering solutions to prevent hazards generating off site impacts and therefore reduce the level of risk to negligible levels. This avoids reliance on justifying quantifiable risks are less than criteria although the event could still occur.

Additional safeguards are added to the design of the facility to reduce the risk of a hazard occurring. These are detailed in the recommendations.

3.1 METHODOLOGY

The procedures adopted by this study for assessing hazardous impacts involve the following steps:



- Step 1: Hazard identification;
- Step 2: Hazard analysis (consequence and probability estimations); and
- Step 3: Risk evaluation and assessment against specific criteria.

The following sections of the report discuss the hazard identification and analysis process as prescribed by the Department of Planning in its document entitled *Hazardous Industry Planning Advisory Paper No 6 – Guidelines for Hazard Analysis* (DoP 2011).

3.2 HAZARD IDENTIFICATION

This is the first step in the risk assessment. It involves the identification of all theoretically possible hazardous events as the basis for further quantification and analysis. This does not in any way imply that the hazard identified or its theoretically possible impact will occur in practice. Essentially, it identifies the particular characteristics and nature of hazards to be further evaluated in order to quantify potential risks.

To identify hazards, a survey of operations was carried out to isolate the events which are outside normal operating conditions and which have the potential to impact outside the boundaries of the Site. In accordance with HIPAP 6, these events do not include occurrences that are a normal part of the operation cycles of the Site but rather the atypical and abnormal, such as the occurrence of a significant liquid spill during product transfer operations.

3.3 HAZARD ANALYSIS

After a review of the events identified in the hazard identification stage and the prevention/protection measures incorporated into the design of the Site, any events which are considered to have the potential to result in impacts off-site or which have the potential to escalate to larger incidents are carried to the next stage of analysis.

3.3.1 Consequence Estimation

This aspect involves the analysis and modelling of the credible events carried forward from the hazard identification process in order to quantify their impacts outside the boundaries of the Site. In this case these events typically include fire and the potential effects on people and/or damage to property.

3.3.2 Probability Likelihood Estimation

If necessary, the likelihood of incidents are quantified by adopting probability and likelihood factors derived from published data.

3.3.3 Risk Evaluation and Assessment

The risk analysis includes the consequences of each hazardous event and the frequencies of each initiating failure. The results of consequence calculations together with the probabilities and likelihood's estimated are then compared against the accepted criteria, as specified by Department of Planning risk criteria applicable for the site. Whether it is considered necessary to conduct the predictions would depend on the probabilities and likelihoods estimated and if the risk criteria are exceeded.

Risk: Defined in terms of consequences and likelihood (probability) of an incident occurring.

Individual risk of fatality: Probability i.e. chance/likelihood of this occurring per year

Societal risk: Relation between number of people killed in a single incident and the chance or likelihood this number will be exceeded.

3.4 ASSESSMENT CRITERIA

The risk criteria applied by Department of Planning is published in their document *Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Safety Planning* (DoP 2011). The following is a general discussion of the criteria that is used to assess the risk of a development on the surrounding community and environment.

3.4.1 Individual Fatality Risk Levels

The following paragraphs are reproduced from HIPAP No. 4 relating to individual fatality risk levels:

“People in hospitals, children at school or old-aged people are more vulnerable to hazards and less able to take evasive action, if need be, relative to the average residential population. A lower risk than the one in a million criteria (applicable for residential areas) may be more appropriate for such cases. On the other hand, land uses such as commercial and open space do not involve continuous occupancy by the same people.

The individual’s occupancy of these areas is on an intermittent basis and the people present are generally mobile. As such, a higher level of risk (relative to the permanent housing occupancy exposure) may be tolerated. A higher level of risk still is generally considered acceptable in industrial areas” (DoP 2011).

The risk assessment criteria for individual fatality risk are presented below.

Table 3-1: Individual Fatality Risk Criteria

Land Use	Risk Criteria x 10 ⁻⁶
Hospitals, schools, etc.	0.5
Residential	1
Commercial	5
Sporting and active open space	10
Industrial	50

3.4.2 Injury Risk Levels

Injury risk levels from HIPAP No. 4 are stated below for heat of radiation.

- Incident heat flux radiation at residential areas should not exceed 4.7 kW/m², at frequencies of more than 50 chances in a million per year.

- Incident explosion overpressure at residential areas should not exceed 7 kPa, at frequencies of more than 50 chances in a million per year.

The requirements for toxic exposure are stated as follows:

- Toxic concentrations in residential areas should not exceed a level that would be seriously injurious to sensitive members of the community following a relatively short period of exposure at maximum frequency of 10 in a million per year.
- Toxic concentrations in residential areas should not cause irritation to the eyes or throat, coughing or other acute physiological responses in sensitive members of the community over a maximum frequency of 50 in a million per year.

Please note that a risk hazard assessment only examines events that are considered to have the potential for significant off-site consequences.

3.4.3 Risk of Property Damage and Accident Propagation

HIPAP No. 4 indicates that siting of a hazardous installation must account for the potential for propagation of an accident causing a “domino” effect on adjoining premises. This risk would be expected within an industrial estate where siting of hazardous materials on one Site may potentially cause hazardous materials on an adjoining premises to further develop the size of the accident.

The criteria for risk to damage to property and of accident propagation are stated as follows:

- Incident heat flux at neighbouring potentially hazardous installations or at land zones to accommodate such installations should not exceed a risk of 50 in a million per year for the 23 kW/m² heat flux level.
- Incident explosion overpressure at neighbouring potentially hazardous installations, at land zoned to accommodate such installations or at nearest public buildings should not exceed a risk of 50 in a million per year for the 14 kPa explosion overpressure level.

3.4.3.1 Heat-Flux Radiation Criteria

Table 3-2: Consequences of Heat Radiation

Heat Radiation (kW/m ²)	Effect
1.2	Received from the sun at noon in summer
2.1	Minimum to cause pain after 1 minute
4.7	Will cause pain in 15–20 seconds and injury after 30 seconds' exposure (at least second degree burns will occur)
12.6	- Significant chance of fatality for extended exposure. High chance of injury. - Causes the temperature of wood to rise to a point where it can be ignited by a naked flame after long exposure. - Thin steel with insulation on the side away from the fire may reach a thermal stress level high enough to cause structural failure.
23	- Likely fatality for extended exposure and chance of fatality for instantaneous exposure. - Spontaneous ignition of wood after long exposure. - Unprotected steel will reach thermal stress temperatures which can cause failure. - Pressure vessel needs to be relieved or failure would occur.
35	- Cellulosic material will pilot ignite within one minute's exposure. - Significant chance of fatality for people exposed instantaneously.

3.4.3.2 Explosion Over-Pressure Criteria

Table 3-3: Consequences of Explosion Overpressure

Explosion Overpressure	Effect
3.5 kPa (0.5 psi)	90% glass breakage. - No fatality and very low probability of injury.
7 kPa (1 psi)	- Damage to internal partitions and joinery but can be repaired. - Probability of injury is 10%. No fatality.
14 kPa (2 psi)	House uninhabitable and badly cracked.
21 kPa (3 psi)	- Reinforced structures distort. - Storage tanks fail. 20% chance of fatality to a person in a building.
35 kPa (5 psi)	- House uninhabitable. - Wagons and plant items overturned. - Threshold of eardrum damage. 50% chance of fatality for a person in a building and 15% chance of fatality for a person in the open.
70 kPa (10 psi)	- Threshold of lung damage. 100% chance of fatality for a person in a building or in the open. - Complete demolition of houses.

3.5 LESSONS LEARNT

Documentation of incidences of fires is summarised as it provides lessons learnt from experiences involving fires. First discussed is Warehouses for general interested and then specifically fires involving Class IIIB combustible liquids from NFPA is of direct relevance.

3.5.1 Warehouse Activities

A study of accidents that occurred over a five year period revealed the causes of accidents or events that led to fires in warehouses in developed countries that included the USA, UK, Australia, China and Germany. The analysis of fire is shown in the table below, however these firstly discuss warehouses used for packaged goods, not bulk.

The percentage figures of Table 3-4 are useful in assessing the relative importance of each cause of fire and stored material during this period.

Table 3-4: Fire causes for warehouses storing flammable liquids from 2000-2005

Stored Material	No. of fires due to different causes					Total	% Distribution
	Spillage	Electrical Fault	Safety Issues	Accident	Unknown		
Paint	1	1			1	3	13%
Diesel Fuel				1	3	4	17%
Fuel Oil			1		2	3	13%
Methanol		1		1		2	9%
Solvent		1			1	2	9%
Petroleum Products	1				1	2	9%
Oil					4	4	17%
Petrochemical				1	2	3	13%
Total	2	3	1	3	14	23	100%
% Distribution	9%	13%	4%	13%	61%	100%	

According to Table 3-4, diesel fuel and oil were the most involved materials in fires during the 5 year period analysed. The greatest number of fires occurred due to the storage of diesel fuel (17%) and oil (17%). The next greatest materials involved with fires were paint (13%) and petrochemical products (13%).

Since the cause of a fire cannot always be determined with certainty, most of the causes were not able to be reported (61%). Table 3-4 shows that the leading two detectable causes of fire were electrical fault and accident, an example of an accident could be impact of mobile equipment with a drum of product. Spillage contributed to 9% of fires and is one of the principal risks found from practical observations in warehouses. Figure 3-1 and Figure 3-2 present the graphical analysis of this study.

Figure 3-1 and Figure 3-2 illustrate the percentage of fire for different material and different causes.

Figure 3-1: Fire percentage for different material

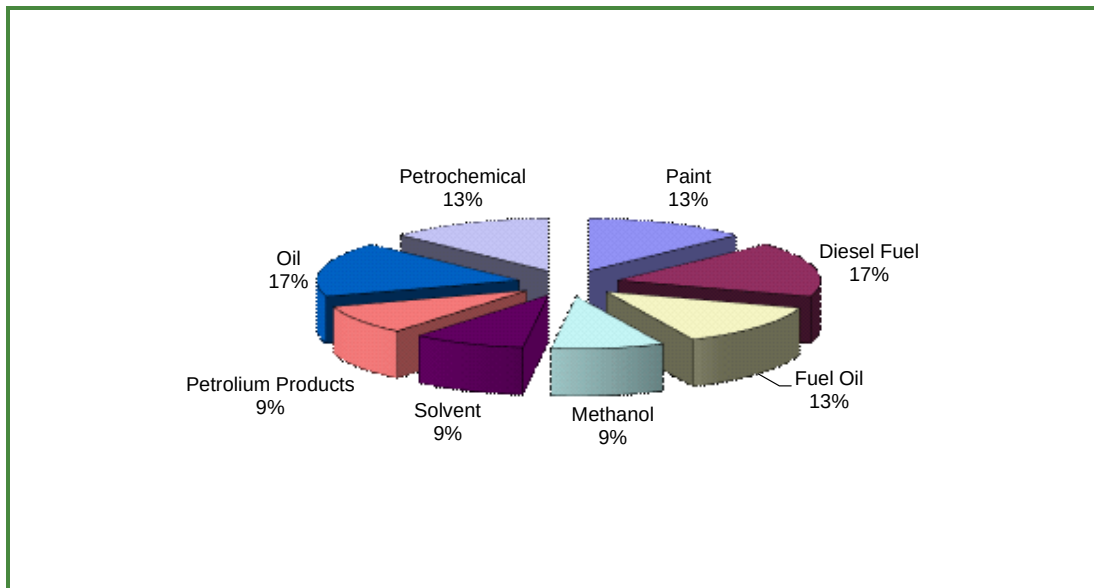
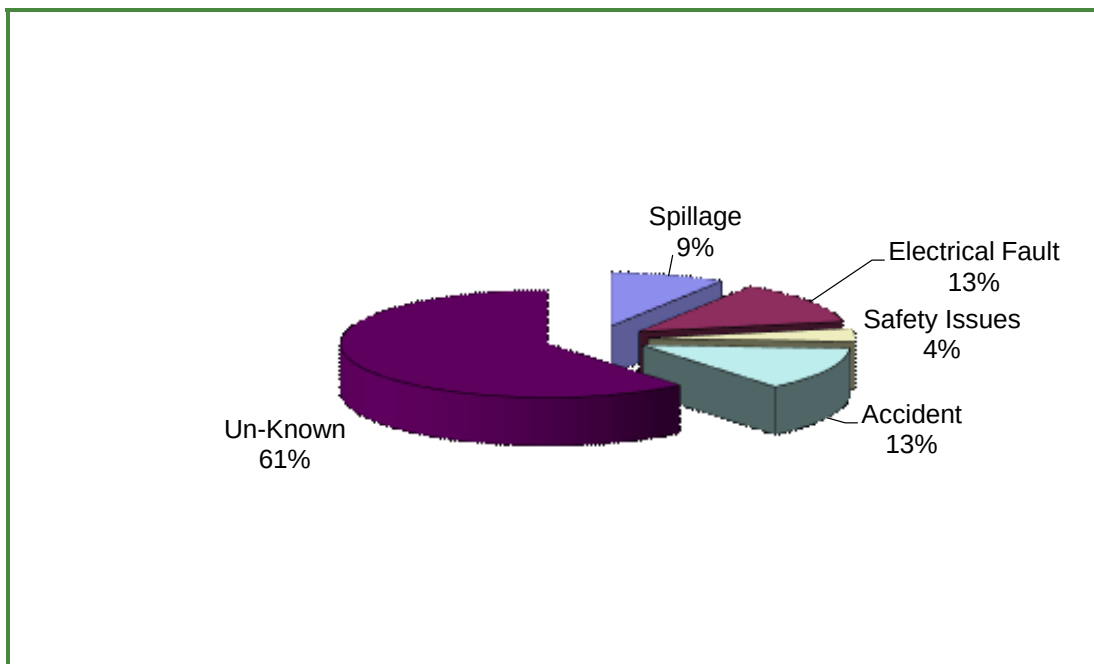


Figure 3-2: Fire Percentage due to different causes



Within industrial settings there are numerous potential sources of ignition with sufficient heat to cause ignition of flammable products. Examples of ignition sources include naked flames, exposed incandescent material, electrical welding arcs, mechanical or static sparks, and electrical, electronic or mechanical equipment not suitable for use in hazardous locations.

Examples of ignition sources and potential issues in their control include:

- Flames;
- Direct fired space and process heating;
- Use of cigarettes/matches;
- Cutting and welding flames;
- Hot surfaces;
- Space heating equipment;
- Mechanical machinery;
- Electrical equipment and lights ;
- Vehicles, unless specially designed or modified are likely to contain a range of potential ignition sources;
- Hot work;
- Filaments from lighting;
- Failure of training in hazardous areas, risks associated with flammable liquids;
- Failure of operator procedures to provide adequate instruction;
- “Emu” policy is endemic in an organisation and management are unwilling to face realities of the weaknesses that exist;
- Spontaneous heating;
- Friction heating or sparks;
- Impact sparks;
- Sparks from electrical equipment;
- Stray currents from electrical equipment;
- Electrostatic discharge sparks;
- Lightning strikes;
- Electromagnetic radiation of different wavelengths;
- Static electricity discharges from clothing, transfer of fuels, polythene wrapping (shrink wrapping);
- Forklift trucks;
- Inadequate ventilation control of spillages
- Failure of induction systems to acquaint contractors with the risks that exist on site; and
- Operator enthusiasm for management procedures begins to wain and needs regular reinforcement.

The following precautions should be observed for any storage facility of Class 3 flammable liquids and combustible liquids.

The following minimum safe working procedures need to be followed:

- Flammable and combustible liquids must be stored away from ignition sources (e.g. flames, electrical equipment, grinding and cutting operations) and excessively hot locations;
- All containers must be kept closed when not in use (including containers for waste liquids);
- Any action to open or decant from a container of flammable liquid must be carried out in a well ventilated area and sufficiently distant from any potential ignition source so as to ensure safety having due regard to the quantity being handled;
- Combustible wastes or residues must not be kept or left in areas where flammable or combustible liquids are stored or decanted;
- Materials that might interact dangerously with flammable and combustible liquids must be store separately from them. In particular oxidising agents must be stored separately;
- All people handling flammable and combustible liquids must be familiar with their hazardous properties and the necessary safety procedures for handling them;
- Any spillage must be cleaned up immediately;
- Flammable and combustible liquids must not be stored or used where they may jeopardise escape from a room or building in the event of a fire;

- Where the quantities of combustible liquids stored is greater than minor quantities, a warning sign must be displayed (as illustrated below) at the entrances to the warehouse; and



- Once the quantity of liquids exceeds 600,000 L, hose reels need to have a supply of foam available along with a means of injecting the foam into the water flow. This provides an effective first level of response until the fire brigade attend to the fire. The analysis of scenarios involving fire at the Stage IV Facility would lead to a set of fire protection measures.

3.5.2 Fires Involving Tank Farms

Tank farms involving flammable and combustible liquids that are stored within or near buildings present high levels of fire risk due to the quantity of fuel available for a fire.

A study of the ignition of fires within tank storage areas has shown the following:

- The majority of fires involve flammable liquids where an explosive atmosphere was present and an ignition source ignited the air-gas mixture causing a fire and often an explosion.
- The majority of fires involving combustible liquids on their own are due to ignition sources such as:
 - ▶ Sparks from electrical tools and equipment;
 - ▶ Combustible liquid stains being impacted by a spark from welding or cutting;
 - ▶ A spill making direct contact with an electrical piece of equipment that has inadequate IP protection or should be located away from spill pathways;
 - ▶ Cigarette smoking;
 - ▶ Open flames from oxy-acetylene;
 - ▶ Use of QA test equipment that boils the waste oil or determines presence of contaminants;
 - ▶ Fire occurring in a truck delivering or receiving waste oil; and
 - ▶ Fire occurring off-site and embers enter the roof ventilation.

There are clear indications that the majority of these can be avoided using the following hierarchy of controls:

- Maintain the surfaces of the tanks, pumping equipment and the bunded areas free of oil stains and build-up of oil;
- Induction system for contractors;
- Housekeeping inspections;
- Hot work permit system;
- Emergency plan in place; and
- Trained first response fire crew.



The flashpoint of certain of the liquids is moderate and a strong direct source of heat would be needed to cause vapour to be released that could be ignited.

The following is a useful checklist for the storage facility based on practical experience overseas in regard to liquid storage tanks inside buildings:

- **Construction:**
Tank construction is of vital importance. It needs to be of welded steel. It requires correctly sized venting to prevent excess pressure causing cracks especially at stress concentration points.

It requires a solid base.

It needs to be able to be isolated with other tanks to limit the spread of leakages; to be able to contain a tank failure; and to limit the spread of a pool fire.
- **Occupancy:**
The building occupancy is limited to plant personnel.

Offices are isolated by fire rated walls.

An emergency Plan is in place, is effective and is used.
- **Fire protection equipment:**
The fire protection equipment provides the means for a trained first response fire crew to be well-equipped and effective. Therefore there are three levels of reaction to a fire:
 - (1) Low level first response which is based on extinguishers and foam connected to fire hoses;
 - (2) Medium to high level first response based on hydrants within the building permanently connected to foam applicators;
 - External hydrants
 - Supply of 205 L of foam
 - Trained first response crew
 - Sprinkler system for tank cooling.
 - (3) Life Hazard
 - Offices isolated by FRL walls
 - Emergency plan is in place, is effective and is used.
- **Water supply:**
Fire engineers would ascertain the Mains supply, whether on-site tanks and fire pumps are required.
- **Street conditions:**
Considered to be highly advantageous as the site is accessible from two street frontages and Fire and Rescue NSW brigade is minutes away



- Area:
Tanks are separated by intermediary bunding. Tank farm is bunded. Building is bunded.

Cooling water sprinklers added if justifiable.

Site has kerbing and stormwater isolation.

The site as proposed has been designed with emphasis on firstly preventing a fire and then having the means available to achieve the following:

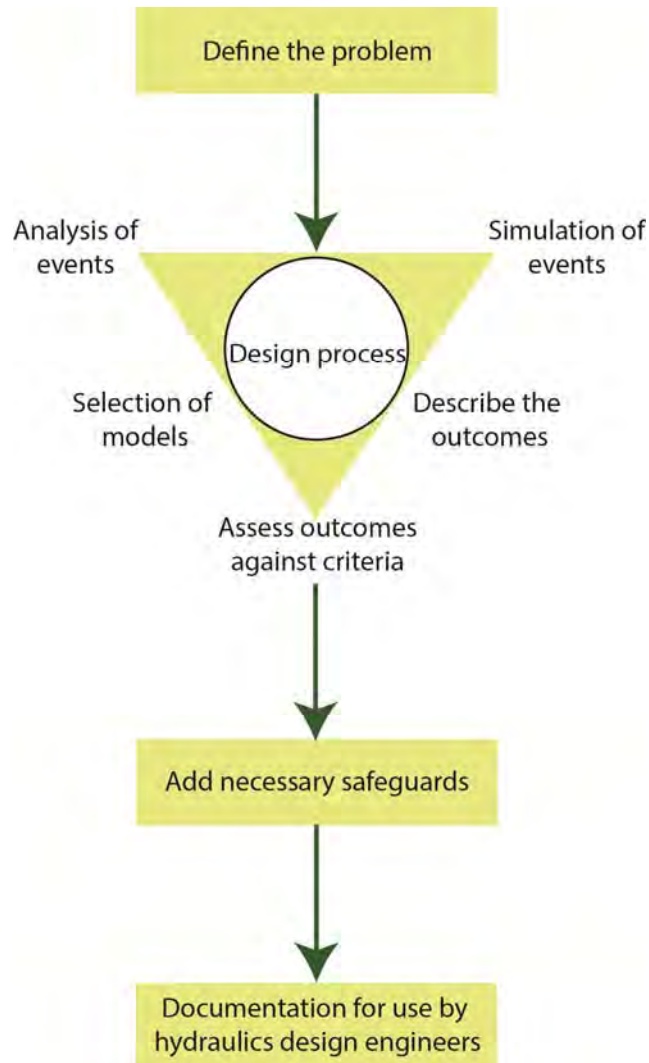
- Minimal to negligible life safety risk;
- Minimal risk of damage to the building;
- No off-site impacts by a potential fire; and
- Containment of fire fighting water using the triple bunding approach of:
 - ▶ Tank farm bunding;
 - ▶ Building bunding; and
 - ▶ Site bunding.

3.6 BUILDING SEPARATION DISTANCES

The building distances will comply with AS 1940–2017.

4. HAZARD IDENTIFICATION AND ASSESSMENT OF THE FIRE THREAT

This section of the report analyses the hazard and applies an engineering design framework based on the following methodology:



The report through to the final documentation section will detail the recommended safeguards.

Within the design process the methodology is described below.



4.1 HAZARD IDENTIFICATION CHARTS

In order to identify and characterise the nature of potential fire events, a series of Hazard Identification Charts have been compiled. The compiled charts are provided overleaf. The charts, for the purpose of this study only assess potential fire events. Each chart consists of four columns:

Column 1: *Functional/Operational Area*

The processes of the Site involved with the potential event is listed eg. Flammable Liquid Store.

Column 2: *Possible Initiating Event*

The events that are considered to be likely or realistic are listed. Where the possible consequences are similar, the events are listed together and individually numbered.

Column 3: *Possible Consequences*

The outcomes from an event occurring are listed eg. Fire, Explosion

Column 4: *Prevention/Protection Measures*

The measures designed into the function/operation of the particular area of the Site are listed. The measures include, for example, safeguards, design features, management methods and operator training.

Table 4-1: Event/Consequence Analysis Table

Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
1. Warehouse “B1” or “B2”	- Spill of quantity of solvent or hydrocarbon from a 205L drum or IBC. - Quantity of spill could vary from being minor e.g. 5–20L, moderate 20L–50L, or major >100L. - Spill causes fire if vapour comes into contact with an ignition source. - Full scale flammable liquids store fire.	- Spill occurs during unloading and outside the flammable liquids store. Spill is immediately detected and cleaned up without an incident. - Spill escapes to stormwater; stormwater isolation put into effect following the site’s spill control procedure. - Spilt liquid is ignited resulting in fire and/or explosion. - Fire engulfs transport truck. - Spill occurs within flammable liquid store. Spill is immediately detected and cleaned up without an incident. - No ignition of the flammable vapour occurs as flammable liquid store is a hazardous zoned area.	- Procedures, facilities and absorbent materials for spillage control are maintained on site. - All employees are trained and experienced in the spill control procedures. - These employees are in regular attendance and spill control can be immediately implemented. - Hose reels near and inside the flammable liquids store are provided with foam so that spill area can be covered with foam to suppress evaporation of liquid. - Site stormwater system able to be isolated. - If the event occurred within the flammable liquid store, this store is separated from on-site protected areas and off-site protected places in accordance with distances in AS 1940–2017 and has 240/240/240 walls and 180/180/180 roof. - Product packaging for deliveries comply with the specifications of the ADG Code. - Forklift truck drivers are specifically trained in the handling of dangerous goods. - The chemical storage area is considered to be a Zone II hazardous area. A forklift designed for use in a hazardous area would be used.



Table 4-1: Event/Consequence Analysis Table

Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
2. Warehouse “B1” or “B2”	Drum or IBC leaks while stored.	- Leak goes unnoticed and finds a source of ignition resulting in a pool or running fire in the store. - Fire spreads to involve all stored material. Pool fire can develop to involve whole bund. - Radiation from pool fire causes heating of adjacent drum store causing spread of fire. - Fire spreads to general office building.	- Roofed drum store is bunded. - Roofed drum store is equipped with electrical equipment as per hazardous zoning requirements. - Roofed drum store is ventilated. - Procedures and facilities for spillage control are maintained on-site. - Hot work permit system operates on-site. - Smoking is not permitted on the site in exception to the designated lunch area in the administration area. - Store is separated from general office and other dangerous goods by adequate separation distances in accordance with AS 1940–2017 and AS/NZS 3833:2007. - Trained emergency response/fire team is on stand-by during working hours to provide first response to emergencies. - Forklift rated for hazardous areas used in the chemical storage area.

Table 4-1: Event/Consequence Analysis Table

Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
3. External area	• Drum or IBC of flammable liquid falls off pallet while being handled by a forklift truck and leaks/bursts. • Drum or IBC of flammable liquid pierced by forklift tyre while being handled.	• Spill finds a source of ignition resulting in a pool or running fire in the yard. • Spill enters stormwater system. • Evaporation of spilt solvent occurs resulting in gaseous emissions.	• Drums and IBCs comply with and are selected in accordance with ADGC requirements. • Operators are present during all these handling activities. • Area is out doors and well ventilated. • Appropriate fire fighting equipment is available for use across the site. • Hot work permit system operates on-site. • Procedures and facilities for spillage control are maintained on-site – hydrocarbon spill kit. • Absorbent material is kept near unloading area. • Trained emergency response/fire team is on stand-by during working hours to provide first response to emergencies. An emergency plan exists.
4. Unloading Areas	• Leak during goods movement.	• Spillage contained in bunded site. • Spill enters stormwater drain(s). • Vapour from bund contents finds a source of ignition and a pool fire develops in the bund. • Radiation from pool fire causes heating of adjacent areas, thus spreading the fire. • Toxic vapours / clouds are formed due to evaporating pool or pool fire.	• The site would be protected via hose reels, hydrants and fire extinguishers and are installed and maintained in accordance with the relevant Australian Standards. • Spill kits are readily available for treatment of spills • Site induction is established on site for employees and visitors, which would address matters on safety, hazards, and procedures to adhere with on site. • Appropriate emergency procedures are available for the site and all staff will be trained in the appropriate emergency procedures • The unloading area has sufficient separation distances from existing nearby properties and structures to prevent the spread of fire. • Transfer operations would be supervised at all times.

Table 4-1: Event/Consequence Analysis Table

Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
5. Loading Out Areas	Packaging damage during product transfer.	- Spill of material. - Material escapes to stormwater. - Spilt material forms vapour. - Vapour impacts on employee's personal health and safety. - Material finds an ignition source resulting in a fire.	- All product transfer operations are supervised by experienced operators trained in safe operating procedures. - No materials are stored in bulk. - Spill control equipment is provided near the loading out area. Employees are in regular attendance to implement spill control procedures. - Strict control of ignition sources including a hot work permit system will operate. No smoking will be permitted in the loading dock area. - Fire services are located near the loading out area. - Emergency evacuation plan and emergency response plan involve adjoining warehouse occupants are implemented.
6. Tanker unloading or loading	- Failure of a pump bearing causes excess heat. - Failure of an electrical motor causes a fire. - Failure of a pipe/hose fitting releases a mist which is ignited by a hot surface.	- Fire at the road tanker, substantial fuel available. Heat exposes tanks to sufficient heat to cause tank rupture. Pool fire spreads - Fire within the bunded tanks' area. Pool fire spreads within the bunded area, tank ruptures, contents continue to fuel confined pool fire.	- Operators always present during the tanker unloading/loading process. - Preventative maintenance programme. - First response fire services available. - Operators trained in use of these services. - Tanker unloading area has drive over ramps that confine the pool fire. - Fire services provide immediate access to foam to rapidly dimension intensity of fire. - Fire in a tank storage area is confined with limited immediate opportunity to damage the building due to the presence of fire rated walls. - Site has stormwater/fire fighting water isolation. - Emergency plan in place.

Table 4-1: Event/Consequence Analysis Table

Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
	Leakages collect at the tanker unloading/loading area and splash onto the hot exhaust of the truck engine.	Fire with sufficient fuel available to cause rapid spread of fire to the tanker and subsequent heat of radiation causes fire in tank storage area.	- Preventative maintenance programme. - Routine cleaning of tanker area. - Leakages promptly attended to. - Site always occupied when trucks are on site. - Tanker parking area is bunded to prevent spread of a pool fire. - Foam available with hose reels or at a hydrant foam dispensing unit to provide an immediate first response. - Emergency plan in place.
7. Tank storage area fire	Hot work ignites liquid spilt in bund or ignites surface of liquid in a tank.	Tank storage area engulfed.	- Hotwork permit system in place. - Operators have access to first response fire services. - Tanks are separated into sets rather than one large tank farm to reduce potential for a large pool fire. - Emergency Plan in place.
	Fire from other sites causes release of tinders	Tinders make contact with surface of a tank and cause ignition.	- Operators have access to first response fire services. - Tanks kept free of stains. - Bunds kept free of leakages.
	Fire in adjacent premises impinges on building	Tanks heated to above flash point and ignite.	- Operators have access to first response fire services. - Several hydrants provided on site.
	Arsonists use accelerant to cause fire	Tank farm engulfed.	Building under security surveillance so presence of smoke would be detected.

Table 4-1: Event/Consequence Analysis Table

Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
	Tank overfilled and loss of containment due to bund leaking. Leaking liquid finds source of heat and ignites.	Pool fire on site.	- Tanks have level indication and alarms for high level. - Operators present during tanker unloading. - Bunding made from reinforced concrete. - Site infrastructure routinely inspected. - Emergency Plan in place. - Tank level indicators and fill point alarms checked every six months onto a preventative maintenance log. - Internal inspection of the integrity of the tanks to schedule advised in AS 1940. - Tank overfilling limited by the maximum quantity stored in a compartment of the road tanker ~5,000 L.
8. Explosion “within” a tank.	Tank exposed to high levels of heat of radiation. Liquid begins to boil and releases highly flammable vapour. Vapour ignites and causes boiling liquid to also ignite generating an explosion.	Tank explodes and causes structural damage to the bund wall and fire rated wall. Pool fire spreads outside of bunded area and flows towards the site stormwater isolation valve.	- Tanks are located in a bund with fire rated walls on three sides. Direction of flames impinging on the surface of a tank confined as to the direction that is available. Separation to external sources of heat are very effective in reducing heat of radiation on the surface of the tank. - Site has three hydrants with substantial water flow that can be used to apply cooling water to the tanks. - Site has a trained first response fire crew.
9. Fire within the offices or warehouse building	Tank exposed to high levels of heat of radiation leading to either the liquid boiling or a rupture of the tank.	A pool fire forms in the bunded area or away from the tank due to massive failure of the tank.	- Tank storage areas are designed with fire rated walls between the bunded area and the building providing a “two way” fire protection system. - Three double hydrants provided on site with high flow rates. - Trained first response fire crew on site.



Table 4-1: Event/Consequence Analysis Table

Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
10.Stage IV Facility staging area	• Drum or IBC overfilled. • Drum or IBC impacted by forklift tyres	• Leak goes unnoticed and finds a source of ignition, pool fire erupts and envelops the facility. • Radiation from pool fire causes excessive heat on the surface of the mixing tanks and larger fire erupts • Fire spreads across the facility.	• Areas are designed as a Zone II hazardous area. • Staging area permanently manned. • Hydrocarbon spill kits in this area. • Hose reels have foam so spill kits can be protected from ignition. • Procedures for spill control in place. • Operators are trained. • Majority of product in drums and IBCs has been diluted and is a low risk of ignition. • Area is protected by fire rated walls to limit spread of a fire.
11.Stage IV mixing area	• Failure of a disperser motor bearing causes excess heat. • Failure of a disperser motor causes a fire. • Failure of a pipe/hose fitting releases flammable vapour mist which is ignited by a hot surface.	• Fire within the mixing vessel. • Fire within the bund of the mixing vessel. • Fire outside the mixing vessel.	• Operators always present. • Area under CCTV viewing from the control room. • Preventative maintenance programme. • Separate bunding provided for mixing vessels and bulk tanks so that pool fire is confined. • Bulk storage tanks used for Class 8(3) chemicals are provided with cooling water in accordance with AS 1940. • Presence of fire rated walls. • Foam available with hose reels. • Operators trained in the use of fire extinguishers and foam.



Table 4-1: Event/Consequence Analysis Table

Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
12. Stage IV Facility	Human Errors	- High level ignored and a tank is overfilled. - Chemical added to an empty diluting/decanting tank and then water is added, generating steam and chemical splashes out of the tank. - Incompatible chemicals added to a bulk tank. - Spill occurs and is ignored. - Pumps and pipelines begin to leak and are ignored.	- Training through toolbox talks - Internal and external auditing. - Qualified operators. - Management auditing.

4.2 HAZARDS IDENTIFIED FOR FURTHER ANALYSIS

Following a review of the Hazard Identification Charts in Section 4.1, a series of potentially hazardous events or scenarios were considered to require a comprehensive qualitative analysis. Each event or scenario is discussed in detail and the need for further quantitative analysis considered.

The following hazards are identified for further analysis:

A large number of fire scenarios were analysed so that the sensitivity of the locations of the tanks could be assessed for off-site risk.

In undertaking the heat of radiation analysis recognised models are used.

The model package preferred by Benbow Environmental is discussed below and is recognised worldwide.

Simulations using similar algorithms as used in TNO have found similar predicted heat of radiation levels.

As combustible liquids are of a lesser risk, the database in the TNO package requires a suitable equivalent flammable liquid to be used. Xylene has similar combustion factors and has been used.

The hazardous scenarios identified for further analysis are described below:

B1 & B2 Area

Scenario 1	Fire involving 5,000 kg of flammable liquid ignited within the warehouse B1/B2 – contour provided.
Scenario 2	Fire involving 30,000 kg of flammable liquid ignited within the warehouse B1/B2 – contour provided.
Scenario 3	Fire involving 600,000 kg of flammable liquid ignited within the warehouse B1/B2 – contour provided.

Stage IV Facility

Scenario 4	Fire involving 100 kg of Class 8(3) flammable liquid at the Stage IV facility.
Scenario 5	Fire involving 3,000 kg of Class 8(3) flammable liquid at the Stage IV facility – contour provided.
Scenario 6	Fire involving 10,000 kg of Class 8(3) flammable liquid at the Stage IV facility – contour provided.
Scenario 7	Fire involving 30,000 kg of Class 8(3) flammable liquid at the Stage IV facility – contour provided.
Scenario 8	Fire involving 100 kg of acetic acid in a 2 m ² pool area – no contour provided
Scenario 9	Ground level concentrations from a fire involving 5,000 kg of acetic acid in a 30 m ² pool area – contour provided
Scenario 10	Ground level concentrations from a fire involving 30,000 kg of acetic acid in a 30 m ² pool area – contour provided.



Scenario 11	Ground level concentrations from a fire involving 5,000 kg of acetic acid in a 120 m ² pool area – contour provided.
Scenario 12	Ground level concentrations from a fire involving 30,000 kg of acetic acid in a 120 m ² pool area – contour provided.
Scenario 13	Ground level concentrations from a fire involving 100 kg of formic acid in a 2 m ² pool area.
Scenario 14	Ground level concentrations from a fire involving 5,000 kg of formic acid in a 30 m ² pool area.
Scenario 15	Ground level concentrations from a fire involving 30,000 kg of formic acid in a 30 m ² pool area.
Scenario 16	Ground level concentrations from a fire involving 5,000 kg of formic acid in a 120 m ² pool area.
Scenario 17	Ground level concentrations from a fire involving 30,000 kg of formic acid in a 120 m ² pool area.

Further detailed assessments of each of these areas have been provided in the following section.

4.3 CONSEQUENCE ANALYSIS – HEAT RADIATION

The heat radiation modelling was undertaken using both TNO Effects (Version 7.6) and modelling using the view factor where a fire rated wall was present. TNO Effects is a modelling software developed by TNO Built Environment and Geoscience, situated in the Netherlands. The software is able to predict both physical effects and consequences of a specific incident from the proposed development.

TNO Effects was used to obtain heat radiation contours based on combustion rates of the materials involved. The chemical data within the program is limited so xylene was used for the heat of radiation calculations at B1/B2. For the Stage IV facility, acetic and formic acids are included in the software. The radiation contours obtained from TNO Effects were mapped from the perimeter of the source area.

4.3.1 Scenario 1: Fire involving 5,000 kg of Class 3 flammable liquids at B1/B2

This scenario describes the event that a bund fire has occurred involving the combustion of 5,000 kg of flammable liquids within either warehouse.

The following calculations and assumptions were considered in the modelling of effects using TNO Effects:

- 5,000 kg of xylene was assumed to be involved in the fire;
- The pool fire surface area was the floor of either warehouse;
- A calculated combustion rate was used from TNO Effects;
- Ambient weather conditions at Minto; and
- Control measures in place consisting of fire-rated walls and the roof is collapsed.

The heat radiation distances obtained are presented in Table 4-2, Figure 4-1 and Figure 4-2 respectively.

Table 4-2: Heat Radiation Distances for Scenario 1

Level	Heat Radiation Distance from Fire Boundary (m)
4.7 kW/m ²	38.9
12.6 kW/m ²	17.7
23 kW/m ²	7.7
35 kW/m ²	1.5

Comment:

The heat of radiation levels are contained within the warehouse area.

Figure 4-1: Heat Radiation Contours for Scenario 1: Pool fire involving 5,000 kg of Class 3 flammable liquids in B1



Note: Isopleths illustrate the heat of radiation contours: Yellow = 4.7 kW/m^2 ; Orange = 12.6 kW/m^2 , Blue = 23 kW/m^2 , Red = 35 kW/m^2
The surface area remains constant for both 5 000 kg and 30 000 kg therefore the heat contours are identical.

Figure 4-2: Heat Radiation Contours for Scenario 1: Pool fire involving 5,000 kg of Class 3 flammable liquids in B2



Note: Isopleths illustrate the heat of radiation contours: Yellow = 4.7 kW/m^2 ; Orange = 12.6 kW/m^2 , Blue = 23 kW/m^2 , Red = 35 kW/m^2
The surface area remains constant for both 5 000 kg and 30 000 kg therefore the heat contours are identical.



4.3.2 Scenario 2: Fire involving 30,000 kg of Class 3 flammable liquids at B1/B2

This scenario describes the event that the previous pool fire (Scenario 1) has caused further IBCs to fail and a larger fire develops involving the combustion of the maximum storage amount of Class 3 PGIII flammable liquids (30,000 kg) within the chemical storage area. This scenario generates similar heat of radiation levels and contours as the burning rate is the same.

The following calculations and assumptions were considered in the modelling:

- 30,000 kg of xylene was assumed to be involved in the fire;
- The pool fire surface area was the floor of either warehouse;
- A calculated combustion rate from TNO Effects;
- Ambient weather conditions at Minto; and
- Control measures in place consisting of fire-rated walls, roof collapsed.

The heat radiation distances obtained are presented in Table 4-3, Figure 4-3 and Figure 4-4.

Table 4-3: Heat Radiation Distances for Scenario 2

Level	Heat Radiation Distance from Fire Boundary (m)
4.7 kW/m ²	38.9
12.6 kW/m ²	17.7
23 kW/m ²	7.7
35 kW/m ²	1.5

The heat of radiation levels are contained within the warehouse area.

Figure 4-3: Heat Radiation Contours for Scenario 2: Pool fire involving 30,000 kg of Class 3 flammable liquids in B1



Note: Isopleths illustrate the heat of radiation contours: Yellow = 4.7 kW/m^2 ; Orange = 12.6 kW/m^2 ; Blue = 23 kW/m^2 ; Red = 35 kW/m^2
The surface area remains constant for both 5 000 kg and 30 000 kg therefore the heat contours are identical.

Figure 4-4: Heat Radiation Contours for Scenario 2: Pool fire involving 30,000 kg of Class 3 flammable liquids in B2



Note: Isopleths illustrate the heat of radiation contours: Yellow = 4.7 kW/m²; Orange = 12.6 kW/m², Blue = 23 kW/m² Red = 35 kW/m²
The surface area remains constant for both 5 000 kg and 30 000 kg therefore the heat contours are identical.

4.3.3 Scenario 3: Fire involving 600,000 kg of Class 3 flammable liquids at B1/B2

This scenario assumes that the previous fire has not been able to be contained and the maximum storage amount that could be contained is involved.

This scenario describes the event that a large fire had occurred involving the combustion of the maximum storage amount of Class 3 PGIII flammable liquids within either warehouse.

The following calculations and assumptions were considered in the modelling of effects:

- 600,000 kg of xylene was assumed to be involved in the fire;
- The pool fire surface area was the floor of either warehouse;
- A calculated combustion rate was used from TNO Effects;
- Ambient weather conditions at Minto; and
- Control measures in place consisting of fire-rated walls, roof collapsed.

The heat radiation distances obtained are presented in Table 4-4 and Figure 4-5 respectively.

Table 4-4: Heat Radiation Distances for Scenario 3

Level	Heat Radiation Distance from Fire Boundary (m)
4.7 kW/m ²	50
12.6 kW/m ²	23.8
23 kW/m ²	11.4
35 kW/m ²	3.5

Comment:

The heat of radiation levels are contained within the warehouse area. Structural damage would not be expected to be extensive due to the presence of the 240/240/240 fire rated walls.

Figure 4-5: Heat Radiation Contours for Scenario 3: Bund fire involving 600,000 kg of Class 3 flammable liquids



Note: Isopleths illustrate the heat of radiation contours: Yellow = 4.7 kW/m^2 ; Orange = 12.6 kW/m^2 , Blue = 23 kW/m^2 Red = 35 kW/m^2

The following scenarios occur at the Stage IV facility.

4.3.4 Scenario 4: Fire involving 100 kg of Class 8(3) liquids

This scenario describes the event that a very small fire occurs within any area of the facility involving the combustion of 100 kg of Class 3 PGIII flammable liquids. It is likely the fire has erupted due to a small spillage of liquid.

The following calculations and assumptions were considered in the modelling of effects:

- 100 kg of xylene was assumed to be involved in the fire;
- The pool fire surface area was calculated to be 2 m² based on the spill occurring in a bunded area;
- A calculated combustion rate was used from TNO Effects;
- Ambient weather conditions at Minto; and
- No control measures in place such as fire-rated walls and fire-fighting equipment and devices.

The heat radiation distances obtained are presented in Table 4-5.

Table 4-5: Heat Radiation Distances for Scenario 4

Level	Heat Radiation Distance from Fire Boundary (m)
4.7 kW/m ²	5.0
12.6 kW/m ²	4.3
23 kW/m ²	4.3

Comment:

The heat of radiation levels would not reach the control office and there would be no structural damage.

4.3.5 Scenario 5: Fire involving 3,000 kg of Class 8(3) liquids

This scenario describes the event that a large fire had occurred involving the combustion of a larger amount of flammable liquids to show how far the heat of radiation contours would extend and cause damage to tanks and potentially cause the fire to spread.

The following calculations and assumptions were considered in the modelling of effects using TNO Effects:

- 3,000 kg of xylene was assumed to be involved in the fire;
- The pool fire surface area was estimated to be based on the area of the building;
- A calculated combustion rate was used from TNO Effects;
- Ambient weather conditions at Minto; and
- No control measures in place such as fire-rated walls and fire-fighting equipment and devices.

The heat radiation distances obtained are presented in Table 4-6 and Figure 4-6 respectively.

Table 4-6: Heat Radiation Distances for Scenario 5

Level	Heat Radiation Distance from Fire Boundary (m)
4.7 kW/m ²	66.7
12.6 kW/m ²	46.8
23 kW/m ²	36.5
35 kW/m ²	28.7

Comment:

The heat of radiation levels based on these assumptions could expose adjoining areas of the Stage IV facility to heat that would cause tanks to fail and the building structure to collapse.

Prevention of structural damage to adjoining properties would rely on fire fighting water directed by Fire Officers.

A recommendation is included that requires cooling water to be placed above the Class 8(3) tanks.

Figure 4-6: Heat Radiation Contours for Scenario 5: Fire involving 3,000 kg of Class 8(3) liquids



Note: Isopleths illustrate the heat of radiation contours: Yellow = 4.7 kW/m^2 ; Orange = 12.6 kW/m^2 , Blue = 23 kW/m^2 Red = 35 kW/m^2
The surface area remains constant for 3000 kg, 10000 kg and 30000 kg therefore the heat contours are identical.

4.3.6 Scenario 6: Fire involving 10,000 kg of Class 8(3) liquids

This scenario accepts that the fire has not been contained and has caused a bulk tank to fail or involved compartments of a road tanker.

The following calculations and assumptions were considered in the modelling of effects using TNO Effects:

- 10,000 kg of xylene was assumed to be involved in the fire;
- The pool fire surface area was estimated to be based on the area of the building;
- A calculated combustion rate was used from TNO Effects;
- Ambient weather conditions at Minto; and
- No control measures in place such as fire-rated walls and fire-fighting equipment and devices.

The heat radiation distances obtained are presented in Table 4-7 and Figure 4-7 respectively.

Table 4-7: Heat Radiation Distances for Scenario 6

Level	Heat Radiation Distance from Fire Boundary (m)
4.7 kW/m ²	66.7
12.6 kW/m ²	46.8
23 kW/m ²	36.5
35 kW/m ²	28.7

Comments:

The heat of radiation levels based on these assumptions could expose adjoining areas of the Stage IV facility to heat that would cause tanks to fail and the building structure to collapse.

Prevention of structural damage to adjoining properties would rely on fire fighting water directed by Fire Officers.

A recommendation is included that requires cooling water to be placed above the Class 8(3) tanks.

Figure 4-7: Heat Radiation Contours for Scenario 6: Fire involving 10,000 kg of Class 8(3) liquids



Note: Isopleths illustrate the heat of radiation contours: Yellow = 4.7 kW/m^2 ; Orange = 12.6 kW/m^2 , Blue = 23 kW/m^2 , Red = 35 kW/m^2 .
The surface area remains constant for 3000 kg, 10000 kg and 30000 kg therefore the heat contours are identical.

4.3.7 Scenario 7: Fire involving 30,000 kg of Class 8(3) liquid

This scenario assumes that the whole of a bulk storage tank or a road tanker is involved.

The following calculations and assumptions were considered in the modelling of effects using TNO Effects:

- 30,000 kg of xylene was assumed to be involved in the fire;
- The pool fire surface area was estimated to be based on the area of the building;
- A calculated combustion rate was used from TNO Effects;
- Ambient weather conditions at Minto; and
- No control measures in place such as fire-rated walls and fire-fighting equipment and devices.

The heat radiation distances obtained are presented in Table 4-8 and Figure 4-8 respectively.

Table 4-8: Heat Radiation Distances for Scenario 7

Level	Heat Radiation Distance from Fire Boundary (m)
4.7 kW/m ²	66.7
12.6 kW/m ²	46.8
23 kW/m ²	36.5
35 kW/m ²	28.7

Comment:

The heat of radiation levels based on these assumptions could expose adjoining areas of the Stage IV facility to heat that would cause tanks to fail and the building structure to collapse.

Prevention of structural damage to adjoining properties would rely on fire fighting water directed by Fire Officers.

A recommendation is included that requires cooling water to be placed above the Class 8(3) tanks.

Figure 4-8: Heat Radiation Distances for Scenario 7: Fire involving 30,000 kg of Class 8(3) liquid



Note: Isopleths illustrate the heat of radiation contours: Yellow = 4.7 kW/m^2 ; Orange = 12.6 kW/m^2 , Blue = 23 kW/m^2 , Red = 35 kW/m^2 .
The surface area remains constant for 3000 kg, 10000 kg and 30000 kg therefore the heat contours are identical.

4.4 CONSEQUENCE ANALYSIS – TOXIC COMBUSTION PRODUCT EMISSIONS

The new generation air dispersion model, AERMOD was used for the prediction of off-site impacts associated with the air emissions from the proposed operations. AERMOD uses air dispersion based on planetary boundary layer turbulence structure and scaling concepts. The AERMOD model replaced AUSPLUME as the air dispersion model accepted by the Victorian EPA in January 2014 and is accepted by the NSW EPA for air and odour assessments.

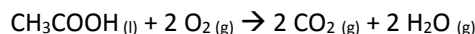
The nearest weather monitoring station within proximity to the subject site is the Campbelltown AWS operated by the Bureau of Meteorology. This monitoring station is located approximately 7.5 kilometres away to the south of the subject site and was considered to be the most appropriate due to the vicinity, completeness and latest data available to carry out dispersion modelling. Weather data for the year 2015 was obtained. For the purpose of inclusion in the air dispersion model a meteorological file using 2015 as the base year was generated by Air Quality Professionals Pty Ltd as a site-representative meteorological file for use in the assessment.

Flammable substances such as acetic acid and formic acid would consist of hydrocarbon, which would burn into carbon dioxide and water vapour in the event of complete combustion due to fire. Incomplete combustion would occur when the amount of oxygen in the air becomes insufficient compared to the hydrocarbon. When this occurs, smoke would be generated due to formation of toxic carbon monoxide.

4.4.1 Complete Combustion

Acetic Acid:

Complete combustion of acetic acid would follow the stoichiometric equation below:



For a complete combustion 2 moles of oxygen would be required per mole of acetic acid. To determine whether a fire event would likely to undergo complete combustion, the amount of oxygen available in the warehouse was determined below.

Assuming 10.455 m roof height at the peak (h_1) and 8.5 m to the top of the walls (h_2), and the area of the warehouse is 1253 m², the warehouse volume is:

$$V = Ah_1 + \frac{Ah_2}{3} = 11,467 \text{ m}^3$$

The volume of air would be approximately equal to warehouse volume. Assuming ideal gas under standard temperature and pressure

$$PV = nRT$$

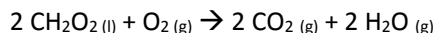
$$n = \frac{(101,325 \text{ Pa})(11,467 \text{ m}^3)}{(8.314)(298 \text{ K})} = 4.69 \times 10^5 \text{ moles}$$



Air consists of approximately 21% oxygen, therefore oxygen content in the warehouse would be 9.85×10^4 moles. This would be enough to completely react with 49,250 moles of acetic acid, equating to 2957 kg of spill.

Formic Acid:

Complete combustion of formic acid would follow the stoichiometric equation below:



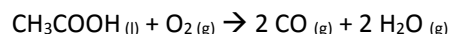
For a complete combustion 1 mole of oxygen would be required for every 2 moles of formic acid. To determine whether a fire event would likely to undergo complete combustion, the amount of oxygen available in the warehouse as calculated above was used.

9.85×10^4 moles of oxygen in the warehouse would be enough to completely react with 197,000 moles of acetic acid, equating to 9068 kg of spill.

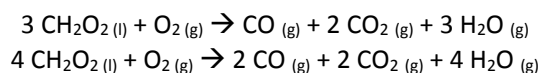
4.4.2 Incomplete Combustion

When the amount of oxygen becomes insufficient, other combustion products such as carbon monoxide, oxides of nitrogen, carbon (soot), and other hydrocarbon derivatives would be formed. Amongst all these products, toxic carbon monoxide smoke would likely be most selective according to various stoichiometric ratios. Examples of incomplete combustion would be:

Acetic acid:



Formic acid:



To account for the worst case scenario, the following ratios were considered applicable:

- For acetic acid, a ratio of 2 carbon monoxide formed per mole of acetic acid burnt.
- For formic acid, a ratio of 1:1 carbon monoxide formed per mole of formic acid was adopted. This is considered a worst case scenario as the number of moles of carbon monoxide produced gradually approaches but never quite reaches 1.

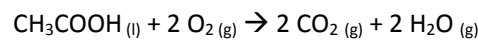
There would also be some extent of incomplete combustion from packaging materials such as cardboard, plastic and wood, which would contribute to smoke generation, however this has been considered much lower compared to that generated by burning flammables.

4.4.3 Scenario 8: Ground level concentrations from a fire involving 100 kg of Acetic Acid for a 2 m² pool area

This scenario describes the event that a small fire had occurred involving the combustion of 100 kg of acetic acid for a 2 m² area within the warehouse.

It was calculated that all of the 100 kg of acetic acid would undergo complete combustion in this scenario as there would be enough air within the warehouse to combust 2957 kg of acetic acid completely.

The combustion rate of acetic acid was found to be approximately 0.06 kg/s (TNO Effects) while the rate of combustion products formation was calculated according to the stoichiometric ratio below:



The average molecular weights of acetic acid and carbon dioxide are 60.05 g/mole and 44.01 g/mole respectively. This equates to the release of 36.6 kg of carbon dioxide. TNO effects estimated that the combustion of these products would take 26 minutes to complete. However, a minimum duration of 1 hour is required as the input into AERMOD, therefore an adjusted emission rate of 92.1 g/s of CO₂ was used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 1.41 m which is equal to the pool fire diameter;
- Temperature of 117.9°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s.

The next step involves estimation of ground level concentration and comparison to the ILDH and ERPG levels for carbon monoxide to determine potential consequences to the residential areas.

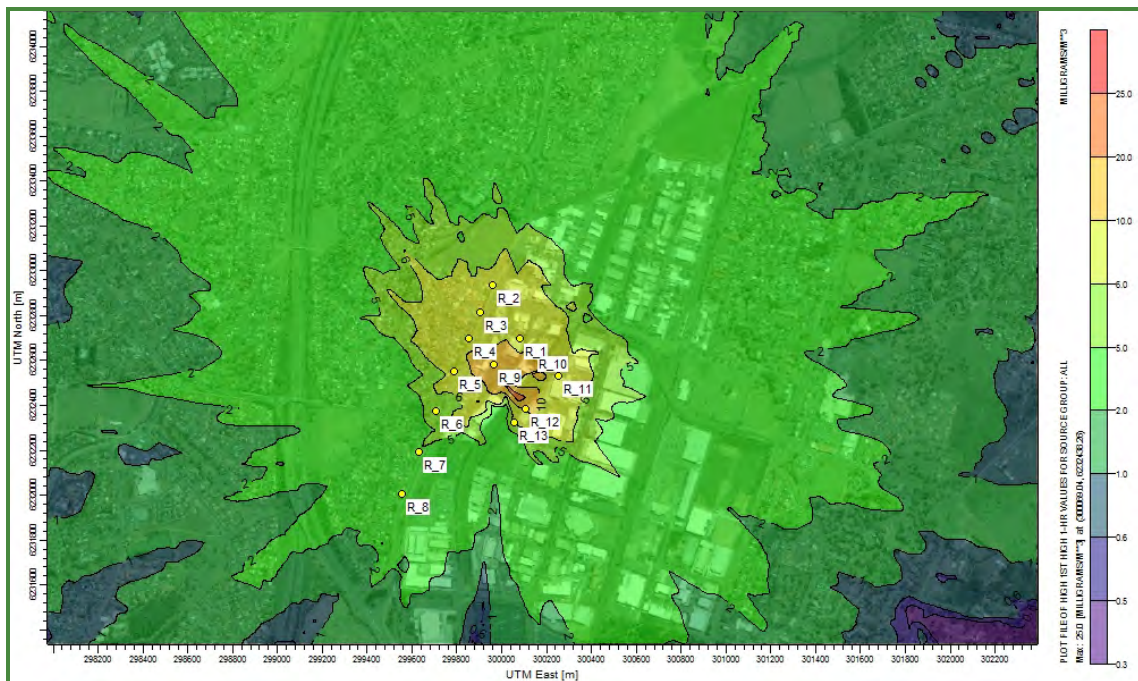
Table 4-9: Scenario 8: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 72,000 mg/m ³ exceeded
R1	9	No
R2	7	No
R3	8	No
R4	9	No
R5	8	No
R6	5	No
R7	5	No
R8	3	No
R9	14	No
R10	10	No
R11	8	No
R12	10	No
R13	5	No

Comment:

The IDLH limit was not exceeded at the identified sensitive receptors for this scenario.

Figure 4-9: Scenario 8: Ground Level Concentration of Carbon Dioxide Isoleth



Comment:

The IDLH limit was not exceeded at the identified sensitive receptors for this scenario.

4.4.4 Scenario 9: Ground level concentrations from a fire involving 5000 kg of Acetic acid for a 30 m² pool area

This scenario describes the event that a fire had occurred involving the combustion of 5000 kg of acetic acid for a 30 m² area within the warehouse.

It was calculated that there would only be enough oxygen to fully combust 2957 kg of acetic acid completely. As such incomplete combustion is expected to occur.

The combustion rate of acetic was found to be approximately 0.96 kg/s (TNO Effects). The average molecular weights of acetic acid and carbon monoxide are 60.05 g/mole and 28.01 g/mol respectively. This equates to the release of 1166.1 kg of carbon monoxide. TNO effects estimated that the combustion of these products would take 87 minutes to complete. An emission rate of 224.2 g/s for CO was used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

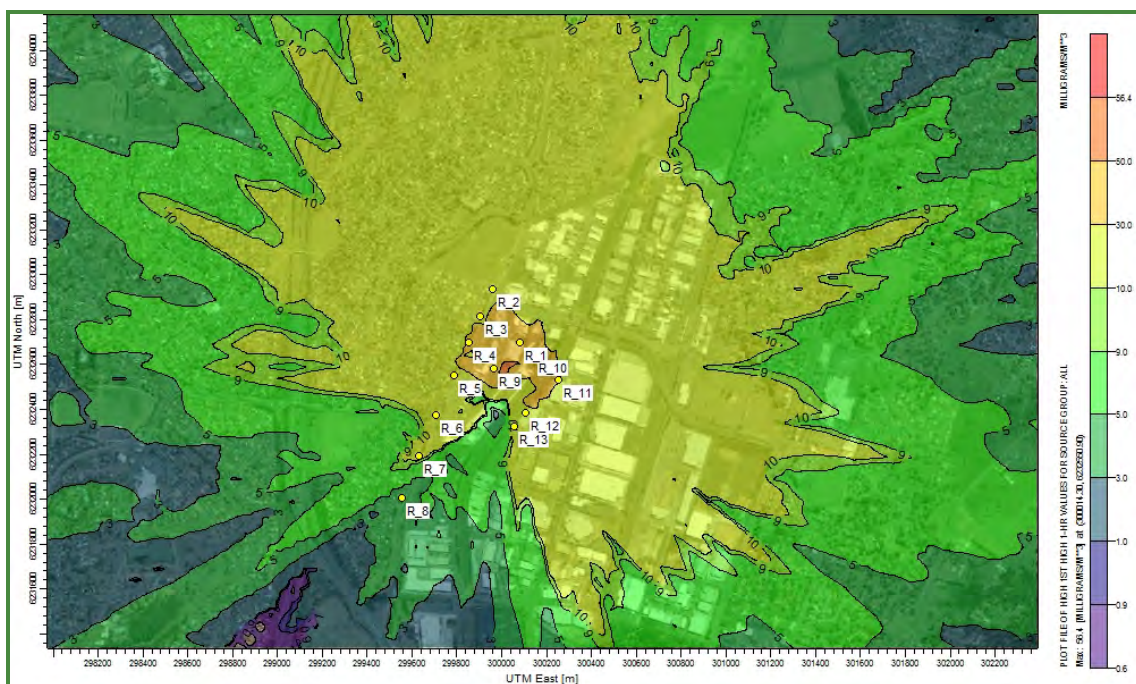
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 5.48 m which is equal to the pool fire diameter;
- Temperature of 117.9°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s.

The next step involves estimation of ground level concentration and comparison to the ILDH and ERPG levels to determine potential consequences to the residential areas.

Table 4-10: Scenario 9: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 1,374.7mg	ERPG – 1 229.1 mg/m ³ exceeded	ERPG-2 401.0mg/m ³ exceeded	ERPG-3 572.8mg/m ³ exceeded
R1	36	No	No	No	No
R2	28	No	No	No	No
R3	29	No	No	No	No
R4	31	No	No	No	No
R5	18	No	No	No	No
R6	10	No	No	No	No
R7	11.5	No	No	No	No
R8	4	No	No	No	No
R9	45	No	No	No	No
R10	38.5	No	No	No	No
R11	31	No	No	No	No
R12	18.5	No	No	No	No
R13	13	No	No	No	No

Figure 4-10: Scenario 9: Ground Level Concentration of Carbon Monoxide Isoleth



Comment:

The IDLH limit and ERPG 1-3 limits were not exceeded at the identified sensitive receptors for this scenario.

4.4.5 Scenario 10: Ground level concentration from a fire involving 30,000 kg of Acetic acid for a 30 m² pool area

This scenario describes the event that a small fire had occurred involving the combustion of 30,000 kg of acetic acid for a 30 m² area within the warehouse.

It was calculated that there would only be enough oxygen to fully combust 2957 kg of acetic acid completely. As such incomplete combustion is expected to occur.

The combustion rate of acetic was found to be approximately 0.96 kg/s (TNO Effects). The average molecular weights of acetic acid and carbon monoxide are 60.05 g/mole and 28.01 g/mol respectively. This equates to the release of 6996.7 kg of carbon monoxide. TNO effects estimated that the combustion of these products would take 520 minutes to complete. An emission rate of 224.2 g/s for CO was used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

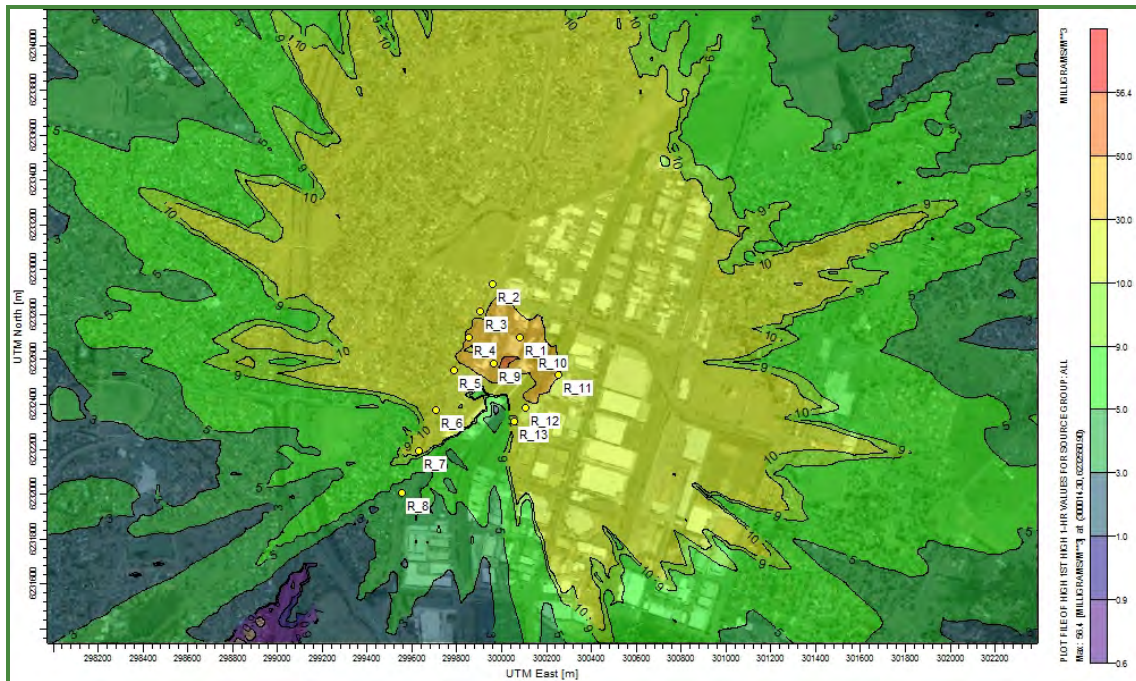
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 5.48 m which is equal to the pool fire diameter;
- Temperature of 117.9°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s

The next step involves estimation of ground level concentration and comparison to the ILDH and ERPG levels to determine potential consequences to the residential areas.

Table 4-11: Scenario 10: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 1,374.7mg	ERPG – 1 229.1 mg/m ³ exceeded	ERPG-2 401.0mg/m ³ exceeded	ERPG-3 572.8mg/m ³ exceeded
R1	36	No	No	No	No
R2	28	No	No	No	No
R3	29	No	No	No	No
R4	31	No	No	No	No
R5	18	No	No	No	No
R6	10	No	No	No	No
R7	11.5	No	No	No	No
R8	4	No	No	No	No
R9	45	No	No	No	No
R10	38.5	No	No	No	No
R11	31	No	No	No	No
R12	18.5	No	No	No	No
R13	13	No	No	No	No

Figure 4-11: Scenario 10: Ground Level Concentration of Carbon Monoxide Isopleth



Comment:

The IDLH limit and ERPG 1-3 limits were not exceeded at the identified sensitive receptors for this scenario.

4.4.6 Scenario 11: Ground level concentrations from a fire involving 5,000 kg of Acetic acid for a 120 m² pool area

This scenario describes the event that a fire had occurred involving the combustion of 5000 kg of acetic acid for a 120 m² area within the warehouse.

It was calculated that there would only be enough oxygen to fully combust 2957 kg of acetic acid completely. As such incomplete combustion is expected to occur.

The combustion rate of acetic acid was found to be approximately 3.84 kg/s (TNO Effects). The average molecular weights of acetic acid and carbon monoxide are 60.05 g/mole and 28.01 g/mol respectively. This equates to the release 1166.1 kg of carbon monoxide. TNO effects estimated that the combustion of these products would take 22 minutes to complete. However, a minimum duration of 1 hour is required as the input into AERMOD, therefore an adjusted emission rate of 1099.24 g/s of CO₂ was used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

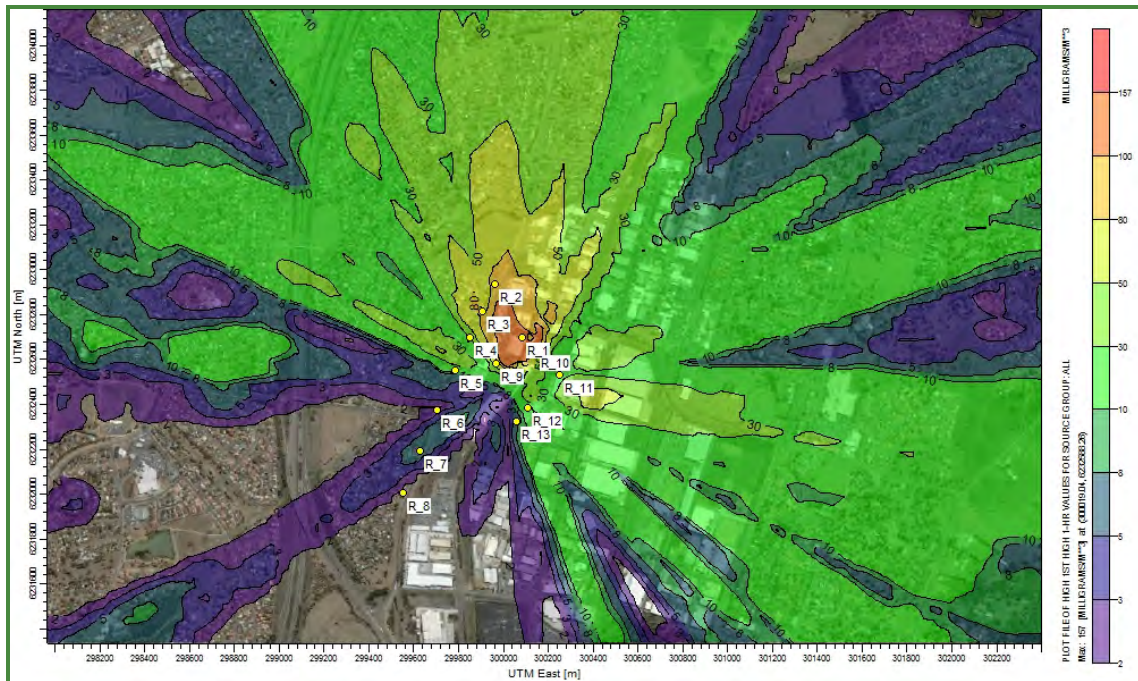
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 10.95 m which is equal to the pool fire diameter;
- Temperature of 117.9°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s

The next step involves estimation of ground level concentration and comparison to the ILDH and ERPG levels to determine potential consequences to the residential areas.

Table 4-12: Scenario 11: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 1,374.7mg	ERPG – 1 229.1 mg/m ³ exceeded	ERPG-2 401.0mg/m ³ exceeded	ERPG-3 572.8mg/m ³ exceeded
R1	115	No	No	No	No
R2	90	No	No	No	No
R3	90	No	No	No	No
R4	30	No	No	No	No
R5	11	No	No	No	No
R6	2	No	No	No	No
R7	6.5	No	No	No	No
R8	1	No	No	No	No
R9	54	No	No	No	No
R10	113	No	No	No	No
R11	21	No	No	No	No
R12	13	No	No	No	No
R13	7	No	No	No	No

Figure 4-12: Scenario 11: Ground Level Concentration of Carbon Monoxide Isopleth



Comment:

The IDLH limit and ERPG 1-3 limits were not exceeded at the identified sensitive receptors for this scenario.

4.4.7 Scenario 12: Ground level concentrations from a fire involving 30,000 kg of Acetic acid for a 120 m² pool area

This scenario describes the event that a small fire had occurred involving the combustion of 30,000 kg of acetic acid for a 120 m² area within the warehouse.

It was calculated that there would only be enough oxygen to fully combust 2957 kg of acetic acid completely. As such incomplete combustion is expected to occur.

The combustion rate of acetic acid was found to be approximately 3.84 kg/s (TNO Effects). The average molecular weights of acetic acid and carbon monoxide are 60.05 g/mole and 28.01 g/mol respectively. This equates to the release of 6996.7 kg of carbon monoxide. TNO effects estimated that the combustion of these products would take 130 minutes to complete. An emission rate of 896.7 kg/s and CO was used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

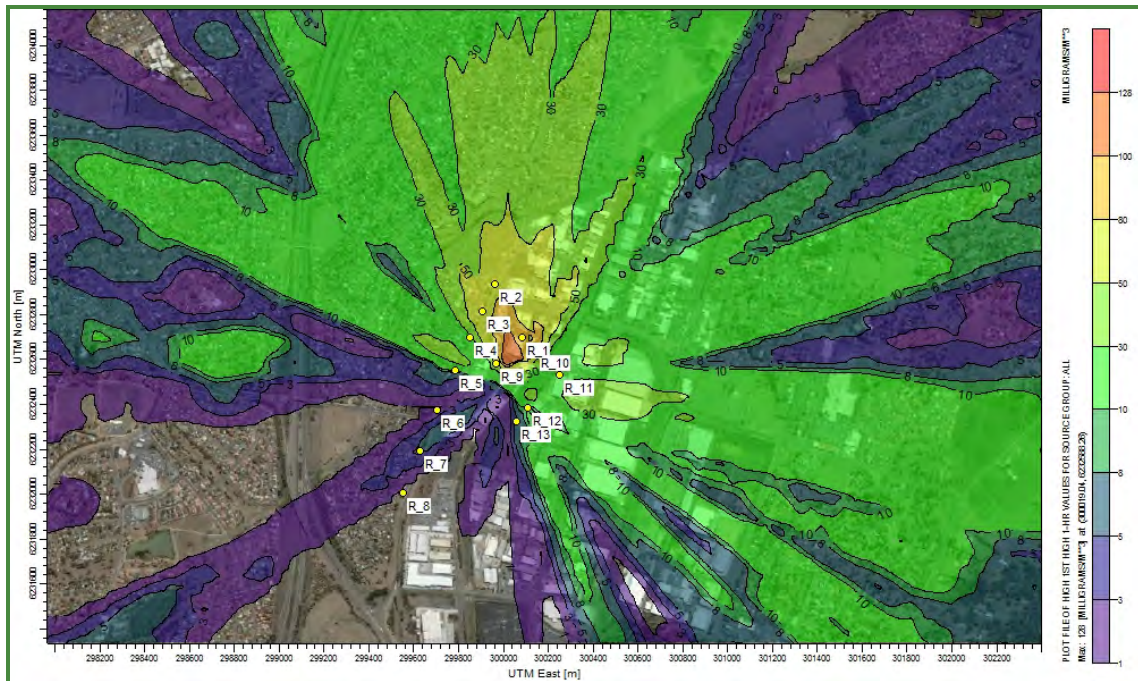
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 10.95 m which is equal to the pool fire diameter;
- Temperature of 117.9°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s

The next step involves estimation of ground level concentration and comparison to the ILDH and ERPG levels to determine potential consequences to the residential areas.

Table 4-13: Scenario 12: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 1,374.7mg	ERPG – 1 229.1 mg/m ³ exceeded	ERPG-2 401.0mg/m ³ exceeded	ERPG-3 572.8mg/m ³ exceeded
R1	94	No	No	No	No
R2	73	No	No	No	No
R3	74	No	No	No	No
R4	25	No	No	No	No
R5	9	No	No	No	No
R6	1.5	No	No	No	No
R7	5.5	No	No	No	No
R8	1	No	No	No	No
R9	44.5	No	No	No	No
R10	91	No	No	No	No
R11	17	No	No	No	No
R12	10.5	No	No	No	No
R13	6	No	No	No	No

Figure 4-13: Scenario 12: Ground Level Concentration of Carbon Monoxide Isopleth



Comment:

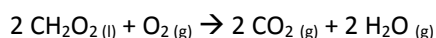
The IDLH limit and ERPG values were not exceeded at the identified sensitive receptors for this scenario.

4.4.8 Scenario 13: Ground level concentrations from a fire involving 100 kg of Formic acid for a 2 m² pool area

This scenario describes the event that a small fire had occurred involving the combustion of 100 kg of formic acid for a 2 m² area within the warehouse.

It was calculated that all of the 100 kg of formic acid would undergo complete combustion in this scenario as there would be enough air within the warehouse to combust 9068 kg of formic acid completely.

The combustion rate of formic acid was found to be approximately 0.02 kg/s (TNO Effects) while the rate of combustion products formation was calculated according to the stoichiometric ratio below:



The average molecular weights of formic acid and carbon dioxide are 46.03 g/mole and 44.01 g/mole respectively. This equates to the release of 47.8 kg of carbon dioxide. TNO effects estimated that the combustion of these products would take 88 minutes to complete. An emission rate of 9.03 g/s of CO₂ was used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

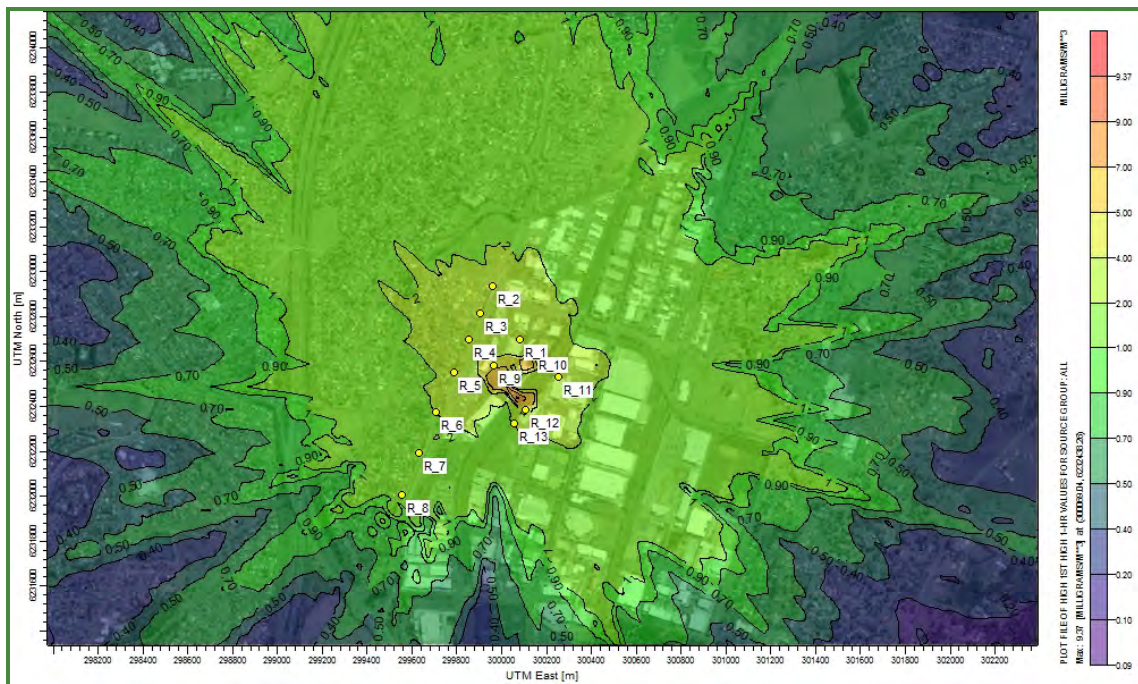
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 1.41 m which is equal to the pool fire diameter;
- Temperature of 101°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s

The next step involves estimation of ground level concentration and comparison to the ILDH and ERPG levels to determine potential consequences to the residential areas.

Table 4-14: Scenario 13: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 72,000 mg/m ³ exceeded
R1	3	No
R2	2.5	No
R3	3	No
R4	3	No
R5	3	No
R6	2	No
R7	2	No
R8	1	No
R9	5	No
R10	4	No
R11	3	No
R12	4	No
R13	2	No

Figure 4-14: Scenario 13: Ground Level Concentration of Carbon Dioxide Isopleth



Comment:

The IDLH limit was not exceeded at the identified sensitive receptors for this scenario.

4.4.9 Scenario 14: Ground level concentrations from a fire involving 5000 kg of Formic acid for a 30 m² pool area

This scenario describes the event that a fire had occurred involving the combustion of 5000 kg of formic acid for a 30 m² area within the warehouse.

It was calculated that all of the 5000 kg of formic acid would undergo complete combustion in this scenario as there would be enough air within the warehouse to combust 9068 kg of formic acid completely.

The combustion rate of formic acid was found to be approximately 0.28 kg/s (TNO Effects). The average molecular weights of formic acid and carbon dioxide are 46.03 g/mole and 44.01 g/mole respectively. This equates to the release of 2390.5 kg of carbon dioxide. TNO effects estimated that the combustion of these products would take 294 minutes to complete. An emission rate of 135.4 g/s for CO was used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

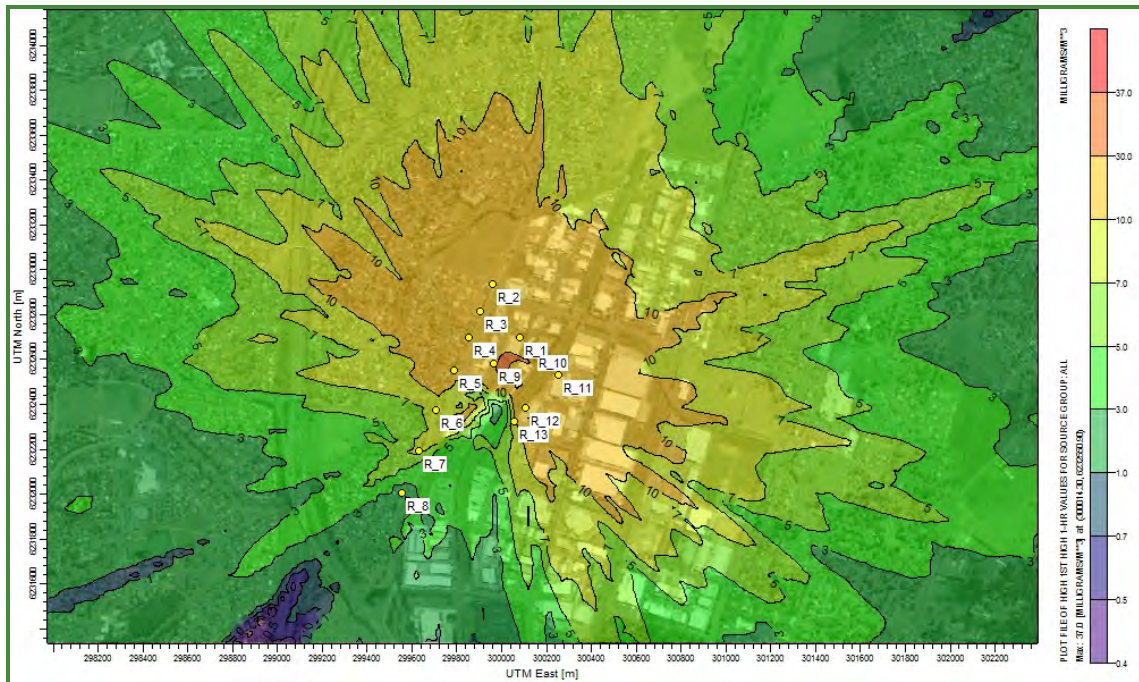
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 5.48 m which is equal to the pool fire diameter;
- Temperature of 101°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s

The next step involves estimation of ground level concentration and comparison to the ILDH and ERPG levels to determine potential consequences to the residential areas.

Table 4-15: Scenario 14: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 72,000 mg/m ³ exceeded
R1	23	No
R2	18	No
R3	19	No
R4	22	No
R5	13	No
R6	7	No
R7	8	No
R8	3	No
R9	30	No
R10	24	No
R11	20	No
R12	12.5	No
R13	9	No

Figure 4-15: Scenario 14: Ground Level Concentration of Carbon Dioxide Isopleth



Comment:

The IDLH limit was not exceeded at the identified sensitive receptors for this scenario.

4.4.10 Scenario 15: Ground level concentrations from a fire involving 30,000 kg of Formic acid for a 30 m² pool area

This scenario describes the event that a small fire had occurred involving the combustion of 30,000 kg of formic acid for a 30 m² area within the warehouse.

It was calculated that there would only be enough oxygen to fully combust 9068 kg of formic acid completely. As such incomplete combustion is expected to occur.

The combustion rate of formic acid was found to be approximately 0.28 kg/s (TNO Effects). The average molecular weights of formic acid, carbon dioxide and carbon monoxide are 46.03 g/mole, 44.01 g/mole, and 28.01 g/mol respectively. This equates to the release of 14,343 kg of carbon dioxide and 18,257 kg of carbon monoxide. TNO effects estimated that the combustion of these products would take 1766 minutes to complete. Emission rates of 135.4 and 172.3 g/s for CO₂ and CO respectively were used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

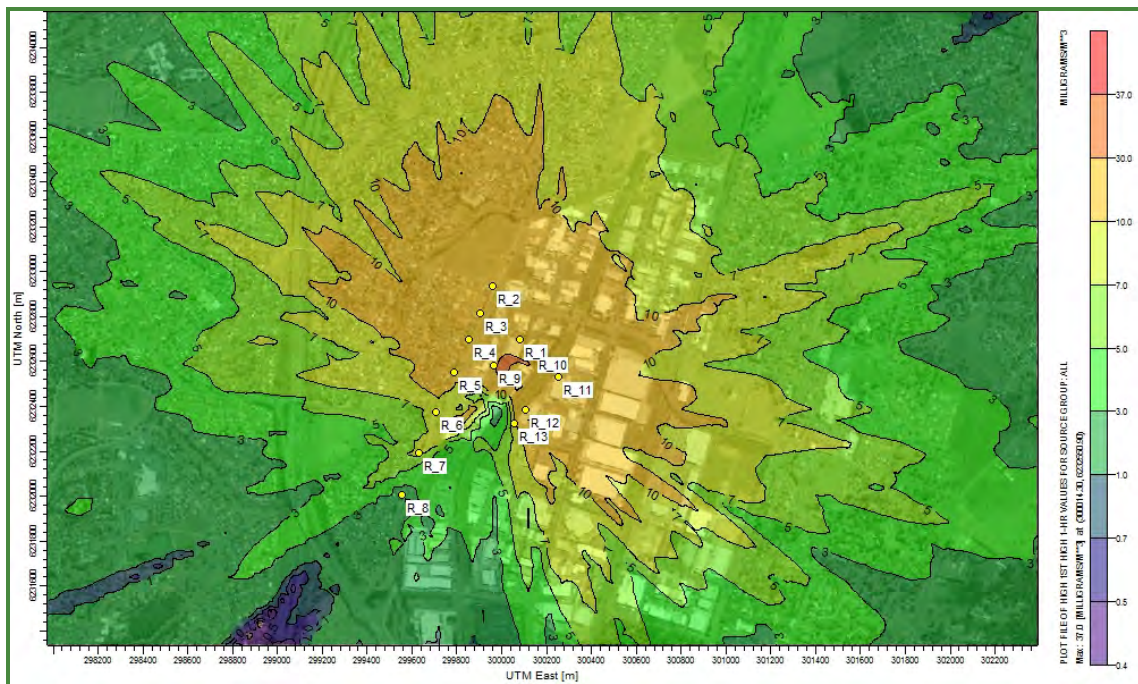
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 5.48 m which is equal to the pool fire diameter;
- Temperature of 101°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s

The next step involves estimation of ground level concentration and comparison to the ILDH and ERPG levels to determine potential consequences to the residential areas.

Table 4-16: Scenario 15: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 72,000 mg/m ³ exceeded
R1	23	No
R2	18	No
R3	19	No
R4	22	No
R5	13	No
R6	7	No
R7	8	No
R8	3	No
R9	29	No
R10	24	No
R11	20	No
R12	13	No
R13	9	No

Figure 4-16: Scenario 15: Ground Level Concentration of Carbon Dioxide Isopleth



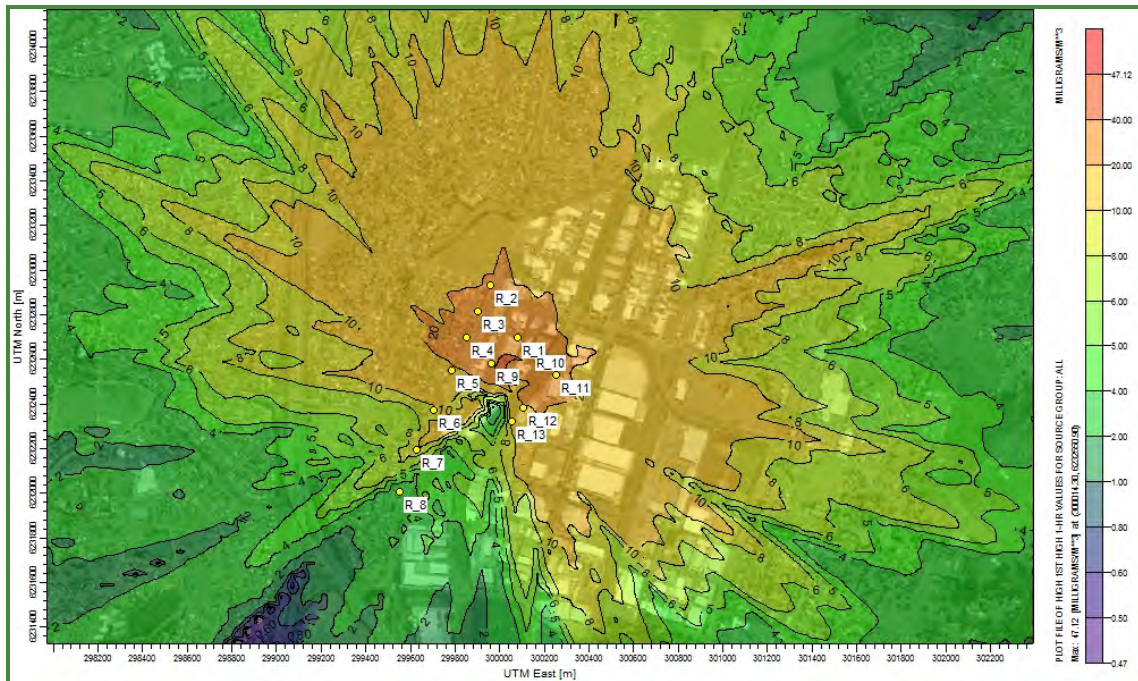
Comment:

The IDLH limit was not exceeded at the identified sensitive receptors for this scenario.

Table 4-17: Scenario 15: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 1,374.7mg	ERPG – 1 229.1 mg/m ³ exceeded	ERPG-2 401.0mg/m ³ exceeded	ERPG-3 572.8mg/m ³ exceeded
R1	30	No	No	No	No
R2	22	No	No	No	No
R3	24	No	No	No	No
R4	28	No	No	No	No
R5	16	No	No	No	No
R6	9	No	No	No	No
R7	10	No	No	No	No
R8	3.5	No	No	No	No
R9	37.5	No	No	No	No
R10	31	No	No	No	No
R11	25.5	No	No	No	No
R12	16	No	No	No	No
R13	11	No	No	No	No

Figure 4-17: Scenario 15: Ground Level Concentration of Carbon Monoxide Isopleth



Comment:

The IDLH limit was not exceeded at the identified sensitive receptors for this scenario.



4.4.11 Scenario 16: Ground level concentrations from a fire involving 5,000 kg of Formic acid for a 120 m² pool area

This scenario describes the event that a small fire had occurred involving the combustion of 5,000 kg of formic acid for a 120 m² area within the warehouse.

It was calculated that all of the 5000 kg of formic acid would undergo complete combustion in this scenario as there would be enough air within the warehouse to combust 9068 kg of formic acid completely.

The combustion rate of formic acid was found to be approximately 1.13 kg/s (TNO Effects). The average molecular weights of formic acid and carbon dioxide are 46.03 g/mole and 44.01 g/mole respectively. This equates to the release of 2390.5 kg of carbon dioxide. TNO effects estimated that the combustion of these products would take 74 minutes to complete. An emission rate of 541.6 g/s for CO₂ was used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

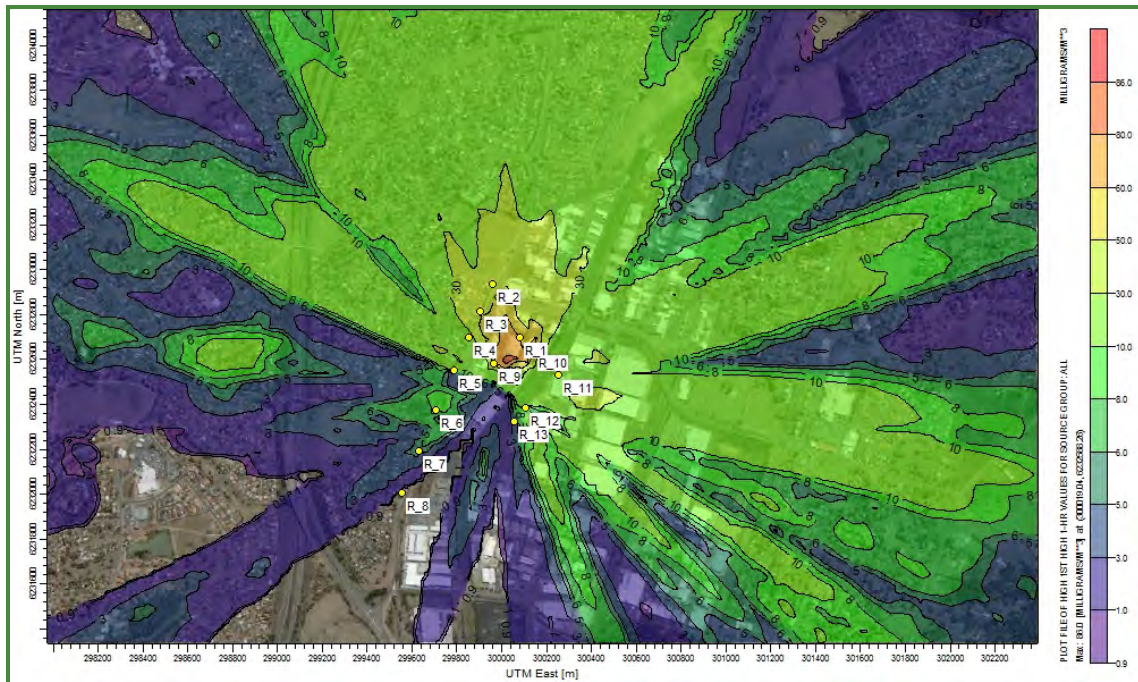
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 10.95 m which is equal to the pool fire diameter;
- Temperature of 101°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s

The next step involves estimation of ground level concentration and comparison to the ILDH and ERPG levels to determine potential consequences to the residential areas.

Table 4-18: Scenario 16: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 72,000 mg/m ³ exceeded
R1	61	No
R2	46	No
R3	51.5	No
R4	20	No
R5	7	No
R6	9	No
R7	5.5	No
R8	1	No
R9	51	No
R10	62	No
R11	23	No
R12	10	No
R13	3.5	No

Figure 4-18: Scenario 16: Ground Level Concentration of Carbon Dioxide Isopleth



Comment:

The IDLH limit was not exceeded at the identified sensitive receptors for this scenario.

4.4.12 Scenario 17: Ground level concentrations from a fire involving 30,000 kg of Formic acid for a 120 m² pool area

This scenario describes the event that a small fire had occurred involving the combustion of 30,000 kg of formic acid for a 120 m² area within the warehouse.

It was calculated that there would only be enough oxygen to fully combust 9068 kg of formic acid completely. As such incomplete combustion is expected to occur.

The combustion rate of formic acid was found to be approximately 1.13 kg/s (TNO Effects). The average molecular weights of formic acid, carbon dioxide and carbon monoxide are 46.03 g/mole, 44.01 g/mole, and 28.01 g/mol respectively. This equates to the release of 14,343 kg of carbon dioxide and 18,257 kg of carbon monoxide. TNO effects estimated that the combustion of these products would take 441 minutes to complete. Emission rates of 541.6 and 689.4 g/s for CO₂ and CO respectively were used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

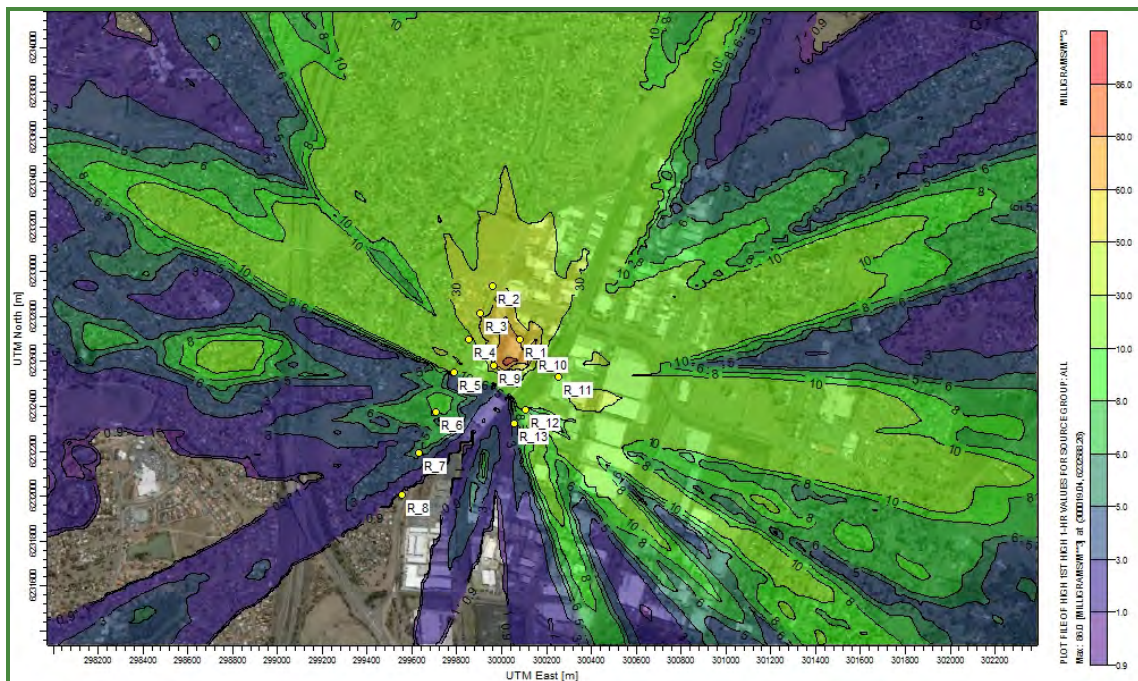
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 10.95 m which is equal to the pool fire diameter;
- Temperature of 101°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s

The next step involves estimation of ground level concentration and comparison to the ILDH and ERPG levels to determine potential consequences to the residential areas.

Table 4-19: Scenario 17: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 72,000 mg/m ³ exceeded
R1	61	No
R2	46	No
R3	51.5	No
R4	20	No
R5	7	No
R6	9	No
R7	6	No
R8	1	No
R9	51	No
R10	62	No
R11	23	No
R12	10	No
R13	4	No

Figure 4-19: Scenario 17: Ground Level Concentration of Carbon Dioxide Isopleth



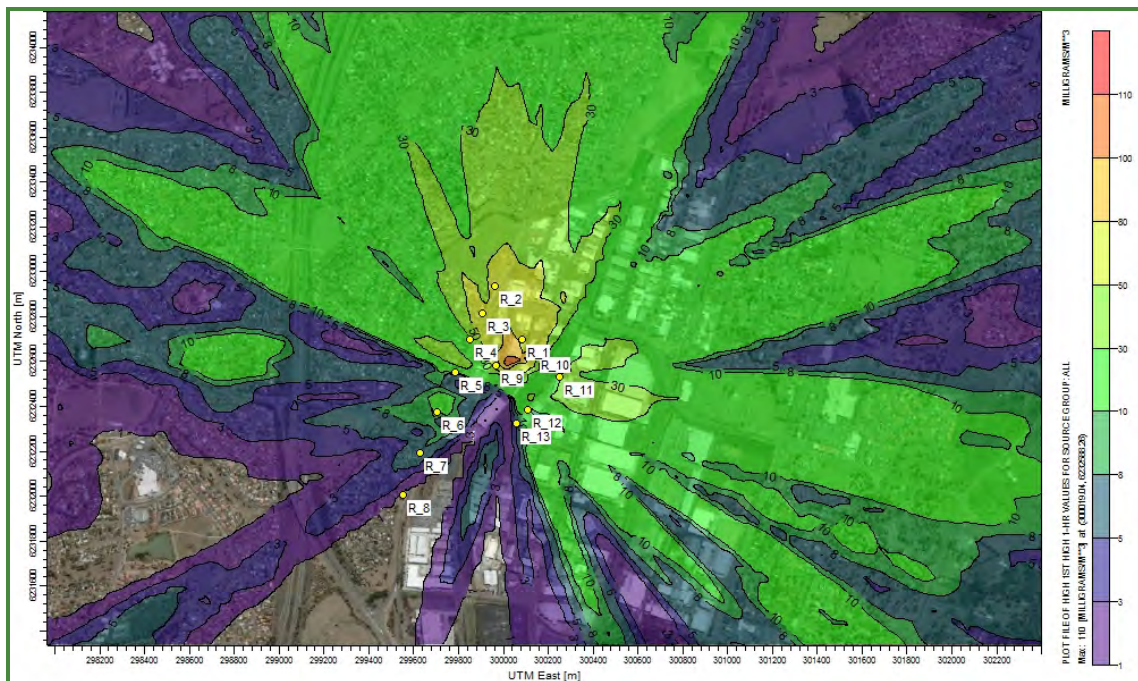
Comment:

The IDLH limit was not exceeded at the identified sensitive receptors for this scenario.

Table 4-20: Scenario 17: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 1,374.7mg	ERPG – 1 229.1 mg/m ³ exceeded	ERPG-2 401.0mg/m ³ exceeded	ERPG-3 572.8mg/m ³ exceeded
R1	78	No	No	No	No
R2	59	No	No	No	No
R3	66	No	No	No	No
R4	25	No	No	No	No
R5	9	No	No	No	No
R6	12	No	No	No	No
R7	7	No	No	No	No
R8	1	No	No	No	No
R9	65	No	No	No	No
R10	79	No	No	No	No
R11	30	No	No	No	No
R12	13	No	No	No	No
R13	5	No	No	No	No

Figure 4-20: Scenario 17: Ground Level Concentration of Carbon Monoxide Isopleth



Comment:

The IDLH limit was not exceeded at the identified sensitive receptors for this scenario.

5. FIRE PREVENTION AND PROTECTION STRATEGY

This section outlines the fire protection strategy, including fire protection equipment, recommended for the Site.

5.1 SUMMARY OF FIRE SAFETY REQUIREMENTS

This section provides a summary of the fire safety requirements for the proposed development as a result of the preparation of a Fire Safety Study to the Guidelines of the Hazardous Industry Planning and Advisory Paper No. 2 – *Fire Safety Study Guidelines*.

5.1.1 Characteristics of the Development

The particular characteristics of the development that are considered in the fire safety study are the transport on site, the handling on site and storage of Class 8(3), class 8 and food grade chemicals.

The Class 8(3) have flammable liquid of PGII and III, citric acid a food grade chemical is C1 combustible.

This design reduces the volume of three “tank farms” rather than having a much higher volume stored in a larger tank farm.

The purpose of the separate storage areas is to ensure the volume of liquid available for a fire is contained to a much smaller volume and to provide fire walls on three sides of each storage area so that the heat of radiation is contained and dissipates away from the building.

The size of the potential “pool fire” is also reduced to the floor area of the storage area. The surface of the floor area is then more readily covered by foam from the proposed new hydrants.

5.1.2 Potential Health Impacts due to Air Emissions from Fire Incident

The air pollutants emitted during a major fire engulfing the storage tanks may cause health impacts. The impacts are assessed by undertaking air impact modelling for the air pollutants that would be generated during a major fire.

The hazards arising from a fire may be assessed using the following guidelines:

- Approved Methods for Modelling and Assessment of Air Pollutants in New South Wales (AMMAAP), published by the Office of Environment and Heritage;
- Immediately Dangerous to Life and Health Concentrations, published by Center for Disease Control and Prevention; and
- Other similar studies undertaken by Benbow Environmental for major combustible and flammable liquids and previously assessed by Fire and Rescue NSW.

5.1.3 Review of Fire Prevention and Protection Strategy

This section presents a discussion of the fire prevention and protection measures to be implemented at the site. These measures are aimed to achieve several objectives:



- Protect the building on-site from damage caused by a fire;
- Protect off-site buildings and facilities from risk of life and safety and property damage;
- Protect the environment from accidental releases of liquid or from fire fighting water during an emergency event; and
- Prevent cumulative hazards occurring that could impact on existing warehouses.

5.2 DISCUSSION OF RESULTS

The heat of radiation calculations show that a fire involving 3,000 kg could expose the alkali storage tanks to sufficient heat to lead to tank failure. This could then cause this alkali to be decomposed and release toxic gases

To prevent this from being a credible event the following safeguards were included in the design of the Stage IV Facility.

- 240/240/240 fire rated walls between the three sets of bulk storage tanks i.e. the acids–alkali have a 240/240/240 fire rated wall and similarly the alkali-food grades. This design also provides effective separation distances.
- Within the acids tank farm the following would be provided
 - ▶ The acetic and formic acids would be stored at either end of the tank farm to maximise separation whenever this is practical to do so.
 - ▶ The acid tanks would each have intervening bund walls of a height less than the perimeter bund wall of the acid tank farm. This would contain a spill and a pool fire during its initial ignition.
- The tanker unloading/loading areas for acids have been separated from this similar area for the alkali and food grade chemicals.

This confines a pool fire so that it is less able to envelope the alkali and food grade chemicals.

The two separated tanker unloading /loading would also be graded in opposite directions. A sump would be provide at the far ends of these two areas.

This practice would also aid the fire fighting of a pool fire during the initial stage of fire development.

- Each of the four acid storage tanks would be provided with cooling water based on the design requirements from AS 1940 such that ~28 litres/second is required per tank.

This water supply capacity is in addition to the water supply required for hose reels and hydrants.

These safeguards are basic measures that are needed and reduce the risk of a fire event to a minimal level.

The release of toxic fume from a large spill involving either acetic or formic acid could under unfavourable wind conditions expose receivers to irritating levels of these chemicals. Although a large spill within the Stage IV Facility is extremely unlikely and has not occurred at the Deltrex Girraween site, a number of safeguards have been designed into the facility.

5.2.1 AS 1940–2017 *The storage and handling of flammable and combustible liquids*

Section 11.12 Fire Protection requirements for above-ground tank storage of aggregate capacity 60 m³–2000 m³, section 11.12.5 Class C2 Liquids of AS 1940 states:

Where only Class C2 liquid is stored, the normal fire protection provisions of the building or site shall be sufficient.

Where flammable liquids are stored then at least two extinguishers, one of which may be foam and the remainder powder.

Section 11.7 Fire Protection Requirements for Tank Vehicle Transfer Areas

“11.7.1 Location of extinguishers

The position of extinguishers shall be chosen to optimize access in an emergency. The following considerations should be taken into account:

- (a) At least one powder-type extinguisher should be at ground level at each loading location position. For a top-loading installation at least one additional powder-type extinguisher should be at the loading platform.*
- (b) All foam type extinguishers should be at ground level within 10 m of the loading point,*
- (c) Locations should be on approach or exit paths.*
- (d) Access to any extinguisher should not be vulnerable to blockage by fire.”*

The proposed development has a bottom loading operation, therefore a powder-type extinguisher is not required at the loading platform. Three (3) fire extinguishers are located at the tanker unloading location and also at the entrance and exit ends of the awning covering the tanker unloading areas. These are on approach/exit paths and are not vulnerable to blockage by fire.

Hose reels which have foam with a foam making branch pipe with pickup tab (also referred to as a foam injection kit).

Section 11.7 has no requirements for road tank vehicle loading areas, rail tank vehicle loading areas and tank vehicle delivery locations for combustible liquids.

AS 1940–2017 Clauses 11.3 General Requirements for Fire Protection Equipment, 11.4 Portable Fire Extinguishers, 11.5 Fixed Fire protection and Detection Systems, 11.6 Fire Extinguisher Requirements for Product Pumps, Manifolds and Hose Connection Points, 11.14 Piping and Pumping Systems, 11.15 Cooling Water and 11.16 Fixed Foam Systems for Tanks, will be addressed in sections 5.2.7 and 5.2.8 of this report.

5.2.2 Building Classification and Construction

The buildings on site contain areas with different classifications as defined by Volume 1 Part A3 of the National Construction Code (NCC), as follows:

- Industrial Units – Class 8: *a laboratory, or a building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried on for trade, sale, or gain.*



The building floor is constructed of a reinforced concrete slab. The warehouse would not be utilised at this stage of development, any changes will be subject to further approval.

The external property is hardstand, and has been inspected by a certified civil engineer and a concrete slab is required to ensure adequate imperviousness and structural integrity to support the loads produced by the tanks, structure and bunding.

The warehouse building is a large isolated building and is then classified as Type A construction.

5.2.3 Ventilation

The warehouse is naturally ventilated, while the control room area would incorporate mechanical ventilation by the air conditioning unit.

Mechanical ventilation would be used for fume capture at the bulk storage tanks, the diluting/decanting tanks and the filling points.

The tanker unloading area has openings at either end of the awning i.e. at the entrance and exit for road tankers.

5.2.4 Ignition Sources

The storage and handling of Class 8(3) liquids will generate hazardous areas as the sub risk Class 3 characteristics are PGIII.

The most likely sources of ignition are:

- Hot work such as welding, grinding and cutting of steel in the vicinity of the tanks.
- Malfunction of electric motors if such was placed inside one of the tank storage areas.
- Fire from some other activity.
- Cavitation of a pump transferring the liquid.

The risk of an ignition source igniting the sub 3 flammable liquids is high.

There would be strict control of ignition sources on-site. An Emergency Plan and a Pollution Incident Risk Management Plan both would need to be in place.

5.2.5 Security and Signage

The site would be locked and secure to prevent unauthorised access to the site outside normal operating hours. The Site is fully fenced and secure. The security is maintained externally by the licensed security company.

Identification numbers will be greater than 500 mm high on the outside walls of the tanks clearly visible as per AS 1940–2004 Clause 5.2.2.

A DANGER – NO SMOKING, NO NAKED FLAMES sign and a COMBUSTIBLE LIQUID sign will be placed at the entrance to each storage area.

A WARNING – RESTRICTED AREA, AUTHORIZED PERSONNEL ONLY sign, a sign listing the emergency contact names, titles, and phone numbers relevant to installation, the name, address and phone number of the occupier and a layout diagram showing the location of fixed fire protection facilities, drainage system and the 'Emergency Stop' switch shall be displayed at both entrances to the premises as per AS 1940–2004 Clause 3.8.2.

5.2.6 Provision for Escape

Provision for escape during the event of fire must be in accordance with Part D1 of Volume One the National Construction Code (NCC). Exit travel distances would satisfy the requirements of 40 m, with emergency exits available at both the front and rear of the building.

5.2.7 Fire Detection

The main system for fire detection is a smoke alarm. This automated system is in compliance with the relative AS 2118 and NCC's Table E2.2A, AS 1670 and AS 1603.5.

As per AS 1940–2004 , Clause 1.5.2 states:

- (a) Any automatic system shall be capable of being manually activated at clearly identified positions.*
- (b) The warning signal of the alarm system shall be sufficiently distinguishable from other signals to permit ready recognition, and shall be clearly audible throughout the whole installation, unless it can be demonstrated that audibility over a limited area is justified.*
NOTE: In addition, a visual alarm system should be considered in areas of excessive noise.
- (c) The power supply for any alarm system shall be independent of the main electricity isolating switch for the area*
- (d) Any mandatory fire alarm system shall be connected to a fire station nominated by the relevant fire authority or 24 h monitoring service. The latter shall immediately notify the nominated fire station in the event of the fire alarm being activated.*
- (e) Manual actuation points shall be located at convenient and safe locations near work stations.*

These requirements are consistent with those of NSW Government, Work Safe, Storage and Handling of Dangerous Goods, Code of Practice 2005.

While the employees are at the site they would be able to quickly detect any fire/smoke via visual or odour recognition. Once such situations are detected, appropriate first response action can be taken.

There are also smoke detectors installed in the warehouse and in the office area. Smoke detectors in these areas would be wired to a Fire Indication Panel located in the reception area of the Office.

5.2.8 Fire Protection Equipment

This section details the fire services available at the facility.

5.2.8.1 Fire Hydrants

According to Section E1.3 of Volume One of the NCC a fire hydrant system is required to serve the building as the floor area of the building exceeds 500 m². Since the building on site had a floor area greater than 500 m², a fire hydrant system must be provided at the site. A hydrant ring main will be installed around the perimeter of the Stage IV facility with three hydrant locations. The fire hydrant system would need to be in accordance with AS 2419.1–2005/Amdt 1-2007.

5.2.8.2 Fire Hose Reels

Section E1.4 of Volume 1 of the NCC states:

- (b) A fire hose reel system must be provided-*
- (i) to serve the whole building where one or more internal fire hydrants are installed;*
 - or*
 - (ii) where internal fire hydrants are not installed, to serve any fire compartment with a floor area greater than 500 m².*

Since the building on site has a floor area greater than 500 m², a fire hose reel system is required at the site. The fire hose reels would be installed in accordance with AS 2441–2005/Amdt 1–2009 and AS/NZS 1221–1997/Amdt 1–2003.

AS 1940–2004 Clause 11.5.3 states:

“Foam hose reels shall be fitted with a foam-making branchpipe with pick-up tube capable of producing 27 L/min of foam solution at a minimum of 220 kPa for 30 mins.”

All hose reels will be located within protective cabinets to prevent damage from the environment as recommended by *NSW Government, Work Safe, Storage and Handling of Dangerous Goods, Code of Practice 2005*.

All hose reels will be at least 30 m long. It is clear that at least one hose reel can access any location within the site as required by *NSW Government, Work Safe, Storage and Handling of Dangerous Goods, Code of Practice 2005*.

Foam injection kits will be available along with 20 L of foam at each of these hose reels.

5.2.8.3 Fire Extinguishers

In accordance with Section E1.6 of Volume 1 of the NCC, fire extinguishers would be selected, located and distributed in accordance with AS 2444–2001.

Any fire extinguisher shall comply with the appropriate standard shown in the table below:

Table 5-1: Standards for Portable Fire Extinguishers

Type Of Portable Fire Extinguisher	Standard
Foam type	AS/NZS 1841.4
Powder type	AS/NSZ 1841.4
Carbon dioxide type	AS/NZS 1841.6
Wheeled fire extinguishers	AS 4265
Selection and location	AS 2444
Classification of extinguisher	AS/NZS 1850

Source: AS 1940–2004 Clause 11.4.1.

AS 1940–2004 Clause 11.6 states:

“11.6.1 Product pumps

A pump installation for handling flammable or combustible liquid shall be provide with at least one powder-type extinguisher not less than 3 m nor more than 10 m from each risk being protected.

11.6.2 Manifolds and hose connection points

Except as otherwise required by this section, a powder-type extinguisher shall be provided within 10 m of a hose connection point or manifold.”

No pump installation is necessary to meet the performance requirements of the water supply system. Powder-type extinguishers shall be within 10 m of each hose connection point or manifold.

5.2.8.4 Piping and Pumping Systems

No pumping is necessary to meet the performance requirements of the water supply system.

Pipework has been designed by a certified fire safety engineer, Adrian Fuentes. As stated in AS 1940–2004, pipework and fittings shall be in accordance with AS 4041. Pipe materials shall be not less than AS 1074 medium weight or Schedule 40 medium weight. Pipe supports shall be in accordance with AS 2118 and AS 2419.

As stated in AS 1940–2004:

Any manually-operated isolating valves, used in a water or foam system shall be full-flow outside screw and yoke wheel gate valves or butterfly valves closed by turning the wheel clockwise.

The open and shut position shall be obvious and the direction of closing clearly marked.



5.2.8.5 Cooling Water

AS 1940–2004 has cooling water requirements for the sub risk 3 flammable liquids. A deluge system will be needed above the four tanks in the acid tank farm. Cooling water flow would be ~28 litres/second per tank.

5.2.8.6 Fixed Foam Systems

Fixed foam systems are a requirement of AS 1940–2004 or *NSW Government, Work Safe, Storage and Handling of Dangerous Goods, Code of Practice 2005* for the storage of Class 3 flammable combustible liquids. Foam injection kits will be available along with 20 L of foam at each hose reels.

6. CONTAINMENT OF CONTAMINATED FIREFIGHTING WATER

The methodology for calculating the amount of contaminated firefighting water to be contained and the methodology of containment follow the recommendations in the document *HIPAP No. 2 - Fire Safety Study Guidelines* (DoP 2011) and the *Best Practice Guidelines for Contaminated Water Retention and Treatment Systems* (HMPCC 1994).

6.1 IDENTIFICATION OF MATERIALS AND HAZARDS

A potential hazard that could occur on the site that would produce contaminated water would be a fire. It is expected that the firewater used to fight or contain a fire would become contaminated due to liquid being released in the event of tank/hose/fitting failure.

During a fire event it is expected that depending on the location and extent of the fire some of the liquid would be combusted. The liquid and the products of burning liquid would therefore contaminate the spent firewater.

6.2 CONSEQUENCES OF CONTAMINATED FIRE WATER

If no system were in place to contain used firewater then it would enter the site stormwater system, and would flow off site, into local waterways (Maxwells Creek) or directly enter Maxwells Creek. If the water was contaminated with significant levels of hazardous materials, there is the potential for an impact on the waterways. In recognition of this a containment system has been devised and has been put into place.

6.3 ESTIMATION OF POTENTIAL CONTAMINATED FIREWATER VOLUMES

The primary method to capture the contaminated firewater is the implementation of bunding for the entire site. The height of the bund would need to be 160 mm along the perimeter of the sites hardstand surface.

A worst-case fire scenario at the site has been used to calculate the maximum amount of contaminated firewater that would be generated in such an event. This would involve a fire consuming a large proportion of the Site and the Fire Brigade using a large number of services available, which include the following:

- 3 Fire Hydrants.

Thus the discharges of these for 90 minutes will be equal to:



Table 6-1: Required Containment of Contaminated Firewater

Total Containment Required	
<u>Fire Hydrants</u>	
Operational Discharge of 20 L/s	432,000 L
20 L/s x 60 s/min x 90 min = 108,000 L	
4 x 108,000 L = 432,000 L	
Total Requirement of Firewater Containment	432,000 L
Containment already exists – exceeds 432,000L	

6.4 ANALYSIS OF CONTAMINATED FIRE FIGHTING WATER, TREATMENT AND DISPOSAL

Fire fighting water would require analysis prior to being removed from the site. Pending the results, the water would be either disposed off-site by a licensed liquid disposal contractor or discharged to stormwater.

Analysis would involve sampling the firewater with the subsequent analysis conducted by a NATA accredited laboratory. The water would be analysed for specific analytes based on the location of fire and the types of contaminants that may have potentially contaminated the firewater. The results of the analysis would be compared against the current Australian water quality benchmarks. If the criteria are satisfied, the water would be discharged to stormwater. Otherwise the water would have to be pumped into a series of road tankers and disposed by a licensed liquid disposal contractor.

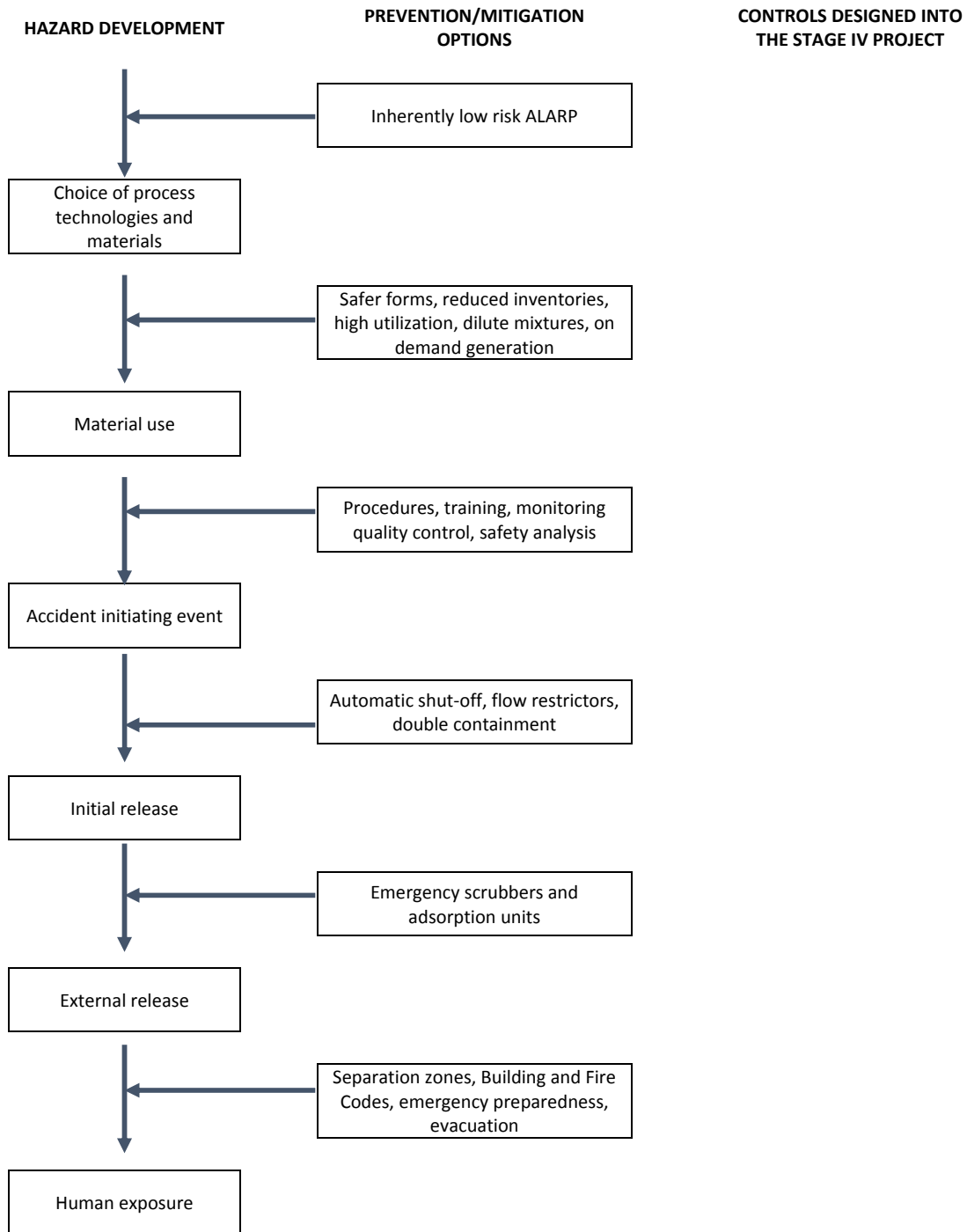
The firewater would be held on site for the time taken for analysis to be completed. The maximum time expected would be 24 hours. If at any stage rain threatened the contaminated firewater storage to overflow then the contained waters would be immediately assumed to be contaminated and a licensed contractor commissioned to pump the contaminated water and remove from site.

7. RECOMMENDATIONS

The following safeguards are considered to be fundamental to control any of the fire risks presented by the site:

- A fire hydrant system is to be provided in accordance with the NCC and AS 2419.1–2005/Amdt 1-2007;
 - A hose reel system is to be provided in accordance with the NCC and AS 2441–2005/Amdt 1-2009;
 - Foam injection kits and 20 L of foam need to be installed and training undertaken;
 - Fire extinguishers to be provided at the site in accordance with the NCC and AS 2444–2001;
 - Fire services at the site are to be maintained in accordance with AS 1851–2012;
 - Emergency lighting and exit signage are to be provided in accordance with the NCC and AS 2293;
 - An occupant warning system in accordance with the NCC and AS 1670.4–2004;
 - A comprehensive Emergency Plan and a Pollution Incident Risk Management Plan need to be developed for the site;
 - Specific on-site personnel are to be trained in specific site procedures, emergency procedures and the use of fire extinguishers and hose reels;
 - Strict control of ignition sources to be enforced on site;
 - Fire alarm and detection system in accordance with Clause 5(b) of specification E2.2a of the BCA and AS 1670.1–2015.
 - Fire services as described in Section 5 of this report;
 - The tank farm separated into at least four areas with dividing concrete walls 1.5 m high;
 - The external walls of the building constructed to 240/240/240 FRL;
 - All access doorways designed to –/180/30 FRL;
 - A triple bunding system provided from application of the following approach:
 - ▶ Tank farm bunded to AS 1940–2004;
 - ▶ Tanker unloading/loading area bunded;
 - ▶ Filling area/staging area of filled containers, drums and IBCs bunded;
 - ▶ Building would have bunding; and
 - ▶ Site already has stormwater isolation in place.
 - Cooling water on the four acid storage tanks.
 - Accident prevention and mitigation
- An effective approach to achieving these twin goals has been developed by specialist industry groups as a consequence of catastrophic spillages of liquids or uncontrolled toxic gas releases.

The following diagram and comparison to the recommendations included in the design of the Stage IV project provides a useful hazard reduction checklist.



8. CONCLUSIONS

The fire safety study has assessed fire incidents and recommended a number of effective safeguards.

The fire safety study has found there would be no off site impacts or hazards to sensitive receivers.

This concludes the report.

A handwritten signature in black ink, appearing to read 'L. Zanotto'.

Linda Zanotto
Senior Environmental Engineer

A handwritten signature in black ink, appearing to read 'R T Benbow'.

R T Benbow
Principal Consultant

9. REFERENCES

1. AS 1603– 1974 *Automatic fire detection and alarm systems* (Set)
2. AS 1670.1–2015 *Fire detection, warning, control and intercom systems – System design, installation and commissioning – Fire*
3. AS 1670.4–2004 *Fire detection, warning, control and intercom systems – System design, installation and commissioning – Emergency warning and intercom systems*
4. AS 1692–2006 *Steel tanks for flammable and combustible liquids*
5. AS 1851–2012 *Maintenance of fire protection systems and equipment.*
6. AS 1940–2004 *The storage and handling of flammable and combustible liquids.*
7. DRAFT AS 1940–2017 *The storage and handling of flammable and combustible liquids.*
8. AS 2118–2006 *Automatic fire sprinkler systems* (Set).
9. AS 2293.3–2005 *Emergency escape lighting and exit signs for buildings Part 3: Emergency escape luminaires and exit signs.*
10. AS 2419.1–2005 *Fire hydrant installations – System design, installation and commissioning.*
11. AS 2419.2–2009 *Fire hydrant installations – Fire hydrant valves.*
12. AS 2419.3–2012 *Fire hydrant installations – Fire brigade booster connections.*
13. AS 2441–2005 *Installation of fire hose reels.*
14. AS 2444–2001 *Portable fire extinguishers and fire blankets - Selection and location.*
15. AS 4265–1995 *Wheeled fire extinguishers*
16. AS/NZS 1221:1997 *Fire hose reels*
17. AS/NZS 1841:2007 *Portable fire extinguishers* (Set).
18. AS/NZS 1850:2009 *Portable fire extinguishers – Classification, rating and performance testing*
19. Building Code of Australia (BCA)
20. *Hazardous Industry Planning and Advisory Paper No 2 – Fire Safety Study Guidelines* (HIPAP No 2, (DoP 2011))
21. *Hazardous Industry Planning Advisory Paper No 6 – Guidelines for Hazard Analysis* (DoP 2011)
22. NFPA 30 15th Edition. *Flammable and Combustible Liquids Code*
23. *Fire Protection Handbook* 18th Edition, NFPA
24. *The SFPE Handbook of Fire Protection Engineering*, NFPA Third Edition
25. *Industrial Fire Hazards* NFPA Third Edition
26. Vasilis, M. Fthenakis, (1996) Department of Applied Science, Brookhaven National Laboratory, Upton New York. *Approaches for preventing and mitigating accidental gaseous chemical releases*
27. Sherin, Brian J., (1989) *Risk assessment and control of toxic gas releases* Environmental Health and Safety Specialists, Hewlett Packard Corporation
28. Moshowitz, P.D, Fthenakis, V.M and Kalb, P.D. (1988) *Preventing and controlling accidental gas releases* AIP Conference Proceedings, p.166.
29. *Manual for the Classification and Prioritization of Risks due to major accidents in process and related industries* International Atomic Energy Agency, Vienna (1996)



10. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

This report has been prepared solely for the use of Redox Pty Ltd, as per our agreement for providing environmental services. Only Redox Pty Ltd is entitled to rely upon the findings in the report within the scope of work described in this report. Otherwise, no responsibility is accepted for the use of any part of the report by another in any other context or for any other purpose.

Although all due care has been taken in the preparation of this study, no warranty is given, nor liability accepted (except that otherwise required by law) in relation to any of the information contained within this document. We accept no responsibility for the accuracy of any data or information provided to us by Redox Pty Ltd for the purposes of preparing this report.

Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.

ATTACHMENTS

Dangerous Goods Stock Manifest

Stock Summary

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Class	Sub. Risks	Pack Group	Quantity Packaged		Quantity Bulk	
			Weight (kg)	Volume (L)	Weight (kg)	Volume (L)
3		II	3,137.476	3,891.047	1.000	1.075
3		III	17,668.162	28,944.471	26.227	27.350
3	6.1	II	1.484	1.873		
3	8	II	2,521.725	3,551.583		
4.1		II	0.700	2.557		
4.1		III	22.450	15.996		
4.2		II	0.270	0.298		
4.2		III	5.000	7.059		
4.3		III	0.400	0.175		
5.1		II	9.090	9.313		
5.1		III	41.750	55.244		
5.1	6.1	II	0.230	0.092		
5.1	6.1	III	97.400	152.680		
5.1	8	II	1.200	1.140		
5.1	8	III	0.800	0.640		
6.1		I	0.200	0.124		
6.1		II	0.010	0.010		
6.1		III	103,804.000	133,888.522		
6.1	8	II	0.300	0.240		
6.1		II	1.050	0.991		
6.1		III	0.450	0.360		
8		II	286,435.323	365,099.296	0.200	0.132
8		III	116,438.801	114,702.780		
8	3	I	0.500	0.499		
8	3	II	17.653	17.332		
8	6.1	II	251.000	300.876		
8	6.1	III	1,080.600	217.064		
8		II	8,710.050	9,939.989		

Dangerous Goods Stock Manifest

Stock Summary

		Location		Date	
		Redox Pty Ltd 4 Holmes Road Minto NSW 2566 Australia		2/11/2016	
				Emergency Contact 1	
				Emergency Contact 2	
8	III	26,978.700	35,302.577		
9	III	1,225.400	1,317.628		
Combustible Liquid (CL)		20,295.422	25,041.047	4.000	5.000

Dangerous Goods Stock Manifest

Stock by Building

Building B1 / ALGLET1500 to OILCEL1025

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ALGLET1500	Alkyl Glycidyl Ether Alkyl Glycidyl Ether	20160429: B14	1.44 tonne 8 x 180 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 68609-97-2 Xi, N	pH	Neutral
ALHYDR5600	Enersol L PETROLEUM DISTILLATES, N.O.S. (ALIPHATIC HYDROCARBON)	2980014: B14	0.8 KLTR 4 x 200 L drums	Class UN Number Poison Sch.	3 1268 5	Sub. Risk(s) Pack Group Hazchem	N/A II 3WE	Physical State CAS Number	Liquid 64742-89-8 F+, Xn, Xi, Carc. 2, Muta. 2	pH	N/A
BRFLUI4600	Brake Fluid Dot 4 (XHD 260) 220kg Drums BRAKE FLUID DOT4	2913148B: B14	0.88 tonne 4 x 220 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 143-22-6 Xi	pH	Alkali
CASODA1300	Caustic Soda Pearl SODIUM HYDROXIDE, SOLID	60301: B14	0.1 tonne 4 x 25 kg bags	Class UN Number Poison Sch.	8 1823 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2W	Physical State CAS Number	Solid 1310-73-2 C	pH	Conc. Str. Alkali
DIPENT1000	Dipentene DIPENTENE	452120215: B14	1.4 tonne 8 x 175 kg drums	Class UN Number Poison Sch.	3 2052 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III 3Y	Physical State CAS Number	Liquid 138-86-3 Xi, N	pH	N/A
DIQUPO2000	ABIL QUAT 3272 Diquaternary Polydimethylsiloxane	E516403685: B12	0.4 tonne 2 x 200 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 13473-05-6	pH	Alkali
DIQUPO2001	ABIL QUAT 3272 Diquaternary Polydimethylsiloxane	E516403672: B12	0.125 tonne 5 x 25 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 13473-05-6	pH	Alkali
DYBARB2700	AUTOMATE Red IK HF - 20kg Dye Automate Red IK HF	YY00FCS130: B11	220 kg 11 x 20 kg pails	Class UN Number Poison Sch.	CL N/A 5	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 71819-51-7 Xn	pH	Neutral
ETGLBE1502	Ethyl Glycol Monobutyl Ether ETHYL GLYCOL MONOBUTYL ETHER	3101695: B14	4.4 tonne 5 x 880 kg IBCs	Class UN Number Poison Sch.	CL N/A 6	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 111-76-2 Xn	pH	N/A
OILCEL1025	Celery Seed Oil "A" - 401/213 Celery seed Oil	3107642: B11	0.025 tonne 5 x 5 kg drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 8015-90-5 Xn	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building B1 / POLYIN4701 to SOLONE5500

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

	Description		Quantity								
Code	Proper Shipping Name	Batch(es) / Area(s)	Packs	Hazard Classification							
POLYIN4701	CHEMCURE 147	3000592771: B13	3049.6 kg	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	Corrosive Liquid, N.O.S. (Contains Diethylenetriamine & Tetraethylenepentamine)		16 x 190.6 kg drums	UN Number	1760	Pack Group	III	CAS Number			
				Poison Sch.	N/A	Hazchem	2X		Xi		
PRGLME9800	Propyleneglycol Monomethyl Ether	3238369: B13	15.2 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	1-METHOXY-2-PROPANOL		80 x 190 kg drums	UN Number	3092	Pack Group	III	CAS Number	107-98-2		
				Poison Sch.	N/A	Hazchem	•2Y				
PTFEAA0600	Dryfilm RA/IPA	3216915: B11	15.88 kg	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	ISOPROPANOL (ISOPROPYL ALCOHOL)		1 x 15.88 kg pails	UN Number	1219	Pack Group	II	CAS Number	Various		
				Poison Sch.	Not schedule d	Hazchem	•2YE		F, Xi		
SOLAET3220	SLES 70% 2EO(N) Low Dioxane	3198246B: B12	0.48 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		2 x 240 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
				Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
SOLONE5500	Shellsol A	2529619: B11	0.2 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	PETROLEUM DISTILLATES, N.O.S.(PETROLEUM NAPHTHA)		1 x 200 L drums	UN Number	1268	Pack Group	III	CAS Number	64742-95-6		
				Poison Sch.	5	Hazchem	3Y		Xn, N		

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / ACACID9800 to CYNONE6800

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

	Description			Quantity								
Code	Proper Shipping Name	Batch(es) / Area(s)		Packs			Hazard Classification					
ACACID9800	Acetic Acid 90% 20 Litre	C02000: CABINET SHELF (Sample)	0.0108 KLTR	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid	
	ACETIC ACID SOLUTION, more than 80% acid, by mass		0.54 x 20 L drums	UN Number	2789	Pack Group	II	CAS Number	64-19-7			
				Poison Sch.	6	Hazchem	●2P		C, C			
ACETON0200	Acetone	122341A: CABINET-F4 (Sample)	0.0005 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A	
	ACETONE		0.003125 x 160 kg drums	UN Number	1090	Pack Group	II	CAS Number	67-64-1			
				Poison Sch.	5	Hazchem	●2YE		F, Xi			
ALHYDR3200	Redsol D30	67949: CABINET-F2 (Sample)	0.00045 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A	
	HYDROCARBON, LIQUID N.O.S (ISONANES AND N-NONANE)		0.002195 x 205 L drums	UN Number	3295	Pack Group	III	CAS Number	64742-48-9			
				Poison Sch.	5	Hazchem	3W		Xn			
ALHYDR5200	X55 Solvent (Unmarked)	S13786: CABINET-F2 (Sample)	0.0005 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A	
	PETROLEUM DISTILLATES, N.O.S. (Solvent Naphtha)		0.0025 x 200 L drums	UN Number	1268	Pack Group	II	CAS Number	64742-89-8			
				Poison Sch.	5	Hazchem	3YE		F, Xn, N			
ALHYDR7100	White Spirits	1913021: CABINET C1 (Sample)	0.0005 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A	
	TURPENTINE SUBSTITUTE		0.0025 x 200 L drums	UN Number	1300	Pack Group	III	CAS Number	64742-82-1			
				Poison Sch.	5	Hazchem	3Y		N, Xn			
ALHYDR8600	White Spirits 205Ltr Drums	S13536: CABINET-F3 (Sample)	0.0002 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A	
	PETROLEUM DISTILLATES, N.O.S.(CONTAINS WHITE SPIRITS)		0.000975 x 205 L drums	UN Number	1268	Pack Group	II	CAS Number	64742-89-8			
				Poison Sch.	5	Hazchem	3WE		F, Xn			
ALHYDR9800	White Spirit (Unmarked)	77563: CABINET-F2 (Sample)	0.0012 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A	
	TURPENTINE SUBSTITUTE		1.2 x 1 L bulk	UN Number	1300	Pack Group	III	CAS Number	64742-82-1			
				Poison Sch.	5	Hazchem	3Y		Xn, N			
BUACEI1000	Butyl Acetate Industrial	56136: CABINET-F4 (Sample)	0.00078 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid	
	BUTYL ACETATES		0.004333 x 180 kg drums	UN Number	1123	Pack Group	III	CAS Number	123-86-4			
				Poison Sch.	Not schedule d	Hazchem	3YE		Xn			
BUACET1000	Butyl Acetate Urethane Grade	31909: CABINET-F4 (Sample)	0.002 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid	
	BUTYL ACETATES		0.011111 x 180 kg drums	UN Number	1123	Pack Group	III	CAS Number	123-86-4			
				Poison Sch.	Not schedule d	Hazchem	3YE		Xn			
BUTANO3001	Butanol Normal	102121: CABINET-F2 (Sample)	0.0003 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A	
	BUTANOLS		0.001796 x 167 kg drums	UN Number	1120	Pack Group	III	CAS Number	71-36-3			
				Poison Sch.	Not schedule d	Hazchem	●2Y		Xn			
CYNONE6800	Cyclohexanone	86451: CABINET-F1 (Sample)	0.001 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A	
	CYCLOHEXANONE		0.005263 x 190 kg drums	UN Number	1915	Pack Group	III	CAS Number	108-94-1			
				Poison Sch.	N/A	Hazchem	●3Y		Xn			

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / DEHYAM3001 to DRICOB1500

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
DEHYAM3001	N,N-Diethylhydroxylamine DEHA FLAMMABLE LIQUID, N.O.S. (N,N-DIETHYLHYDROXYLAMINE)	S14856: CABINET-F3 (Sample)	0.0005 tonne 0.002941 x 170 kg drums	Class UN Number Poison Sch.	3 1993 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •3Y	Physical State CAS Number	Liquid 3710-84-7 Xn	pH	Alkali
DEHYAM5000	Diethylhydroxylamine 85% FLAMMABLE LIQUID, N.O.S. (N,N-DIETHYLHYDROXYLAMINE)	L148851: B21	0.185 tonne 1 x 185 kg drums	Class UN Number Poison Sch.	3 1993 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •3Y	Physical State CAS Number	Liquid 3710-84-7 Xn	pH	Alkali
DEMISP4000	SPIRDANE D 40S PETROLEUM DISTILLATES, N.O.S.(Naphtha (Petroleum), Hydrotreated Heavy)	84763: CABINET-F3 (Sample) 84765: CABINET-F1 (Sample)	0.0167 KLTR 16.7 x 1 L bulk	Class UN Number Poison Sch.	3 1268 5	Sub. Risk(s) Pack Group Hazchem	N/A III 3Y	Physical State CAS Number	Liquid 64742-48-9 Xn	pH	N/A
DEMISP6500	SPIRDANE D60 Spirdane D-60	20100640: CABINET-C8 (Sample) 84764: CABINET-C10 (Sample) S15068: CABINET-C10 (Sample)	0.00429 KLTR 0.02145 x 200 L drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 64742-48-9 Xn	pH	N/A
DIACAL1700	Diacetone Alcohol DIACETONE ALCOHOL	70449: CABINET-F3 (Sample)	0.00002 tonne 0.000102 x 195 kg drums	Class UN Number Poison Sch.	3 1148 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III •2Y	Physical State CAS Number	Liquid 123-42-2 Xi	pH	N/A
DIETHY1000	Diethylamine DIETHYLAMINE	2704070: B24 3189493: B23	2.52 tonne 18 x 140 kg drums	Class UN Number Poison Sch.	3 1154 Not schedule d	Sub. Risk(s) Pack Group Hazchem	8 II •2WE	Physical State CAS Number	Liquid 109-89-7 F, C	pH	Alkali
DIGLDI1000	Diethyleneglycol Dim. Ether FLAMMABLE LIQUID N.O.S (DIETHYLENEGLYCOL DIMETHYL ETHER)	S13295: CABINET-F3 (Sample)	0.0006 tonne 0.003076 x 195 kg drums	Class UN Number Poison Sch.	3 1993 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •3Y	Physical State CAS Number	Liquid 111-96-6 Xn, Xi	pH	N/A
DIPGME6500	Dipropyleneglycol Methyl Ether Dipropylene Glycol Monomethyl Ether	107293A: CABINET-C3 (Sample)	0.0003 tonne 0.001578 x 190 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 34590-94-8	pH	N/A
DIQUPO2000	ABIL QUAT 3272 Diquaternary Polydimethylsiloxane	E516303516: B22	0.2 tonne 1 x 200 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 13473-05-6	pH	Alkali
DRICOB1500	Drier - Cobalt Octoate 6% DRIER - COBALT OCTOATE 6%	S12577: CABINET-F4 (Sample)	0.00006 tonne 0.000333 x 180 kg drums	Class UN Number Poison Sch.	CL N/A 5	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid Various N, Xn	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / DYBAGM1000 to ISOPAR4200

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
DYBAGM1000	AUTOMATE GREEN HFX 20kg Pail	YY00G85270: B22	40 kg	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	AUTOMATE GREEN HFX LIQUID DYE		2 x 20 kg pails	UN Number	N/A	Pack Group	N/A	CAS Number	64742-94-5		
DYBARB2050	AUTOMATE RED IK HF 4 x 5kg Carton	YY00E7L073: B21	5 each	Poison Sch.	N/A	Hazchem	N/A	Xn, N			
	Dye Automate Red IK HF		5 x 1 each cartons	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	Neutral
DYBARB2700	AUTOMATE Red IK HF - 20kg	YY00F3K253: B22 YY00FCS130: B22	140 kg	UN Number	N/A	Pack Group	N/A	CAS Number	71819-51-7		
	Dye Automate Red IK HF		7 x 20 kg pails	Poison Sch.	5	Hazchem	N/A	Xn			
EPRESA1100	Epoxy Resin KER 1001-X-75	74539: CABINET-F1 (Sample)	0.001 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	RESIN SOLUTION		0.005 x 200 kg drums	UN Number	1866	Pack Group	III	CAS Number	25036-25-3		
ETALCO1500	95% SG Ethanol Bonded	S13333: CABINET-F2 (Sample)	0.0002 KLTR	Poison Sch.	N/A	Hazchem	•3Y	Xn			
	ETHANOL (ETHYL ALCOHOL) or ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)		0.001 x 200 L drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
ETALCO3000	Ethanol 95 (Bonded)	74163: CABINET-F4 (Sample) 87994: CABINET (Sample)	0.0005 KLTR	UN Number	1170	Pack Group	II	CAS Number	64-17-5		
	ETHANOL (ETHYL ALCOHOL) or ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)		0.0025 x 200 L drums	Poison Sch.	Not scheduled	Hazchem	•2YE	F			
ETETPR3000	Ethyl 3-Ethoxypropionate	136840: CABINET-F3 (Sample)	0.002 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	ESTERS, N.O.S. (ethyl 3-ethoxypropionate)		0.010526 x 190 kg drums	UN Number	3272	Pack Group	III	CAS Number	763-69-9		
ETETPR4000	Ethyl 3-Ethoxypropionate	EEP/201110P16: CABINET C1 (Sample)	0.00075 tonne	Poison Sch.	N/A	Hazchem	•3Y	Xn			
	ESTERS, N.O.S. (ethyl 3-ethoxypropionate)		0.00375 x 200 kg drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
ETGLBE6935	Ethylene Glycol Monobutyl Ether	3229145B: B24	0.54 tonne	UN Number	3272	Pack Group	III	CAS Number	763-69-9		
	ETHYL GLYCOL MONOBUTYL ETHER		3 x 180 kg drums	Poison Sch.	N/A	Hazchem	•3Y	Xn			
ETHYLP1000	N-Ethylpyrrolidone-2	S14778: CABINET-C7 (Sample)	0.0005 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	Alkali
	N-ETHYLPYRROLIDONE-2		0.0025 x 200 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	2687-91-4		
ISOPAR3200	SK Isol-G	C11421: CABINET-F1 (Sample)	0.0002 tonne	Poison Sch.	N/A	Hazchem	N/A	Xi			
	PETROLEUM DISTILLATES, N.O.S. (Naphtha (Petroleum) Hydrotreated Heavy)		0.001351 x 148 kg drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
ISOPAR4200	Isopar H	117272B: CABINET-F1 (Sample)	0.0002 KLTR	UN Number	1268	Pack Group	III	CAS Number	64742-48-9		
	HYDROCARBONS, LIQUID, N.O.S (Naphtha (petroleum), hydrotreated heavy)		0.00098 x 204 L drums	Poison Sch.	5	Hazchem	3Y	Xn, Carc. 2, Muta. 2			
				Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
				UN Number	3295	Pack Group	III	CAS Number	64742-48-9		
				Poison Sch.	5	Hazchem	3Y	Xn, F			

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / ISOPAR5000 to MESPSP2000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity	Hazard Classification							
	Proper Shipping Name		Packs								
ISOPAR5000	Isopar L	L134053: CABINET-C6 (Sample)	0.0005 KLTR	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	ISOPAR L		0.0025 x 200 L drums	UN Number	N/A	Pack Group	N/A	CAS Number	64742-48-9		
ISPRAC1000	Iso Propyl Acetate	61655: CABINET-F1 (Sample)	0.00035 tonne	Poison Sch.	5	Hazchem	N/A		Xn		
	ISOPROPYL ACETATE		0.001944 x 180 kg drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
KEROSE5000	Kerosene - High Flash	S13598: CABINET-SHELF (Sample)	0.005 KLTR	UN Number	1220	Pack Group	II	CAS Number	108-21-4		
	KEROSENE HIGH FLASH POINT		5 x 1 L bulk	Poison Sch.	N/A	Hazchem	•3YE		F+		
KEROSE8100	Kerosene	83903: CABINET-F3 (Sample)	0.0005 KLTR	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	KEROSENE		0.0025 x 200 L drums	UN Number	N/A	Pack Group	N/A	CAS Number	64741-44-2		
LIMONE3094	D-Limonene	3062688: B23	0.692 tonne	Poison Sch.	5	Hazchem	N/A		Xn		
	TERPENE HYDROCARBONS, N.O.S. (D-LIMONENE)		4 x 173 kg drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
MEACET2000	Methyl Acetate (Meac) 99.5%	007197: CABINET-F3 (Sample)	0.003 tonne	UN Number	2319	Pack Group	III	CAS Number	8028-48-6		
	METHYL ACETATE		0.015789 x 190 kg drums	Poison Sch.	Not scheduled	Hazchem	3Y		Xn, N		
MEISBU2000	Methyl Iso Butyl Ketone	77462: CABINET-F2 (Sample)	0.00045 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	METHYL ISOBUTYL KETONE		0.002727 x 165 kg drums	UN Number	1245	Pack Group	II	CAS Number	108-10-1		
MEISCA5000	Methyl Isobutyl Carbinol	091228: CABINET-F4 (Sample)	0.001 tonne	Poison Sch.	5	Hazchem	•3YE		F, Xn		
	METHYL ISOBUTYL CARBINOL		0.00625 x 160 kg drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
MEPRAC4000	Methoxypropyl Acetate	142866: CABINET F1 (Sample)	0.001 tonne	UN Number	2053	Pack Group	III	CAS Number	108-11-2		
	ESTERS, N.O.S. (2-METHOXY-1-METHYLETHYL ACETATE, 2-METHOXYPROPYL ACETATE)		0.005 x 200 kg drums	Poison Sch.	N/A	Hazchem	•3Y		Xi		
MEPYRR5100	Methyl-2-Pyrrolidone Min 99.9%	3082292: B24	4.2 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	N-Methyl-2-Pyrrolidone		20 x 210 kg drums	UN Number	3272	Pack Group	III	CAS Number	108-65-6		
MESPIR4000	Methylated Spirits 95%	C24956: CABINET-F1 (Sample)	0.0006 KLTR	Poison Sch.	Not scheduled	Hazchem	•3Y		Xi		
	ETHANOL (ETHYL ALCOHOL)		0.003 x 200 L drums	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	Alkali
MESPSP2000	100% SMS F4 Bonded	C12561: CABINET-F3 (Sample)	0.0004 KLTR	UN Number	N/A	Pack Group	N/A	CAS Number	872-50-4		
	ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)		0.002 x 200 L drums	Poison Sch.	6	Hazchem	N/A		T, Repr. 2		
				Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
				UN Number	1170	Pack Group	II	CAS Number	64-17-5		
				Poison Sch.	5	Hazchem	•2YE		F		
				Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
				UN Number	1170	Pack Group	II	CAS Number	64-17-5		
				Poison Sch.	Not scheduled	Hazchem	•2YE		F, Xi		

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / MESPSP4000 to SOLAET6800

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
MESPSP4000	95% SMS F6 Bonded ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	C17217: CABINET-F1 (Sample)	0.0006 KLTR 0.003 x 200 L drums	Class UN Number Poison Sch.	3 1170 5	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid 64-17-5 F	pH	N/A
METHAN3000	Methanol METHANOL	C03093: CABINET-F (Sample), CABINET-F3 (Sample) SAMPLE: CABINET (Sample)	0.001284 tonne 0.008025 x 160 kg drums	Class UN Number Poison Sch.	3 1230 6	Sub. Risk(s) Pack Group Hazchem	6.1 II •2WE	Physical State CAS Number	Liquid 67-56-1 F, T	pH	N/A
NOPARA0500	Normal Paraffin C5-C6 FLAMMABLE LIQUID, N.O.S (N-PARAFFIN)	S12644: CABINET-C12 (Sample)	0.001 KLTR 0.005 x 200 L drums	Class UN Number Poison Sch.	3 1993 5	Sub. Risk(s) Pack Group Hazchem	N/A II •3YE	Physical State CAS Number	Liquid 8002-74-2 F	pH	N/A
OILORA5500	Oil - Orange TERPENE HYDROCARBONS, N.O.S. (ORANGE OIL)	76627B: CABINET-F1 (Sample)	0.00025 tonne 0.001445 x 173 kg drums	Class UN Number Poison Sch.	3 2319 5	Sub. Risk(s) Pack Group Hazchem	N/A III 3Y	Physical State CAS Number	Liquid 8028-48-6 Xi, N	pH	N/A
OLEBPP1100	Black Pepper Oil - 401/667 Oleoresins - Black Pepper	401F165945: B21	0.01 tonne 1 x 10 kg drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 84929-41-9 Xi	pH	N/A
OLECEL1000	Oleoresin Celery 8% - 401/199 Oleoresin - Celery	401H150544: B21	0.1 tonne 5 x 20 kg drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 89997-35-3 Xi	pH	N/A
PRACET2100	Propyl Acetate NPAC n-PROPYL ACETATE	85319: CABINET-F3 (Sample)	0.0002 tonne 0.001111 x 180 kg drums	Class UN Number Poison Sch.	3 1276 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid 109-60-4 F, Xi	pH	N/A
PRGLME1000	Propyleneglycol Monometh Ether 1-METHOXY-2-PROPANOL	104311: CABINET-F3 (Sample)	0.0006 tonne 0.003243 x 185 kg drums	Class UN Number Poison Sch.	3 3092 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •2Y	Physical State CAS Number	Liquid 107-98-2	pH	N/A
PRGLME7000	Propyleneglycol Monometh Ether 1-METHOXY-2-PROPANOL	77586: CABINET-F2 (Sample)	0.0002 tonne 0.001086 x 184 kg drums	Class UN Number Poison Sch.	3 3092 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •2Y	Physical State CAS Number	Liquid 107-98-2	pH	N/A
PRGLME8000	Propyleneglycol Monometh Ether 1-METHOXY-2-PROPANOL	91730: CABINET-F2 (Sample) 98418: CABINET-F3 (Sample)	0.0003 tonne 0.001578 x 190 kg drums	Class UN Number Poison Sch.	3 3092 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •2Y	Physical State CAS Number	Liquid 107-98-2	pH	N/A
SILSUR7000	Matestab AK-8818 SILICONE SURFACTANT AK-8818	S14550: CABINET-C7 (Sample)	0.00025 tonne 0.00125 x 200 kg drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 68938-54-5	pH	Acid
SOLAET6800	SLES 70% 2EO Natural 170kg drums Sodium Lauryl Ether Sulphate	3187036C: B21	6.8 tonne 40 x 170 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Solid 68891-38-3 Xi, N	pH	Alkali

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / SOLONE7500 to VIPYVE1200

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
SOLONE7500	Solvarex 9S (100)	82173: CABINET-F1 (Sample)	0.008591 tonne	Class 3	Sub. Risk(s) N/A	Physical State	Liquid	pH	N/A		
	PETROLEUM DISTILLATES, N.O.S. (Solvent naphtha (petroleum) light aromatic)		8.591 x 1 kg bulk	UN Number 1268 Poison Sch. 5	Pack Group III Hazchem 3Y	CAS Number	64742-95-6	Xn, N			
SOLVEN3050	Solvent 2026 200L Drums	3195172: B24	0.4 KLTR	Class 3	Sub. Risk(s) N/A	Physical State		pH	N/A		
	PETROLEUM DISTILLATES, N.O.S.		2 x 200 L drums	UN Number 1268 Poison Sch. 6	Pack Group II Hazchem 3YE	CAS Number	Mixture F+, Xn, N				
TEACET2500	Terpinyl Acetate 95%	S14901: CABINET-C2 (Sample)	0.00005 tonne	Class CL	Sub. Risk(s)	Physical State	Liquid	pH	N/A		
	TERPINYL ACETATE		0.00027 x 185 kg drums	UN Number N/A Poison Sch. N/A	Pack Group N/A Hazchem N/A	CAS Number	80-26-2				
TOLUEN5500	Toluene	84419: CABINET-F2 (Sample)	0.001 KLTR	Class 3	Sub. Risk(s) N/A	Physical State	Liquid	pH	N/A		
	TOLUENE		0.005 x 200 L drums	UN Number 1294 Poison Sch. 6	Pack Group II Hazchem 3YE	CAS Number	108-88-3	F, Xn, Repr. 3			
VIPYVE1200	PVP VA73E - 180kg Drums	82057: CABINET-F1 (Sample)	0.0002 tonne	Class 3	Sub. Risk(s) N/A	Physical State	Liquid	pH	N/A		
	RESIN SOLUTION, flammable		0.001111 x 180 kg drums	UN Number 1866 Poison Sch. N/A	Pack Group II Hazchem •3YE	CAS Number	Mixture F				

Dangerous Goods Stock Manifest

Stock by Building

Building C1 / CECHLO6110 to LUBEAD3250

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Description		Batch(es) / Area(s)	Quantity		Hazard Classification						
Code	Proper Shipping Name		Packs								
CECHLO6110	Cetrimonium Chloride 28-30%	3155245: C12	4.439 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (cetrimonium chloride)		23 x 193 kg drums	UN Number	3267	Pack Group	II	CAS Number			
				Poison Sch.	Not schedule d	Hazchem	2X		Xn, N		
LUBEAD3250	VISCOPLEX 0-030 175kg Drum	1408271180: C11	1.225 tonne	Class	9	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	ELEVATED TEMPERATURE LIQUID, N.O.S. (contains MINERAL OIL)		7 x 175 kg drums	UN Number	3257	Pack Group	III	CAS Number			
				Poison Sch.	Not schedule d	Hazchem	2Y				

Dangerous Goods Stock Manifest

Stock by Building

Building C3 / BESOTH2600 to ISDIAM6000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
BESOTH2600	PROXEL GXL CAUSTIC ALKALI LIQUID, N.O.S.(SODIUM HYDROXIDE AND BENZISOTHIAZOLIN-3-ONE)	3808670: C31	0.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			1 x 200 kg drums	UN Number	1719	Pack Group	II	CAS Number	2634-33-5		
CAPOTA1200	Caustic Potash Flk POTASSIUM HYDROXIDE, SOLID	16.05.18: C34	1.1 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
			44 x 25 kg bags	UN Number	1813	Pack Group	II	CAS Number	1310-58-3		
CAPOTA1300	Caustic Potash Flk 500kg POTASSIUM HYDROXIDE, SOLID	15.02.01: C34 (Reject)	2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
			4 x 500 kg bags	UN Number	1813	Pack Group	II	CAS Number	1310-58-3		
CAPOTA1900	Caustic Potash Flake 25kg POTASSIUM HYDROXIDE, SOLID	20160804: C34	8.575 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
			343 x 25 kg bags	UN Number	1813	Pack Group	II	CAS Number	1310-58-3		
CASODA1100	Caustic Soda Pearl SODIUM HYDROXIDE, SOLID	00416: C36	21 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			840 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA5000	Caustic Soda Micropearl SODIUM HYDROXIDE, SOLID	3186420A: C34 3209630A: C34 3222866A: C34	96.675 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			3867 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA8200	Caustic Soda Micropearls SODIUM HYDROXIDE, SOLID	3223733A: C34	16.85 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			674 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
DICHLO1500	Dichlorophene - Liquid CORROSIVE LIQUID, N.O.S. (Contains Sodium Hydroxide)	DCN-L/F/1602001: C31	1.575 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
			7 x 225 kg drums	UN Number	1760	Pack Group	II	CAS Number	97-23-4		
EDTATL7800	EDTA Tetrasodium Salt 40% Liq CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (contains Tetrasodium EDTA)	3161343B: C31 3194329D: C31 3220535C: C32	12 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			12 x 1000 kg IBCs	UN Number	3267	Pack Group	III	CAS Number	64-02-8		
ISDIAM6000	Isophorone Diamine ISOPHORONEDIAMINE	3203230: C33	0.9 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
			5 x 180 kg drums	UN Number	2289	Pack Group	III	CAS Number	2855-13-2		

Dangerous Goods Stock Manifest

Stock by Building

Building C3 / LIHYDR2215 to SOMESI3200

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
LIHYDR2215	Lithium Hydroxide Monohydrate LITHIUM HYDROXIDE	3224932: C31	0.25 tonne 10 x 25 kg bags	Class UN Number Poison Sch.	8 2680 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 1310-66-3 C	pH	Conc. Str. Alkali
MEXYDI5000	Meta Xylene Diamine 200kg Drum AMINES, LIQUID, CORROSIVE, N.O.S. (m-XYLENEDIAMINE, 99%)	3110747A: C31	0.8 tonne 4 x 200 kg drums	Class UN Number Poison Sch.	8 2735 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 1477-55-0 C, Xn	pH	Alkali
NONPHE3001	Nonyl Phenol ALKYLPHENOLS, LIQUID, N.O.S. (including C2-C12 homologues)	3196877: C34	9.12 tonne 48 x 190 kg drums	Class UN Number Poison Sch.	8 3145 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 84852-15-3 C, N	pH	Alkali
SOHYDR1150	Sodium Hydrosulphide 900kg SODIUM HYDROSULPHIDE, HYDRATED, with not less than 25% water of crystallization	2727301: C34 (Reject)	1.8 tonne 2 x 900 kg bulkers	Class UN Number Poison Sch.	8 2949 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 16721-80-5 C	pH	Conc. Str. Alkali
SOHYDR2000	Sodium Hydrosulphide Flake SODIUM HYDROSULPHIDE, HYDRATED, with not less than 25% water of crystallization	3136242: C33 3216352A: C34	32.125 tonne 1285 x 25 kg bags	Class UN Number Poison Sch.	8 2949 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 16721-80-5 C	pH	Conc. Str. Alkali
SOMESE3200	Sodium Metasilicate Penta 25kg DISODIUM TRIOXOSILICATE	3214149: C36	40.55 tonne 1622 x 25 kg bags	Class UN Number Poison Sch.	8 3253 5	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 10213-79-3 C	pH	Conc. Str. Alkali
SOMESE4200	Sodium Metasilicate Penta DISODIUM TRIOXOSILICATE	3074315: C34	0.825 tonne 33 x 25 kg bags	Class UN Number Poison Sch.	8 3253 5	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 10213-79-3 C	pH	Conc. Str. Alkali
SOMESE6100	Sodium Metasilicate Penta Fine DISODIUM TRIOXOSILICATE	3208331: C33	19.575 tonne 783 x 25 kg bags	Class UN Number Poison Sch.	8 3253 5	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 10213-79-3 C	pH	Conc. Str. Alkali
SOMESI3200	Sodium Metasilicate Anhydrous DISODIUM TRIOXOSILICATE	3150378: C35	15.9 tonne 636 x 25 kg bags	Class UN Number Poison Sch.	8 3253 5	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 6834-92-0 C	pH	Conc. Str. Alkali

Dangerous Goods Stock Manifest

Stock by Building

Building C3 / SOSULF2900 to TRETTE4000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
SOSULF2900	Sodium Sulfide 10ppm	2693859B: C31 (Reject)	0.05 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str.
	SODIUM SULPHIDE, HYDRATED with not less than 30% water		2 x 25 kg bags	UN Number Poison Sch.	1849 Not schedule d	Pack Group Hazchem	II 2X	CAS Number	27610-45-3 C, N, T		Alkali
SOSULF3000	Sodium Sulphide 30ppm	3092289: C36	8 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str.
	SODIUM SULPHIDE, HYDRATED with not less than 30% water		320 x 25 kg bags	UN Number Poison Sch.	1849 Not schedule d	Pack Group Hazchem	II 2X	CAS Number	27610-45-3 C, N, T		Alkali
SUFBIO1002	REWOCID WK 30	3097051: C35	0.41 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	CORROSIVE LIQUID, N.O.S. (microbicidal amphoteric surfactants)		2 x 205 kg drums	UN Number Poison Sch.	1760 N/A	Pack Group Hazchem	II 2X	CAS Number	Various C, N		
TDMAMP2000	Tri(Dimethylaminomethyl)Phenol	3083482: C31 3183930: C31	5.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	AMINES, LIQUID, CORROSIVE N.O.S.(TRIS-2,4,6-(DIMETHYLAMINOMETHYL)PHENOL)		26 x 200 kg drums	UN Number Poison Sch.	2735 Not schedule d	Pack Group Hazchem	II 3X	CAS Number	90-72-2 Xn, Xi		
TDMAMP2001	Tri(Dimethylaminomethyl)Phenol	3094088: C36	11.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	AMINES, LIQUID, CORROSIVE N.O.S.(TRIS-2,4,6-(DIMETHYLAMINOMETHYL)PHENOL)		56 x 200 kg drums	UN Number Poison Sch.	2735 Not schedule d	Pack Group Hazchem	II 3X	CAS Number	90-72-2 Xn, Xi		
TOLYLJ2500	Tolyltriazole Liq. 50% IBC	3190556: C33 3201443: C34	3.6 tonne	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Alkali
	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (Tolyltriazole, Sodium Salt)		3 x 1200 kg IBCs	UN Number Poison Sch.	3267 N/A	Pack Group Hazchem	III 2X	CAS Number	64665-57-2 C, Xn		
TRETTE4000	Triethylene Tetramine	3091771: C34	16 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str.
	TRIETHYLENETETRAMINE		80 x 200 kg drums	UN Number Poison Sch.	2259 N/A	Pack Group Hazchem	II 2X	CAS Number	112-24-3 C, N		Alkali

Dangerous Goods Stock Manifest

Stock by Building

Building D1 / ACACID1921 to HYACID1900

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACACID1921	Acetic Acid 75% ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass	SSBP140108: D12 (Reject)	0.21 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			1 x 210 kg drums	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
ACTEPO2210	Terpolymer XF-3100 CORROSIVE LIQUID, ACIDIC, ORGANIC N.O.S. (Acrylic Acid/2-Acrylamido-2-methylpropanesulfonic Acid Terpolymer)	3246566: D14	0.48 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 240 kg drums	UN Number	3265	Pack Group	II	CAS Number	Xi, C		
AMBIFL1100	Ammonium Bifluoride 98% Min AMMONIUM HYDROGENDIFLUORIDE, SOLID	3180504: D13	3.025 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
			121 x 25 kg bags	UN Number	1727	Pack Group	II	CAS Number	1341-49-7		
FORMAL1810	Formalin 37/7 (APVMA) 20L Carboys FORMALDEHYDE SOLUTION with not less than 25% formaldehyde	3801923: D13	1.68 KLTR	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
			84 x 20 L carboys	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
FORMAL1816	Formalin 37/7 (APVMA) 200L Drums FORMALDEHYDE SOLUTION with not less than 25% formaldehyde	60815AF42: D11 60921AF41: D14	2.2 KLTR	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
			11 x 200 L drums	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
FORMAL8500	Formaldehyde 37/7 (Industrial) 22kg Carboys FORMALDEHYDE SOLUTION with not less than 25% formaldehyde	60921AF41: D14	2.508 tonne	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
			114 x 22 kg carboys	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
FORMAL8600	Formaldehyde 37/7 Industrial (Seajay) 22kg Carboys FORMALDEHYDE SOLUTION with not less than 25% formaldehyde	3808183: D12	3.52 tonne	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
			160 x 22 kg carboys	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
GLACID1010	Glycolic Acid 70% Solution CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Glycolic Acid)	3137906: D12	13.5 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			54 x 250 kg drums	UN Number	3265	Pack Group	II	CAS Number	79-14-1		
HYACID1834	HYDROCHLORIC ACID 33%, 20 litre carboys (One-Way) HYDROCHLORIC ACID	3189417: D13	0.2 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			10 x 20 L carboys	UN Number	1789	Pack Group	II	CAS Number	7647-01-0		
HYACID1900	Hydrochloric Acid 33%, 240 kg Drums HYDROCHLORIC ACID	3133034: D11 3153317: D13	18.24 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			76 x 240 kg drums	UN Number	1789	Pack Group	II	CAS Number	7647-01-0		

Dangerous Goods Stock Manifest

Stock by Building

Building D1 / HYPACI2210 to POPEOX9900

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
HYPACI2210	Hypophosphorous Acid 50% Solution CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Hypophosphorous Acid)	2890966E: D14	0.3 tonne 12 x 25 kg carboys	Class UN Number Poison Sch.	8 3264 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 6303-21-5 C	pH	Acid
IODINE1020	Iodine Prill IODINE	3180437: D14	1 tonne 50 x 20 kg drums	Class UN Number Poison Sch.	8 3495 6	Sub. Risk(s) Pack Group Hazchem	6.1 III 2X	Physical State CAS Number	Solid 7553-56-2 Xn, N	pH	Acid
KUAMCO1450	Benzalkonium Chloride 50% Corrosive liquid, Acidic, Organic, N.O.S. (Benzalkonium Chloride, solution, 50%) (Benzalkonium Chloride)	3191520A: D13	6.8 tonne 34 x 200 kg drums	Class UN Number Poison Sch.	8 3265 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 139-07-1 C, N	pH	Acid
LAACID1700	L(+)- Lactic Acid 80% FCC - 250kg CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	L1606020519: D14	0.75 tonne 3 x 250 kg drums	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 50-21-5 C	pH	Conc. Str. Acid
LAACID7800	Lactic Acid 80% 25kg Carboys CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	C15039: D11	0.025 tonne 1 x 25 kg carboys	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 50-21-5 C	pH	Conc. Str. Acid
LAACID9600	Lactic Acid Heatstable FCC 88% CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	L1603010297: D11	0.1 tonne 4 x 25 kg carboys	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 50-21-5 C	pH	Conc. Str. Acid
LUBEAD3210	STURACO 7098 208L Drum CORROSIVE LIQUID, N.O.S. (N-TALLOW-1,3- DIAMINOPROPANE, BIS(2-ETHYLHEXYL) HYDROGEN PHOSPHATE)	201511200071: D13	0.832 KLTR 4 x 208 L drums	Class UN Number Poison Sch.	8 1760 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid Mixture	pH	N/A
MAMEAC2500	XF-322W Maleic Acid Copolymer – drums CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Copolymer Of Maleic Anhydride And Acrylic Acid)	2962396C: D14	1 tonne 4 x 250 kg drums	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 113221-69-5 C	pH	Acid
PHACID0200	Phosphoric Acid 85% Food 330kg PHOSPHORIC ACID, SOLUTION	45CX1602016: D14 (Reject)	0.66 tonne 2 x 330 kg drums	Class UN Number Poison Sch.	8 1805 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2R	Physical State CAS Number	Liquid 7664-38-2 C	pH	Conc. Str. Acid
POPEOX9900	Pot Peroxymono Sulphate CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (Potassium Peroxomonosulfate)	3113427A: D11 3214043: D11	15.75 tonne 630 x 25 kg bags	Class UN Number Poison Sch.	8 3260 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 70693-62-8 C	pH	Acid

Dangerous Goods Stock Manifest

Stock by Building

Building D1 / SOBIFL2000 to ZICHLO1850

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
SOBIFL2000	Sodium Bifluoride	81776: D12	0.06 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	SODIUM HYDROGEN-DIFLUORIDE		3 x 20 kg bags	UN Number Poison Sch.	2439 Not schedule d	Pack Group Hazchem	II 2X	CAS Number	1333-83-1 T, C		
SOLAET6800	SLES 70% 2EO Natural 170kg drums	3132105: D12	0.17 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		1 x 170 kg drums	UN Number Poison Sch.	N/A Not schedule d	Pack Group Hazchem	N/A N/A	CAS Number	68891-38-3 Xi, N		
SUACID2000	Sulphamic Acid	2258552: D11 (Reject), D12 (Reject)	0.085 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	SULPHAMIC ACID		3.4 x 25 kg bags	UN Number Poison Sch.	2967 6	Pack Group Hazchem	III 2X	CAS Number	5329-14-6 Xi		
SUACID2050	Sulphamic Acid	3119994: D13	1.075 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	SULPHAMIC ACID		43 x 25 kg bags	UN Number Poison Sch.	2967 6	Pack Group Hazchem	III 2X	CAS Number	5329-14-6 Xi		
SUACID3500	Sulphamic Acid	3107528: D13	3.7 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	SULPHAMIC ACID		148 x 25 kg bags	UN Number Poison Sch.	2967 6	Pack Group Hazchem	III 2X	CAS Number	5329-14-6 Xi		
SUACID3700	Sulphamic Acid	3227297: D13	0.25 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	SULPHAMIC ACID		10 x 25 kg bags	UN Number Poison Sch.	2967 6	Pack Group Hazchem	III 2X	CAS Number	5329-14-6 Xi		
SUACID9000	Sulphamic Acid - 25kg	3222872: D13	19.8 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	SULPHAMIC ACID		792 x 25 kg bags	UN Number Poison Sch.	2967 6	Pack Group Hazchem	III 2X	CAS Number	5329-14-6 Xi		
ZICHLO1100	Zinc Chloride 98%	3158176: D14	0.95 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Acid
	ZINC CHLORIDE, ANHYDROUS		38 x 25 kg bags	UN Number Poison Sch.	2331 6	Pack Group Hazchem	III 2X	CAS Number	7646-85-7 C, N, Xn		
ZICHLO1850	Zinc Chloride	2932527A: D12	0.05 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Acid
	ZINC CHLORIDE, ANHYDROUS		2 x 25 kg bags	UN Number Poison Sch.	2331 6	Pack Group Hazchem	III 2X	CAS Number	7646-85-7 C, N, Xn		

Dangerous Goods Stock Manifest

Stock by Building

Building D2 / BAMETA2500 to SOSILI1500

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
BAMETA2500	Barium Metaborate BARIUM COMPOUND, N.O.S. (Barium metaborate monohydrate)	3085573: D22	1 tonne 40 x 25 kg bags	Class UN Number Poison Sch.	6.1 1564 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2Z	Physical State CAS Number	Solid 13701-59-2 Xn	pH	Alkali
CAFFEI6200	Caffeine Anhydrous BP/USP ALKALOIDS, SOLID, N.O.S. (Caffeine)	1031601837: D24	0.68 tonne 34 x 20 kg cartons	Class UN Number Poison Sch.	6.1 1544 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 58-08-2 T	pH	N/A
CHMEIS3000	Cmit Min 14% - 250Kg Drums CORROSIVE LIQUID, TOXIC, N.O.S. (5-Chloro-2-methyl-4-isothiazolin-3-one)	3028126B: D23	0.25 tonne 1 x 250 kg drums	Class UN Number Poison Sch.	8 2922 6	Sub. Risk(s) Pack Group Hazchem	6.1 II 2X	Physical State CAS Number	Liquid 26172-55-4 C, N	pH	Acid
DBTOXI1000	Di-N-Butyltinoxide ORGANOTIN COMPOUND, SOLID, N.O.S. (Contains Dibutyltin Oxide)	2844090B: D21 (Reject)	0.05 tonne 2 x 25 kg drums	Class UN Number Poison Sch.	6.1 3146 7	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 818-08-6 T, N, Xi, Muta. 2	pH	N/A
IODINE1020	Iodine Prill IODINE	3013963: D24	0.08 tonne 4 x 20 kg drums	Class UN Number Poison Sch.	8 3495 6	Sub. Risk(s) Pack Group Hazchem	6.1 III 2X	Physical State CAS Number	Solid 7553-56-2 Xn, N	pH	Acid
SOSILI1000	Sodium Silicofluoride SODIUM FLUOROSILICATE	3141851: D24 (Reject)	0.02 tonne 0.8 x 25 kg bags	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1000	Sodium Silicofluoride SODIUM FLUOROSILICATE	3199408: D21 3214387: D22	31 tonne 1240 x 25 kg bags	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1029	Sodium Silicofluoride SODIUM FLUOROSILICATE	3078719: D24 (Reject)	1.8 tonne 72 x 25 kg bags	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1029	Sodium Silicofluoride SODIUM FLUOROSILICATE	3233900: D21	4 tonne 160 x 25 kg bags	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1100	Sodium Silicofluoride SODIUM FLUOROSILICATE	2762159C: D21 (Reject) 2847852: D21 (Reject)	1.902 tonne 1.902 x 1000 kg bulkers	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1100	Sodium Silicofluoride SODIUM FLUOROSILICATE	3141850C: D24	59 tonne 59 x 1000 kg bulkers	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1500	Sodium Silicofluoride SODIUM FLUOROSILICATE	53892A: D22 (Reject)	0.4 tonne 16 x 25 kg bags	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building D2 / THIOUR7501 to TRCHLO1020

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
THIOUR7501	Thiourea Min 99%	L80710: D24	0.025 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	TOXIC SOLID, ORGANIC, N.O.S. (Thiourea)		1 x 25 kg bags	UN Number	2811	Pack Group	III	CAS Number	62-56-6		
TRCHLO1020	Trichloroethylene Superior Grade	3093938: D23	3.92 tonne	Poison Sch.	6	Hazchem	2X		Xn, N		
	TRICHLOROETHYLENE	3155563: D22	14 x 280 kg drums	Class	6.1	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
				UN Number	1710	Pack Group	III	CAS Number	79-01-6		
				Poison Sch.	6	Hazchem	2Z		T, Xi, N, Carc. 2, Muta. 3		

Dangerous Goods Stock Manifest

Stock by Building

Building Default / HEPTAN3080 to LAACID9600

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
HEPTAN3080	Heptane Bulk	3229045: Default	0.01 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	HEPTANES		10 x 1 L bulk	UN Number	1206	Pack Group	II	CAS Number	64742-49-0		
LAACID1700	L(+) Lactic Acid 80% FCC - 250kg	L1606130841: Default	3.75 tonne	Poison Sch.	5	Hazchem	3YE		F, Xn, N		
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)		15 x 250 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
LAACID2800	L(+) Lactic Acid 88% - 1200kg	L1606130842: Default	1.2 tonne	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)		1 x 1200 kg IBCs	Poison Sch.	N/A	Hazchem	2X		C		
LAACID4700	Lactic Acid Heatstable FCC 88%	L1606130840: Default	1.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)		1 x 1200 kg IBCs	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
LAACID9600	Lactic Acid Heatstable FCC 88%	L1606130840: Default	0.05 tonne	Poison Sch.	N/A	Hazchem	2X		C		
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)		2 x 25 kg carboys	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
				UN Number	3265	Pack Group	II	CAS Number	50-21-5		
				Poison Sch.	N/A	Hazchem	2X		C		

Dangerous Goods Stock Manifest

Stock by Building

Building E2 / CASODA1800 to CASODA1800

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

	Description		Quantity								
Code	Proper Shipping Name	Batch(es) / Area(s)	Packs		Hazard Classification						
CASODA1800	Caustic Soda Pearl	140641B: E22 (Reject)	0.175 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str.
	SODIUM HYDROXIDE, SOLID		7 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		Alkali
				Poison Sch.	6	Hazchem	2W		C		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / ACACID2700 to ACRACI9000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACACID2700	Acetic Acid 75% IBCs ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass	Sample: 8LA1 (Sample)	0.0008 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.0008 x 1000 kg IBCs	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
ACACID6200	Acetic Acid 45% - 200kg ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass	C03286: 8LA3 (Sample)	0.001 tonne	Poison Sch.	5	Hazchem	2R	C			
			0.005 x 200 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
ACACID6400	Acetic Acid 45% 1000kg IBC ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass	1999345: LAB (Sample)	0.000001 tonne	UN Number	2790	Pack Group	III	CAS Number	64-19-7		
			0.000001 x 1000 kg IBCs	Poison Sch.	5	Hazchem	2R	C			
ACACID6800	Acetic Acid 99.85% Pails ACETIC ACID, GLACIAL	1887262: 4S1 (Sample) 1998750: LAB (Sample) 2514598: LAB (Sample)	0.002113 KLTR	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
			0.140866 x 15 L pails	UN Number	2789	Pack Group	II	CAS Number	64-19-7		
ACACID7400	Acetic Acid 75% 1000kg IBC (One-way) ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass	C14797: 8LA3 (Sample)	0.0006 tonne	Poison Sch.	6	Hazchem	•2P	C			
			0.0006 x 1000 kg IBCs	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
ACACID8000	Acetic Acid 90% 200kg Drum ACETIC ACID SOLUTION, more than 80% acid, by mass	73030: QPBOX (Sample) 73035: QPBOX (Sample)	0.0002 tonne	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
			0.001 x 200 kg drums	Poison Sch.	6	Hazchem	•2P	C, C			
ACACID9800	Acetic Acid 90% 20 Litre ACETIC ACID SOLUTION, more than 80% acid, by mass	2370216: LAB (Sample)	0.000001 KLTR	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
			0.00005 x 20 L drums	UN Number	2789	Pack Group	II	CAS Number	64-19-7		
ACCARB0601	Picaclean SR CORROSIVE SOLID, BASIC, ORGANIC, N.O.S. (Contains Potassium Hydroxide)	S13892: NS33 (Sample)	0.00045 tonne	Poison Sch.	6	Hazchem	•2P	C, C			
			0.018 x 25 kg bags	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
ACCOPO7000	Acrylic Copolymer XF-3211 CORROSIVE LIQUID, N.O.S. (Acrylic Acid/2-acrylamido-2-methylpropanesulfonic Acid Copolymer)	3211100314: 8LB1 (Sample) 3211110722: NL04 (Sample)	0.0015 tonne	UN Number	3263	Pack Group	II	CAS Number	7440-44-0		
			0.00125 x 1200 kg IBCs	Poison Sch.	N/A	Hazchem	2X	C			
ACRACI9000	Acrylic Acid 99.5% Min ACRYLIC ACID, STABILISED	20141210: NL09 (Sample)	0.0003 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	N/A
			0.0015 x 200 kg drums	UN Number	2218	Pack Group	II	CAS Number	79-10-7		
				Poison Sch.	Not schedule d	Hazchem	•2W	C, N			

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / ACTEPO4000 to BESOTH9900

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACTEPO4000	XF-5000 Acrylic and Maleic Polymers CORROSIVE LIQUID, ACIDIC, ORGANIC N.O.S. (Acrylic Acid/2-Acrylamido-2-methylpropanesulfonic Acid Terpolymer)	5000100919: NL02 (Sample)	0.0002 tonne 0.00016 x 1250 kg IBCs	Class UN Number Poison Sch.	8 3265 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid Xi, C	pH	Conc. Str. Acid
ACTEPO4100	Terpolymer XF-3100 CORROSIVE LIQUID, ACIDIC, ORGANIC N.O.S. (Acrylic Acid/2-Acrylamido-2-methylpropanesulfonic Acid Terpolymer)	3100110814: NL04 (Sample)	0.0001 tonne 0.000476 x 210 kg drums	Class UN Number Poison Sch.	8 3265 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid Xi, C	pH	Conc. Str. Acid
ALGLET1500	Alkyl Glycidyl Ether Alkyl Glycidyl Ether	20120605: LAB (Sample)	0.000111 tonne 0.000616 x 180 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 68609-97-2 Xi, N	pH	Neutral
ALHYDR2400	White Spirits (Low Aromatic) TURPENTINE SUBSTITUTE	2376960: LAB (Sample)	0.000056 KLTR 0.000271 x 206 L drums	Class UN Number Poison Sch.	3 1300 5	Sub. Risk(s) Pack Group Hazchem	N/A III 3Y	Physical State CAS Number	Liquid 64742-82-1 T, N, Carc. 2, Muta. 2	pH	N/A
ALPAST1600	ZQ-6122 Aluminium Paste 325 Mesh ALUMINIUM POWDER, COATED	2514034: 4S1 (Sample)	0.02 tonne 0.8 x 25 kg drums	Class UN Number Poison Sch.	4.1 1309 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 4Z	Physical State CAS Number	Solid 7429-90-5 F, T	pH	N/A
AMAQUE7200	Ammonia Aqueous 25% - 210kg AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia	121087: 8LA2 (Sample)	0.00025 tonne 0.00119 x 210 kg drums	Class UN Number Poison Sch.	8 2672 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2R	Physical State CAS Number	Liquid 1336-21-6 C, N	pH	Alkali
AMAQUI7000	Ammonia Aqueous 23% IBC AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia	149144B: QPBOX1 (Sample)	0.0002 tonne 0.000219 x 910 kg IBCs	Class UN Number Poison Sch.	8 2672 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2R	Physical State CAS Number	Liquid 1336-21-6 C, N	pH	Alkali
AMBIFL1300	Ammonium Bifluoride 98% Min AMMONIUM HYDROGENDIFLUORIDE, SOLID	1868839: NS02 (Sample)	0.0003 tonne 0.012 x 25 kg bags	Class UN Number Poison Sch.	8 1727 7	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 1341-49-7 T+, C	pH	Acid
BEHENT4000	VARISOFT BT 85 Pellets SOLIDS CONTAINING FLAMMABLE LIQUID N.O.S. (contains 2-Propanol)	ST02999707: NS60 (Sample)	0.0006 tonne 0.024 x 25 kg drums	Class UN Number Poison Sch.	4.1 3175 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 1Z	Physical State CAS Number	Solid Xn, N	pH	N/A
BESOTH9900	Benzisothiazolin-3-One CORROSIVE LIQUID, N.O.S. (1,2-BENZISOTHIAZOLINE-3-ONE)	S14325: 8LB2 (Sample)	0.0002 tonne 0.001 x 200 kg drums	Class UN Number Poison Sch.	8 1760 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 2634-33-5 Xi	pH	Acid

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / BIOCID0900 to CACYAN1200

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
BIOCID0900	Biocide Microcheck MZ 9F CORROSIVE LIQUID, TOXIC, N.O.S	S13919: 8LA2 (Sample)	0.0003 tonne 0.0015 x 200 kg drums	Class UN Number Poison Sch.	8 2922 N/A	Sub. Risk(s) Pack Group Hazchem	6.1 II 2XE	Physical State CAS Number	Liquid 55965-84-9 C	pH	Acid
BIOCID5700	Biocide Microcheck MZ 521 CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (5-CHLORO-2-METHYL-4-ISOTHIASOL-3-ONE	S13494: 8LA3 (Sample)	0.0005 tonne 0.0004 x 1250 kg IBCs	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 55965-84-9	pH	Acid
BORONF3000	Amorphous Boron Powder FLAMMABLE SOLID, INORGANIC, N.O.S. (Boron powder)	1869301: LAB (Sample)	0.0001 tonne 0.006666 x 15 kg pails	Class UN Number Poison Sch.	4.1 3178 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 1Z	Physical State CAS Number	Solid 7440-42-8 Xn, F	pH	N/A
BRCHDI3000	BCDMH 20g Tablet OXIDIZING SOLID CORROSIVE N.O.S (Bromochloro-5,5-dimethylimidazolidine-2,4-dione)	101856: 5S1 (Sample)	0.0008 tonne 0.032 x 25 kg drums	Class UN Number Poison Sch.	5.1 3085 6	Sub. Risk(s) Pack Group Hazchem	8 III 1W	Physical State CAS Number	Solid 32718-18-6 C, O, N	pH	Acid
BRFLUI4600	Brake Fluid Dot 4 (XHD 260) 220kg Drums BRAKE FLUID DOT4	26/1/15: NL14 (Sample)	0.0008 tonne 0.003636 x 220 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	8 N/A N/A	Physical State CAS Number	Liquid 143-22-6 Xi	pH	Alkali
BRHYDR1000	2-bromo-4'-hydroxyacetophenone TOXIC SOLID, CORROSIVE, ORGANIC, N.O.S (2-Bromo-4'-hydroxyacetophenone)	20130520: NS48 (Sample)	0.0003 tonne 0.012 x 25 kg drums	Class UN Number Poison Sch.	6.1 2928 N/A	Sub. Risk(s) Pack Group Hazchem	8 II 2X	Physical State CAS Number	Solid 2491-38-5 T	pH	N/A
BUTYTR1000	Monobutyltintrichloride CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S (Monobutyltintrichloride)	133845: 8LA3 (Sample)	0.0001 tonne 0.002 x 50 kg drums	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 1118-46-3 C	pH	N/A
BUTYTR3000	Monobutyltintrichloride CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S (Monobutyltintrichloride)	134104: 8LA3 (Sample)	0.0002 tonne 0.004 x 50 kg drums	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 1118-46-3 C	pH	N/A
CAACID1100	Caprylic Acid CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (CAPRYLIC ACID)	3244148: NL02 (Sample)	0.0028 tonne 0.015555 x 180 kg drums	Class UN Number Poison Sch.	8 3265 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 124-07-2 C	pH	N/A
CACYAN1200	Calcium Cyanamide Granular 1200kg CALCIUM CYANAMIDE with more than 0.1% calcium carbide	023140819: NS11 (Sample)	0.0004 tonne 0.000333 x 1200 kg bulkers	Class UN Number Poison Sch.	4.3 1403 6	Sub. Risk(s) Pack Group Hazchem	N/A III 4W	Physical State CAS Number	Solid 156-62-7 Xn	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / CAHYPO8500 to CASODA1007

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CAHYPO8500	Calcium Hypochlorite 70% Gran	2305435: NS68 (Sample)	0.0036 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	CALCIUM HYPOCHLORITE, HYDRATED	77457: 5S2 (Sample)	0.08 x 45 kg drums	UN Number	2880	Pack Group	II	CAS Number	7778-54-3		
	MIXTURE with not less than 5.5% but not more than 16% water	92299: 5S1 (Sample)		Poison Sch.	6	Hazchem	1W		O, C, N		
CAHYPO8900	Calcium Hypochlorite 70% Gran	1908113: NS08 (Sample)	0.0001 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	CALCIUM HYPOCHLORITE, HYDRATED		0.0025 x 40 kg drums	UN Number	2880	Pack Group	II	CAS Number	7778-54-3		
	MIXTURE with not less than 5.5% but not more than 16% water			Poison Sch.	6	Hazchem	1W		O, C, N		
CAHYPO9400	Calcium Hypochlorite 70%	2148341: NS09 (Sample)	0.1 kg	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	CALCIUM HYPOCHLORITE, HYDRATED		0.01 x 10 kg pails	UN Number	2880	Pack Group	II	CAS Number	7778-54-3		
	MIXTURE with not less than 5.5% but not more than 16% water			Poison Sch.	6	Hazchem	1W		O, C, N		
CAHYPO9401	Calcium Hypochlorite 70% (Pool Ranger)	2148351: NS09 (Sample)	0.1 kg	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	CALCIUM HYPOCHLORITE, HYDRATED		0.01 x 10 kg pails	UN Number	2880	Pack Group	II	CAS Number	7778-54-3		
	MIXTURE with not less than 5.5% but not more than 16% water			Poison Sch.	6	Hazchem	1W		O, C, N		
CANITR2200	Calcium Nitrate Tetrahydrate 25kg	2363580: NS11 (Sample)	0.001 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	CALCIUM NITRATE		0.04 x 25 kg bags	UN Number	1454	Pack Group	III	CAS Number	13477-34-4		
				Poison Sch.	N/A	Hazchem	1Z				
CANITR4700	Calcium Nitrate Tetra 99%	105346: 5S2 (Sample)	0.0008 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	CALCIUM NITRATE	133606B: QPBOX2 (Sample)	0.032 x 25 kg bags	UN Number	1454	Pack Group	III	CAS Number	13477-34-4		
				Poison Sch.	N/A	Hazchem	1Z				
CAPOLI1000	Caustic Potash Liquid	SAMPLE: NL17 (Sample)	0.005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	POTASSIUM HYDROXIDE SOLUTION		0.017857 x 280 kg drums	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
				Poison Sch.	6	Hazchem	2R		C		
CAPOLI3000	Caustic Potash Liquid 1490kg	122756B: QPBOX (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	POTASSIUM HYDROXIDE SOLUTION		0.000134 x 1490 kg IBCs	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
				Poison Sch.	6	Hazchem	2R		C		
CAPOTA1900	Caustic Potash Flake 25kg	100222001: 8SA2 (Sample)	0.0017 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	POTASSIUM HYDROXIDE, SOLID		0.068 x 25 kg bags	UN Number	1813	Pack Group	II	CAS Number	1310-58-3		
				Poison Sch.	N/A	Hazchem	2W		C		
CAPOTA2500	Caustic Potash Pellets 25kg	110915: 8SB1 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	POTASSIUM HYDROXIDE, SOLID		0.02 x 25 kg cartons	UN Number	1813	Pack Group	II	CAS Number	1310-58-3		
				Poison Sch.	N/A	Hazchem	2W		C		
CASODA1007	Caustic Soda 99.0% Min Flake	S14273: 8SB1 (Sample)	0.00015 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE, SOLID		0.006 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2W		C		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / CASODA3500 to CECHLO6000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CASODA3500	Caustic Soda Pearl SODIUM HYDROXIDE, SOLID	71280: 8SB1 (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			0.008 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA3600	Caustic Soda Flake SODIUM HYDROXIDE, SOLID	71332: 8SB1 (Sample)	0.0004 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			0.016 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA5000	Caustic Soda Micropearl SODIUM HYDROXIDE, SOLID	2652127B: LAB (Sample)	0.025 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			1 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA6000	Caustic Soda Micropearl 25 kg Bags SODIUM HYDROXIDE, SOLID	82975: 8SB1 (Sample)	0.00025 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			0.01 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA7700	Caustic Soda Flake 99% SODIUM HYDROXIDE, SOLID	99962: 8SB1 (Sample)	0.0001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			0.004 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CAUSOB1000	Caustic Soda Liquid 50% Bulk SODIUM HYDROXIDE SOLUTION	L119511: 8LA3 (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.2 x 1 kg bulk	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD0100	Caustic Soda/Potassium Hydroxide Blend Returnable IBC Corrosive Liquid, Basic, Inorganic NOS (Sodium hydroxide, Potassium hydroxide)	081015: LAB (Sample)	0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.000675 x 1480 kg IBCs	UN Number	3266	Pack Group	II	CAS Number			
CAUSOI0900	Caustic Soda Liq 48.5% 1510kg SODIUM HYDROXIDE SOLUTION	2204599A: 8LA1 (Sample)	0.00025 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.000165 x 1510 kg IBCs	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOI3301	Caustic Soda Liq 32% IBC SODIUM HYDROXIDE SOLUTION	L112475: 8LB1 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.000378 x 1320 kg IBCs	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CECHLO6000	VARISOFT 300 CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (cetrimonium chloride)	JA22B28675: NS62 (Sample) Y114700291: NS70 (Sample)	0.0015 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
			0.008021 x 187 kg drums	UN Number	3267	Pack Group	II	CAS Number			
				Poison Sch.	Not scheduled	Hazchem	2X		Xn, N		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / CERAMS2000 to DOBENZ1801

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CERAMS2000	Ceramsil - Medium CERAMSIL	C18378: 8SB1 (Sample)	0.001 tonne 0.05 x 20 kg pails	Class UN Number Poison Sch.	8 3253 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid	pH	N/A
CHLORT1000	Chloramine T Trihydrate CORROSIVE SOLID, BASIC,ORGANIC, N.O.S. (Chloramine T trihydrate)	01231: NS33 (Sample)	0.0008 tonne 0.032 x 25 kg drums	Class UN Number Poison Sch.	8 3263 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid	pH	Alkali
DBTDLA1000	Dibutyltindilaurate ORGANOTIN COMPOUND, LIQUID, N.O.S. (Contains Dibutyltindilaurate)	15202613: NL10 (Sample) 15205010/1: 6L1 (Sample) 15205510: 6L1 (Sample) S14388: 6L1 (Sample)	0.00105 tonne 0.042 x 25 kg drums	Class UN Number Poison Sch.	6.1 2788 7	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid	pH	Neutral
DBTOX1000	Di-N-Butyltinoxide ORGANOTIN COMPOUND, SOLID, N.O.S. (Contains Dibutyltin Oxide)	06022310: 6S1 (Sample) S14388: 6S1 (Sample)	0.0001 tonne 0.004 x 25 kg drums	Class UN Number Poison Sch.	6.1 3146 7	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid	pH	N/A
DEMISP8301	Solvent YK-D80 Hydrocarbons, C11-C14, n-alkanes, isoalkanes, cyclics, <2% aromatics	1980395: NL06 (Sample)	0.0008 KLTR 0.004 x 200 L drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid	pH	N/A
DIBRNI4000	DBNPA TOXIC SOLID, ORGANIC, N.O.S. (2,2-Dibromo-3- Nitrilo-Propionamide)	55971F: 6S1 (Sample)	0.00045 tonne 0.018 x 25 kg drums	Class UN Number Poison Sch.	6.1 2811 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid	pH	Acid
DICECH1000	VARISOFT 432 CG FLAMMABLE LIQUID, CORROSIVE, N.O.S. (Isopropanol quaternary ammonium compounds)	JA01724896: NS61 (Sample)	0.001725 tonne 0.009745 x 177 kg drums	Class UN Number Poison Sch.	3 2924 N/A	Sub. Risk(s) Pack Group Hazchem	8 II •3WE	Physical State CAS Number	Liquid	pH	N/A
DIPENT2000	Dipentene 90% DIPENTENE	2111258: LAB (Sample)	0.000044 tonne 0.00022 x 200 kg drums	Class UN Number Poison Sch.	3 2052 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III 3Y	Physical State CAS Number	Liquid	pH	N/A
DIQUPO2000	ABIL QUAT 3272 Diquaternary Polydimethylsiloxane	E515602503: NS70 (Sample)	0.0005 tonne 0.0025 x 200 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid	pH	Alkali
DISOSU7100	REWOPOL SB DO 75 ETHANOL SOLUTION	S0105210150: NS71 (Sample) Y114800397: NS70 (Sample)	0.00045 tonne 0.00225 x 200 kg drums	Class UN Number Poison Sch.	3 1170 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •2Y	Physical State CAS Number	Liquid	pH	N/A
DOBENZ1801	LABS ACID 210kg drums ALKYLSULPHONIC ACIDS, LIQUID with not more than 5% free sulphuric acid	TK130813: 8LB2 (Sample)	0.0045 tonne 0.021428 x 210 kg drums	Class UN Number Poison Sch.	8 2586 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid	pH	Acid

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / DOBENZ6801 to ETGLMH0800

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
DOBENZ6801	L.A.B.S.A min 96% 1100kg IBC ALKYLSULPHONIC ACIDS, LIQUID with not more than 5% free sulphuric acid	J1A140210-8: 8LA1 (Sample)	0.0002 tonne 0.000181 x 1100 kg IBCs	Class UN Number Poison Sch.	8 2586 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 68584-22-5 C, N	pH	Acid
DOPYRR2000	N-Dodecyl-2-Pyrrolidone CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (N-DODECYL-2-PYRROLIDONE)	74892: 8LB1 (Sample)	0.0015 tonne 0.008333 x 180 kg drums	Class UN Number Poison Sch.	8 3267 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 2687-96-9 C, N	pH	Alkali
DRYaid1010	CARSPRAY 300 CARSPRAY300	J014300606: NL05 (Sample) J014902270: NL10 (Sample)	0.0013 tonne 0.007344 x 177 kg drums	Class UN Number Poison Sch.	3 1219 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2YE	Physical State CAS Number	Liquid Mixture F, Xi	pH	N/A
DTPAAC1000	DTPA.5Na CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (Diethylenetriaminepentaacetic acid pentasodium salt, Sodium hydroxide)	62710: 8LB1 (Sample) S13240: 8LB1 (Sample)	0.00155 tonne 0.0062 x 250 kg drums	Class UN Number Poison Sch.	8 3267 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid Various Xi	pH	Alkali
DTPAAC4000	DTPA 5Na 40% CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (Diethylenetriaminepentaacetic acid pentasodium salt, Sodium hydroxide)	1879924: 8LA1 (Sample)	0.0015 tonne 0.006 x 250 kg drums	Class UN Number Poison Sch.	8 3267 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid Various Xi	pH	Alkali
ETACET1100	Ethyl Acetate 99.5% Min ETHYL ACETATE	143344A: QPBOX1 (Sample)	0.0001 tonne 0.000555 x 180 kg drums	Class UN Number Poison Sch.	3 1173 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II •3YE	Physical State CAS Number	Liquid 141-78-6 F, Xi	pH	N/A
ETALCO3000	Ethanol 95 (Bonded) ETHANOL (ETHYL ALCOHOL) or ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	2719517: LAB (Sample) Sample: LAB (Sample)	1.892123 KLTR 9.460615 x 200 L drums	Class UN Number Poison Sch.	3 1170 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid 64-17-5 F	pH	N/A
ETETPR6000	Ethyl 3-Ethoxypropionate FLAMMABLE LIQUID, N.O.S. (Ethyl-3-Ethoxypropionate)	2651930: LAB (Sample) 2758396: LAB (Sample) SAMPLE: LAB (Sample)	0.001022 tonne 0.005241 x 195 kg drums	Class UN Number Poison Sch.	3 1993 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III •3Y	Physical State CAS Number	Liquid 763-69-9	pH	N/A
ETGLBE6938	Ethylene Glycol Monobutyl Ether ETHYL GLYCOL MONOBUTYL ETHER	3160867: LAB (Sample)	0.0002 tonne 0.001111 x 180 kg drums	Class UN Number Poison Sch.	CL N/A 6	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 111-76-2 Xn	pH	N/A
ETGLMH0800	Cellosolve Solvent 907kg IBC CORROSIVE LIQUID, TOXIC, N.O.S (ETHYLENE GLYCOL MONOHEXYL ETHER)	91222: 8LA2 (Sample)	0.4 kg 0.000441 x 907 kg IBCs	Class UN Number Poison Sch.	8 2922 N/A	Sub. Risk(s) Pack Group Hazchem	6.1 II 2XE	Physical State CAS Number	Liquid 112-25-4 C, Xn	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / ETSILI3000 to HEXANE4000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

	Description			Quantity							
Code	Proper Shipping Name	Batch(es) / Area(s)		Packs	Hazard Classification						
ETSIL3000	Ethyl Silicate	82991: QPBOX (Sample)	0.00025 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	TETRAETHYL SILICATE		0.00125 x 200 kg drums	UN Number	1292	Pack Group	III	CAS Number	11099-06-2		
				Poison Sch.	N/A	Hazchem	3Y		Xn		
FASOFT8001	VARISOFT SEA	Y114B00730: NL05 (Sample)	0.00045 tonne	Class	4.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	FLAMMABLE SOLID ORGANIC, N.O.S. (Isopropanol solution)		0.002368 x 190 kg drums	UN Number	1325	Pack Group	III	CAS Number			
				Poison Sch.	N/A	Hazchem	1Z		N		
FERCHL6000	Ferrous Chloride 31-33% Soln	75688: 8LA2 (Sample)	0.0006 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Ferrous Chloride Solution)		0.000428 x 1400 kg IBCs	UN Number	3264	Pack Group	II	CAS Number	7758-94-3		
				Poison Sch.	5	Hazchem	2X		C		
FERSUL9900	Ferric Sulphate Liquid IBC	L133328: 8LA3 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	CORROSIVE LIQUID N.O.S (FERRIC SULPHATE)		0.000316 x 1580 kg IBCs	UN Number	1760	Pack Group	II	CAS Number	10028-22-5		
				Poison Sch.	5	Hazchem	2X		C, Xi		
FORMIC3700	Formic Acid 85% 1200kg IBC	133952: QPBOX1 (Sample)	0.0036 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
	FORMIC ACID with more than 85% acid by mass		0.003 x 1200 kg IBCs	UN Number	1779	Pack Group	II	CAS Number	64-18-6		
				Poison Sch.	5	Hazchem	•2W		C		
GLACIC2510	Glycolic Acid 70% Cosmetic Grade	20151011: NL08 (Sample)	0.00025 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC N.O.S. (GLYPURE HUGH PURITY ACID)		0.001 x 250 kg drums	UN Number	3265	Pack Group	II	CAS Number	79-14-1		
				Poison Sch.	6	Hazchem	2X		C		
GLUTER6000	Glutaraldehyde 50% Industry Gr	13082306: 8LA1 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (GLUTARALDEHYDE 50%)		0.002272 x 220 kg drums	UN Number	3265	Pack Group	II	CAS Number	111-30-8		
				Poison Sch.	6	Hazchem	2X		T, N, C		
GLUTER7000	Glutaraldehyde 50% Ind.Grd IBC	13052003: LAB (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (GLUTARALDEHYDE 50%)	13061201: LAB (Sample)	0.000454 x 1100 kg IBCs	UN Number	3265	Pack Group	II	CAS Number	111-30-8		
				Poison Sch.	6	Hazchem	2X		T, N, C		
GUACAI5200	Cerospray G	601.955: NSF12 (Sample)	0.0004 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Acid
	Gum Acacia (Gum Arabic)		0.016 x 25 kg bags	UN Number	N/A	Pack Group	N/A	CAS Number	9000-01-5		
				Poison Sch.	Not schedule d	Hazchem	N/A				
HEGLYC0600	Hexylene Glycol	136673: QPBOX1 (Sample)	0.0022 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	Hexylene Glycol	154388: LAB (Sample)	0.011282 x 195 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	107-41-5		
				Poison Sch.	Not schedule d	Hazchem	N/A		Xi		
HEXANE4000	Hexane - Drums	2286185: LAB (Sample)	0.001962 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	HEXANES	2312327: LAB (Sample)	0.00981 x 200 L drums	UN Number	1208	Pack Group	II	CAS Number	64742-49-0		
				Poison Sch.	5	Hazchem	3YE		F, Xn, N		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / HYPERO6000 to LAACID2700

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
HYPERO6000	Hydrogen Peroxide 50% 25kg	C04764: QPBOX1 (Sample)	0.0002 tonne	Class	5.1	Sub. Risk(s)	8	Physical State	Liquid	pH	Conc. Str. Acid
	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)		0.008 x 25 kg carboys	UN Number	2014	Pack Group	II	CAS Number	7722-84-1		
HYSULP2500	Hydroxylamine Sulphate 99% Min	20100502: 8SA1 (Sample)	0.0009 tonne	Poison Sch.	6	Hazchem	2P	CAS Number	O, C		
	HYDROXYLAMINE SULPHATE		0.036 x 25 kg bags	UN Number	2865	Pack Group	III	CAS Number	10039-54-0	pH	Acid
IMIDAZ3000	Imidazole	S14229: 8SA2 (Sample)	0.001 tonne	Poison Sch.	Not schedule d	Hazchem	2X	CAS Number	E, N, Xn, Carc. 3		
	CORROSIVE SOLID, BASIC, ORGANIC N.O.S. (IMIDAZOLE)		0.04 x 25 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Neutral
IODINE1000	Iodine ACS - Prilled	107167A: 8SA1 (Sample)	0.0001 tonne	UN Number	3263	Pack Group	III	CAS Number	288-32-4		
	IODINE		0.004 x 25 kg cartons	Poison Sch.	N/A	Hazchem	2X	CAS Number	Xn, C	pH	Acid
IODINE1800	Iodine ACS - Prilled	150864A: 8SA1 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	6.1	Physical State	Solid	pH	Acid
	IODINE		0.01 x 50 kg drums	UN Number	3495	Pack Group	III	CAS Number	7553-56-2		
ISOPAR3901	SK-ISOL G	1926096: LAB (Sample)	0.000027 KLTR	Poison Sch.	6	Hazchem	2X	CAS Number	Xn, N		
	PETROLEUM DISTILLATES, N.O.S. (Naphtha (Petroleum) Hydrotreated Heavy)		0.000135 x 200 L drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
ISOPAR5006	Isopar L	2515251: NL08 (Sample)	0.0005 KLTR	UN Number	1268	Pack Group	III	CAS Number	64742-48-9		
	ISOPAR L		0.0025 x 200 L drums	Poison Sch.	5	Hazchem	3Y	CAS Number	Xn, Carc. 2, Muta. 2		
KEROSE5100	Shellsol 2046 - Drums	SAMPLE: LAB (Sample)	0.000113 KLTR	Class	CL	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	KEROSENE HIGH FLASH POINT		0.000565 x 200 L drums	UN Number	N/A	Pack Group	N/A	CAS Number	64742-81-0		
KUAMCO1450	Benzalkonium Chloride 50%	3008477: LAB (Sample)	0.00005 tonne	Poison Sch.	5	Hazchem	N/A	CAS Number	Xn		
	Corrosive liquid, Acidic, Organic, N.O.S. (Benzalkonium Chloride, solution, 50%) (Benzalkonium Chloride)		0.00025 x 200 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
LAACID2600	L(+) Lactic Acid 88% - 25kg	L091228916: 8LA3 (Sample)	0.0003 tonne	UN Number	3265	Pack Group	II	CAS Number	139-07-1		
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	L1104160468: QPBOX1 (Sample)	0.012 x 25 kg drums	Poison Sch.	6	Hazchem	2X	CAS Number	C, N		
LAACID2700	L(+) Lactic Acid 88% - 250kg	L1104160468: 8LA1 (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)		0.0008 x 250 kg drums	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
				Poison Sch.	N/A	Hazchem	2X	CAS Number	C		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / LAACID2900 to MALEAC1500

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
LAACID2900	L(+) Lactic Acid 88% - 25kg CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	CO2490: 8LA1 (Sample)	0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.04 x 25 kg carboys	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
LAACID4100	DI (-) Lactic Acid 88% CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	L090219103: 8LA2 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.000416 x 1200 kg IBCs	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
LAACID4600	Lactic Acid Heatstable FCC 88% CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	101510A: 8LA2 (Sample) S14775: 8LA1 (Sample)	0.00035 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.0014 x 250 kg drums	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
LAACID5101	Lactic Acid 88% 25kg CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	74148: 8LA1 (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.008 x 25 kg carboys	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
LIHYDR2200	Lithium Hydroxide Mono LITHIUM HYDROXIDE	127582: 8SA2 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			0.02 x 25 kg bags	UN Number	2680	Pack Group	II	CAS Number	1310-66-3		
LIMONE1830	d-Limonene TERPENE HYDROCARBONS, N.O.S. (D-LIMONENE)	12082006: NL01 (Sample)	0.00075 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
			0.004411 x 170 kg drums	UN Number	2319	Pack Group	III	CAS Number	8028-48-6		
LIMONE5800	Limonene-D TERPENE HYDROCARBONS, N.O.S. (D-LIMONENE)	IAAC001730: LAB (Sample)	0.000005 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
			0.000028 x 173 kg drums	UN Number	2319	Pack Group	III	CAS Number	8028-48-6		
MAANH4401	Maleic Anhydride Briquettes MALEIC ANHYDRIDE or MALEIC ANHYDRIDE, MOLTEN	95874A: 8SA1 (Sample)	0.0004 tonne	Class	8	Sub. Risk(s)	N/A	Physical State		pH	N/A
			0.016 x 25 kg bags	UN Number	2215	Pack Group	III	CAS Number	108-31-6		
MAANH6100	Maleic Anhydride - 25kg Bag MALEIC ANHYDRIDE or MALEIC ANHYDRIDE, MOLTEN	74142: 8SA2 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State		pH	N/A
			0.02 x 25 kg bags	UN Number	2215	Pack Group	III	CAS Number	108-31-6		
MALEAC1500	Maleic Acid Powder CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S (MALEIC ACID)	155243: LAB (Sample) PUAS011-T: 8SA1 (Sample)	0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Acid
			0.04 x 25 kg bags	UN Number	3261	Pack Group	III	CAS Number	110-16-7		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / MEACET2015 to NICHLO5501

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity	Hazard Classification							
	Proper Shipping Name		Packs	Class	UN Number	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Neutral
MEACET2015	Methyl Acetate Bulk METHYL ACETATE	2940870: NL08 (Sample)	0.001 tonne 1 x 1 kg bulk	Class UN Number Poison Sch.	3 1231 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid 79-20-9 F, Xi	pH	Neutral
MECHLO8100	Methylene Chloride 99.8% Min DICHLOROMETHANE	133202A: 6S1 (Sample)	0.0005 tonne 0.001851 x 270 kg drums	Class UN Number Poison Sch.	6.1 1593 5	Sub. Risk(s) Pack Group Hazchem	N/A III 2Z	Physical State CAS Number	Liquid 75-09-2 Xn, Carc. 3	pH	N/A
MEETHY5100	Methyl Ethyl Ketoxime (MEKO) METHYL ETHYL KETOXIME	067: NL14 (Sample)	0.00025 tonne 0.001315 x 190 kg drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 96-29-7 Xn	pH	N/A
MEPYRR1100	N-Methylpyrrolidone Dist. N-Methyl-2-Pyrrolidone	20160701106: NL10 (Sample)	0.001 tonne 0.004761 x 210 kg drums	Class UN Number Poison Sch.	CL N/A 6	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 872-50-4 T, Repr. 2	pH	Alkali
MESPSP2500	Methylated Spirits 100% F4 SMS ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	2829765: LAB (Sample)	0.0002 KLTR 0.001 x 200 L drums	Class UN Number Poison Sch.	3 1170 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid 64-17-5 F, Xi	pH	N/A
MESPSP7500	100 F3 SMS (Bonded) ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	SAMPLE: LAB (Sample)	0.756834 KLTR 3.78417 x 200 L drums	Class UN Number Poison Sch.	3 1170 5	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid F	pH	N/A
METHAN3000	Methanol METHANOL	C03093: QPBOX1 (Sample)	0.0001 tonne 0.000625 x 160 kg drums	Class UN Number Poison Sch.	3 1230 6	Sub. Risk(s) Pack Group Hazchem	6.1 II •2WE	Physical State CAS Number	Liquid 67-56-1 F, T	pH	N/A
METHAN3300	Methanol METHANOL	C27510: QPBOX (Sample)	0.0001 tonne 0.000625 x 160 kg drums	Class UN Number Poison Sch.	3 1230 6	Sub. Risk(s) Pack Group Hazchem	6.1 II •2WE	Physical State CAS Number	Liquid 67-56-1 F, T	pH	N/A
MEXYDI2000	Meta Xylene Diamine AMINES, LIQUID, CORROSIVE, N.O.S. (m-XYLENEDIAMINE, 99%)	96446: 8LB2 (Sample)	0.0002 tonne 0.001 x 200 kg drums	Class UN Number Poison Sch.	8 2735 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 1477-55-0 C, Xn	pH	Alkali
MORPHO4000	Morpholine MORPHOLINE	117710: 8LA2 (Sample)	0.0005 tonne 0.0025 x 200 kg drums	Class UN Number Poison Sch.	8 2054 N/A	Sub. Risk(s) Pack Group Hazchem	3 I •2W	Physical State CAS Number	Liquid 110-91-8 C	pH	Alkali
NICHLO5500	Nickel Chloride 25kg TOXIC SOLID, INORGANIC, N.O.S.(Nickelous Chloride, 6-Hydrate)	09100251: NS21 (Sample)	0.0005 tonne 0.02 x 25 kg bags	Class UN Number Poison Sch.	6.1 3288 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 7718-54-9 T	pH	Acid
NICHLO5501	Nickel Chloride 25kg TOXIC SOLID, INORGANIC, N.O.S.(Nickelous Chloride, 6-Hydrate)	09100251: NS27 (Sample)	0.0001 tonne 0.004 x 25 kg bags	Class UN Number Poison Sch.	6.1 3288 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 7718-54-9 T	pH	Acid

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / NICHLS1000 to PHOACI8010

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity	Hazard Classification							
	Proper Shipping Name		Packs								
NICHLS1000	Nickel Chloride 12% Solution	C01071: 6L2 (Sample)	0.0002 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	TOXIC LIQUID, INORGANIC, N.O.S.(Nickelous Chloride 12%)		0.000187 x 1065 kg IBCs	UN Number	3287	Pack Group	III	CAS Number	7791-20-0		
NISODA1000	Nitrate Of Soda	120302: 5S2 (Sample) 58020: 5S2 (Sample)	0.00045 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Neutral
	SODIUM NITRATE		0.018 x 25 kg bags	UN Number	1498	Pack Group	III	CAS Number	7631-99-4		
NISODA5300	Nitrate Of Soda Prilled	103027: 5S3 (Sample)	0.0019 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Neutral
	SODIUM NITRATE		0.0019 x 1000 kg bulkers	UN Number	1498	Pack Group	III	CAS Number	7631-99-4		
NISODA8500	Nitrate Of Soda Prilled	68572A: 5S2 (Sample)	0.0002 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Neutral
	SODIUM NITRATE		0.008 x 25 kg bags	UN Number	1498	Pack Group	III	CAS Number	7631-99-4		
OCPYRR2000	N-Octyl-2-Pyrrolidone	10456956PO: 8LB1 (Sample)	0.002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (contains 1-OCTYL-2-PYRROLIDINONE)		0.011111 x 180 kg drums	UN Number	3267	Pack Group	II	CAS Number	2687-94-7		
OILCEL1000	Celery Seed Oil "A" - 401/3321	100000131223: NSF23 (Sample) 1160012648/10: LAB (Sample)	0.00032 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	Celery seed Oil		0.032 x 10 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	8015-90-5		
OLEBPP1000	Oleoresin Black Pepper 40/20 - 401/603	1160006977/10: NSF22 (Sample)	0.00107 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	Oleoresins - Black Pepper		0.0535 x 20 kg pails	UN Number	N/A	Pack Group	N/A	CAS Number	84929-41-9		
PAFORM4000	Paraformaldehyde 91-93% Prills	S10262: LAB (Sample)	0.0004 tonne	Class	4.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	PARAFORMALDEHYDE		0.016 x 25 kg bags	UN Number	2213	Pack Group	III	CAS Number	30525-89-4		
PHACID0200	Phosphoric Acid 85% Food 330kg	14121201-2: 8LA1 (Sample)	0.0009 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	PHOSPHORIC ACID, SOLUTION		0.002727 x 330 kg drums	UN Number	1805	Pack Group	III	CAS Number	7664-38-2		
PHACID0300	Phosphoric Acid 85% Food 1700kg One-Way IBC	11030501-3: 8LA1 (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	PHOSPHORIC ACID, SOLUTION		0.000117 x 1700 kg IBCs	UN Number	1805	Pack Group	III	CAS Number	7664-38-2		
PHACID8702	Phosphoric Acid 81% FCC 1600kg	14121405-3: 8LA1 (Sample)	0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	PHOSPHORIC ACID, SOLUTION		0.000625 x 1600 kg IBCs	UN Number	1805	Pack Group	III	CAS Number	7664-38-2		
PHOACI8010	Phosphorous Acid 98.5% min	20150626: NS03 (Sample)	0.0004 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	PHOSPHOROUS ACID		0.016 x 25 kg bags	UN Number	2834	Pack Group	III	CAS Number	13598-36-2		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / PHTRME1000 to POPERM8300

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
PHTRME1000	Phenyltrimethylammonium Chloride	APTMA 11010: MEL (Sample)	0.0003 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	TOXIC SOLID, ORGANIC, N.O.S. (Phenyl Trimethyl Ammonium Chloride)	APTMA 11011: MEL (Sample) APTMA 11012: MEL (Sample)	0.012 x 25 kg drums	UN Number Poison Sch.	2811 N/A	Pack Group Hazchem	III 2X	CAS Number	138-24-9 T		
PINOIL1800	Pine Oil 65% Special Grade	1928688: LAB (Sample)	0.000278 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	PINE OIL		0.001544 x 180 kg drums	UN Number Poison Sch.	1272 5	Pack Group Hazchem	III 3Y	CAS Number	8002-09-3 Xi		
POBIFL1800	Potassium Bifluoride 99% Min	120320: 6S1 (Sample)	0.0003 tonne	Class	8	Sub. Risk(s)	6.1	Physical State	Solid	pH	Conc. Str. Acid
	POTASSIUM HYDROGEN DIFLUORIDE, SOLID	120321: 6S1 (Sample)	0.012 x 25 kg bags	UN Number Poison Sch.	1811 7	Pack Group Hazchem	II 2X	CAS Number	7789-29-9 T, C		
POHEBI5000	Polyhexamethylene Biguamide	S0909241401: NS37 (Sample)	0.00005 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	Acid
	POLYHEXAMETHYLENE BIGUANIDE HYDROCHLORIDE		0.00024 x 208 kg drums	UN Number Poison Sch.	N/A Not scheduled	Pack Group Hazchem	N/A N/A	CAS Number	27083-27-8 Xi, N		
PONITR1215	Potassium Nitrate powder with anticake	2326734: 4S1 (Sample)	0.0016 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE	Sample: LAB (Sample)	0.064 x 25 kg bags	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
PONITR1217	Potassium Nitrate 1-3mm Prill	2943813: LAB (Sample)	0.0245 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE		0.98 x 25 kg bags	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
PONITR2900	Potassium Nitrate + Anticake	116498A: 5S2 (Sample)	0.0002 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE		0.008 x 25 kg bags	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
PONITR6700	Potassium Nitrate Prills 25kg	63636B: 5S1 (Sample)	0.0001 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE		0.004 x 25 kg bags	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
PONITR7000	Potassium Nitrate Fine Prill	140727: QPBOX2 (Sample)	0.002 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE	2305630A: 5S1 (Sample)	0.08 x 25 kg bags	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
PONITR7200	Potassium Nitrate Fine Prill	133687A: QPBOX2 (Sample)	0.008 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE		0.006666 x 1200 kg bulkers	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
POPEOX9900	Pot Peroxymono Sulphate	L132435: 8SA1 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (Potassium Peroxomonosulfate)		0.02 x 25 kg bags	UN Number Poison Sch.	3260 6	Pack Group Hazchem	II 2X	CAS Number	70693-62-8 C		
POPERM8300	Pot. Permanganate USP Code C	S14639: 5S1 (Sample)	0.0003 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM PERMANGANATE		0.012 x 25 kg drums	UN Number Poison Sch.	1490 6	Pack Group Hazchem	II 1Y	CAS Number	7722-64-7 O, Xn, N		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / PPGMYR6000 to SOETXA9600

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

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Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
PPGMYR6000	TEGOSOFT PBE	JA02C28888: NS70 (Sample)	0.00025 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	Tegosoft PBE		0.001295 x 193 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	9003-13-8		
PRACID1000	Propionic Acid	02F0102801: 8LA3 (Sample)	0.002 tonne	Poison Sch.	N/A	Hazchem	N/A				
	PROPIONIC ACID		0.01 x 200 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
PRGALL3000	Propyl Gallate EP	PG/02/15: NS12 (Sample)	0.00001 tonne	UN Number	1848	Pack Group	III	CAS Number	79-09-4		
	TOXIC SOLID, ORGANIC, N.O.S. (PROPYL GALLATE)		0.0004 x 25 kg bags	Poison Sch.	6	Hazchem	•2W		Xi, C		
PRGLME9800	Propyleneglycol Monomethyl Ether	153227: LAB (Sample)	0.000005 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	1-METHOXY-2-PROPANOL		0.000026 x 190 kg drums	UN Number	2811	Pack Group	II	CAS Number	121-79-9		
SILWAX4000	ABIL WAX 9801	E516503777: NS70 (Sample)	0.0005 tonne	Poison Sch.	N/A	Hazchem	2XE		T, Xi		
	Abil Wax 9801		0.002777 x 180 kg drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
SOBICH0700	Sodium Bichromate Anh	92365: 6S1 (Sample)	0.00023 tonne	UN Number	3092	Pack Group	III	CAS Number	107-98-2		
	OXIDIZING SOLID, TOXIC, N.O.S.(SODIUM BICHROMATE)		0.0092 x 25 kg bags	Poison Sch.	N/A	Hazchem	•2Y				
SOCHIT8100	Sodium Chlorite 31% w/w Solution IBC	14102015: 8LA1 (Sample)	0.001 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	CHLORITE SOLUTION		0.002777 x 180 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	191044-49-2		
SODIIS2200	SDIC 60% 8-30 Mesh - 50kg Drum	84183A: 5S2 (Sample)	0.00023 tonne	Poison Sch.	Not scheduled	Hazchem	N/A				
	DICHLOROISOCYANURIC ACID, SALTS		0.0008 x 1250 kg IBCs	Class	5.1	Sub. Risk(s)	6.1	Physical State	Solid	pH	Acid
SODIIS9000	SDIC Anhydrous Granular 20-60	64299A: 5S2 (Sample)	0.00025 tonne	UN Number	3087	Pack Group	II	CAS Number	10588-01-9		
	DICHLOROISOCYANURIC ACID, SALTS		0.005 x 50 kg drums	Poison Sch.	6	Hazchem	2W		O, T+, N		
SODIME2000	Sod Dimethyldithiocarbamate	129192: 8LB1 (Sample)	0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
	CAUSTIC ALKALI LIQUID, N.O.S. (Sodium dimethyldithiocarbamate)		0.0008 x 1250 kg IBCs	UN Number	1908	Pack Group	II	CAS Number	7758-19-2		
SOETXA9600	S.E.X. Pellets 850kg Crates	20110610: LAB (Sample)	0.00025 tonne	Poison Sch.	5	Hazchem	2X		T, C, N		
	XANTHATES		0.005882 x 850 kg crates	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
		20110615: LAB (Sample)	0.00084 tonne	UN Number	2465	Pack Group	II	CAS Number	2893-78-9		
			0.0168 x 50 kg drums	Poison Sch.	6	Hazchem	1W		Xn, N, O		
			0.0002 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
			0.000166 x 1200 kg IBCs	UN Number	2465	Pack Group	II	CAS Number	2893-78-9		
				Poison Sch.	6	Hazchem	1W		Xn, N, O		
				Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
				UN Number	1719	Pack Group	II	CAS Number	128-04-1		
				Poison Sch.	Not scheduled	Hazchem	2R		C, N		
				Class	4.2	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
				UN Number	3342	Pack Group	III	CAS Number	140-90-9		
				Poison Sch.	N/A	Hazchem	1Y		Xn		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / SOFLUO1301 to SOLUTB2000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
SOFLUO1301	Sodium Fluoride Powder	93924: 6S1 (Sample)	0.0003 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Neutral
	SODIUM FLUORIDE, SOLID		0.012 x 25 kg bags	UN Number	1690	Pack Group	III	CAS Number	7681-49-4		
SOFLUO2900	Sodium Fluoride 98% Granular	S14725: 6S1 (Sample)	0.0005 tonne	Poison Sch.	6	Hazchem	2Z		T		
	SODIUM FLUORIDE, SOLID		0.02 x 25 kg bags	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Neutral
SOLAET1500	SLES 24-2NS/70	121256E: NL06 (Sample)	0.0002 tonne	UN Number	1690	Pack Group	III	CAS Number	7681-49-4		
	Sodium Lauryl Ether Sulphate		0.002 x 1000 kg IBCs	Poison Sch.	6	Hazchem	2Z		T		
SOLAET1800	SLES 24-2NS/70	121256E: NL06 (Sample)	0.002 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		0.002 x 1000 kg IBCs	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
SOLAET1800	SLES 24-3NS/70	2379: NL20 (Sample)	0.002 tonne	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
	Sodium Lauryl Ether Sulphate		0.020476 x 210 kg drums	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
SOLAET4500	SLES 70% 2EO IBC	8012033007: NL01 (Sample)	0.0043 tonne	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
	Sodium Lauryl Ether Sulphate		0.000727 x 1100 kg IBCs	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
SOLAET4500	SLES 70% 2EO IBC	8012033007: NL01 (Sample)	0.0008 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		0.000727 x 1100 kg IBCs	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
SOLAET4600	SLES 70% 3EO	5011121901: NS03 (Sample)	0.00015 tonne	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
	Sodium Lauryl Ether Sulphate		0.000882 x 170 kg drums	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
SOLAET4600	SLES 70% 3EO	5011121901: NS03 (Sample)	0.00015 tonne	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
	Sodium Lauryl Ether Sulphate		0.000882 x 170 kg drums	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
SOLAET4800	SLES 70% 2EO Natural	109385: NL07 (Sample)	0.0002 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		0.00125 x 160 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
SOLAET4800	SLES 70% 2EO Natural	109385: NL07 (Sample)	0.0002 tonne	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
	Sodium Lauryl Ether Sulphate		0.00125 x 160 kg drums	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
SOLAET8600	SLES 24-3NS/27 Drums	2409: NL20 (Sample)	0.004 tonne	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
	Sodium Lauryl Ether Sulphate		0.019047 x 210 kg drums	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
SOLAET8600	SLES 24-3NS/27 Drums	2409: NL20 (Sample)	0.004 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		0.019047 x 210 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
SOLAET8600	SLES 24-3NS/27 Drums	2409: NL20 (Sample)	0.004 tonne	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
	Sodium Lauryl Ether Sulphate		0.019047 x 210 kg drums	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
SOLAET8600	SLES 24-3NS/27 Drums	2409: NL20 (Sample)	0.004 tonne	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
	Sodium Lauryl Ether Sulphate		0.019047 x 210 kg drums	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
SOLUTB2000	Solution B	C24690: 5L1 (Sample)	0.001 tonne	Class	5.1	Sub. Risk(s)	8	Physical State	Liquid	pH	N/A
	OXIDISING LIQUID, CORROSIVE, N.O.S. (PEROXIDE BLEND)		0.000833 x 1200 kg IBCs	UN Number	3098	Pack Group	II	CAS Number	7722-84-1		
SOLUTB2000	Solution B	C24690: 5L1 (Sample)	0.001 tonne	Poison Sch.	5	Hazchem	2P		O, C		
	OXIDISING LIQUID, CORROSIVE, N.O.S. (PEROXIDE BLEND)		0.000833 x 1200 kg IBCs	Class	5.1	Sub. Risk(s)	8	Physical State	Liquid	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / SOMESI5800 to SOPER6700

Location

Redox Pty Ltd
4 Holmes Road
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Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
SOMESI5800	Sodium Metasilicate Anh Gran DISODIUM TRIOXOSILICATE	106386B: 8SB1 (Sample)	0.00035 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str.
			0.014 x 25 kg bags	UN Number	3253	Pack Group	III	CAS Number	6834-92-0		Alkali
SOMOAC2500	Sod. Monochloro Acetate 98.5% SODIUM CHLOROACETATE	90082: 6S1 (Sample)	0.0008 tonne	Poison Sch.	5	Hazchem	2X		C		
			0.032 x 25 kg bags	UN Number	2659	Pack Group	III	CAS Number	3926-62-3		
SOMOAC3000	Sod Monochloro Acetate SODIUM CHLOROACETATE	92632: 6S1 (Sample)	0.00025 tonne	Poison Sch.	N/A	Hazchem	2Z		T, N, Repr. 2		
			0.0125 x 20 kg bags	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
SOMOAC5000	Sod Monochloro Acetate SODIUM CHLOROACETATE	130681: 6S1 (Sample)	0.0008 tonne	UN Number	2659	Pack Group	III	CAS Number	3926-62-3		
			0.04 x 20 kg bags	Poison Sch.	N/A	Hazchem	2Z		T, N, Repr. 2		
SONITF3000	Sodium Nitrite FCC SODIUM NITRITE	1027537801: 4S1 (Sample)	25 kg	Class	5.1	Sub. Risk(s)	6.1	Physical State	Solid	pH	Alkali
			1 x 25 kg cartons	UN Number	1500	Pack Group	III	CAS Number	7632-00-0		
SONITF3100	Sodium Nitrite FCC SODIUM NITRITE	102879B: 5S1 (Sample)	0.1 kg	Poison Sch.	7	Hazchem	1Z		O, T, N		
			0.004 x 25 kg cartons	Class	5.1	Sub. Risk(s)	6.1	Physical State	Solid	pH	Alkali
SONITR2000	Sodium Nitrite HQ - Technical SODIUM NITRITE	2153654: 5S1 (Sample)	0.0003 tonne	UN Number	1500	Pack Group	III	CAS Number	7632-00-0		
			0.012 x 25 kg bags	Poison Sch.	7	Hazchem	1Z		O, T, N		
SONITR9100	Sodium Nitrite - No Anticaking SODIUM NITRITE	3097601: 4S1 (Sample)	0.05 tonne	Class	5.1	Sub. Risk(s)	6.1	Physical State	Solid	pH	Alkali
			2 x 25 kg bags	UN Number	1500	Pack Group	III	CAS Number	7632-00-0		
SONITR9600	Sodium Nitrite Prilled SODIUM NITRITE	97167: 5S3 (Sample)	0.022 tonne	Poison Sch.	7	Hazchem	1Z		O, T, N		
			0.88 x 25 kg bags	Class	5.1	Sub. Risk(s)	6.1	Physical State	Solid	pH	Alkali
SOPER6400	Sodium Percarbonate Coated SODIUM CARBONATE PEROXYHYDRATE	1877951: 5S1 (Sample)	0.001 tonne	UN Number	3378	Pack Group	II	CAS Number	15630-89-4		
			0.04 x 25 kg bags	Poison Sch.	6	Hazchem	1Y		O, Xn, Xi		
SOPER6460	Sodium Percarbonate Tablet SODIUM CARBONATE PEROXYHYDRATE	41HY14-156: 5S1 (Sample)	0.0006 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
			0.024 x 25 kg cartons	UN Number	3378	Pack Group	II	CAS Number	15630-89-4		
SOPER6500	Sodium Percarbonate Coated SODIUM CARBONATE PEROXYHYDRATE	117691C: 5S2 (Sample)	0.0005 tonne	Poison Sch.	6	Hazchem	1Y		O, Xn, Xi		
			0.000454 x 1100 kg bulkers	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
SOPER6700	Sodium Percarbonate Coated SODIUM CARBONATE PEROXYHYDRATE	124358: 5S1 (Sample) 126420: 5S1 (Sample)	0.0013 tonne	UN Number	3378	Pack Group	II	CAS Number	15630-89-4		
			0.052 x 25 kg bags	Poison Sch.	6	Hazchem	1Y		O, Xn, Xi		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / SOPERM6500 to THDIOX3000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
SOPERM6500	Sodium Perborate Monohydrate	S12857: 5S2 (Sample)	0.001 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	SODIUM PERBORATE MONOHYDRATE		0.04 x 25 kg bags	UN Number	3377	Pack Group	III	CAS Number	10332-33-9		
SOSELA1200	Sodium Selenate Ag Grade	S13893: 6S1 (Sample)	0.0002 tonne	Poison Sch.	N/A	Hazchem	1Z		O, T		
	SELENATES		0.008 x 25 kg drums	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
SOSELC1500	Sil Sel 1% RBP	87265: 6S1 (Sample)	0.00016 tonne	UN Number	2630	Pack Group	I	CAS Number	13410-01-0		
	TOXIC SOLID, INORGANIC, N.O.S. (Contains Sodium Selenite)		0.0064 x 25 kg bags	Poison Sch.	7	Hazchem	2X		T, N		
SOSILI1000	Sodium Silicofluoride	109224: 6S1 (Sample)	0.0003 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	SODIUM FLUOROSILICATE		0.012 x 25 kg bags	UN Number	2674	Pack Group	III	CAS Number	16893-85-9		
SOSILI1100	Sodium Silicofluoride	104824L: 6S1 (Sample) 117576A: 6S1 (Sample)	0.00074 tonne	Poison Sch.	6	Hazchem	2X		T		
	SODIUM FLUOROSILICATE		0.00074 x 1000 kg bulkers	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
SOSILI5000	Sodium Silicofluoride	82303: 6S1 (Sample)	0.00015 tonne	UN Number	2674	Pack Group	III	CAS Number	16893-85-9		
	SODIUM FLUOROSILICATE		0.006 x 25 kg bags	Poison Sch.	6	Hazchem	2X		T		
STAMID1000	Stearamidopropyl Dimethylamine	S0908171731: NS42 (Sample)	0.0004 tonne	Class	9	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. Stearamidopropyl Dimethylamine		0.026666 x 15 kg bags	UN Number	3077	Pack Group	III	CAS Number	7651-02-7		
SUFBIO1000	REWOCID WK 30	ES63A02817: NS70 (Sample)	0.00075 tonne	Poison Sch.	N/A	Hazchem	2Z				
	CORROSIVE LIQUID, N.O.S. (microbicidal amphoteric surfactants)		0.003658 x 205 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
SULACI1917	SULPHURIC ACID 70% 200L Drums	2382143: LAB (Sample)	0.038648 KLTR	UN Number	1760	Pack Group	II	CAS Number	Various		
	SULPHURIC ACID with more than 51% acid		0.19324 x 200 L drums	Poison Sch.	N/A	Hazchem	2X		C, N		
SULPHU0200	Sulphur Ultraventilated Oil1%	100989: 4S1 (Sample) 71800: NS55 (Sample)	0.0015 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	SULPHUR		0.06 x 25 kg bags	UN Number	1830	Pack Group	II	CAS Number	7664-93-9		
SULPHU1400	Rgs Regular Sulphur Pwd 25kg	112936B: LAB (Sample)	0.0001 tonne	Poison Sch.	6	Hazchem	2P		C		
	SULPHUR		0.004 x 25 kg bags	Class	4.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
THDIOX3000	Thiourea Dioxide - 25kg Bags	86604: 4S1 (Sample)	0.00007 tonne	UN Number	1350	Pack Group	III	CAS Number	7704-34-9		
	THIOUREA DIOXIDE		0.0028 x 25 kg bags	Poison Sch.	N/A	Hazchem	1Z		Xi		
				Class	4.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
				UN Number	1350	Pack Group	III	CAS Number	7704-34-9		
				Poison Sch.	N/A	Hazchem	1Z		Xi		
				Class	4.2	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
				UN Number	3341	Pack Group	II	CAS Number	1758-73-2		
				Poison Sch.	6	Hazchem	1Y		Xn, Xi		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / THDIOX4000 to ZICHLO3300

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
THDIOX4000	Thiourea Dioxide 95% Min THIOUREA DIOXIDE	78885: 4S1 (Sample)	0.0001 tonne	Class	4.2	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
			0.004 x 25 kg bags	UN Number	3341	Pack Group	II	CAS Number	1758-73-2		
				Poison Sch.	6	Hazchem	1Y		Xn, Xi		
THDIOX5000	Thiourea Dioxide 90% Min THIOUREA DIOXIDE	78886: 4S1 (Sample)	0.0001 tonne	Class	4.2	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
			0.004 x 25 kg bags	UN Number	3341	Pack Group	II	CAS Number	1758-73-2		
				Poison Sch.	6	Hazchem	1Y		Xn, Xi		
THIOUR7000	Thiourea TOXIC SOLID, ORGANIC, N.O.S. (Thiourea)	133039: 6S1 (Sample)	0.001 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
		136514: 6S1 (Sample)	0.04 x 25 kg bags	UN Number	2811	Pack Group	III	CAS Number	62-56-6		
				Poison Sch.	6	Hazchem	2X		Xn, N		
TRCHIS6501	TCCA-200g Tabs (1kg Soft Inner) TRICHLOROISOCYANURIC ACID, DRY	82298B: 5S2 (Sample)	0.0004 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
			0.008 x 50 kg drums	UN Number	2468	Pack Group	II	CAS Number	87-90-1		
				Poison Sch.	N/A	Hazchem	1W		O, Xn, N		
VAPENT8100	Vanadium Pentoxide Granular VANADIUM PENTOXIDE, non-fused form	78930: 6S1 (Sample)	0.0003 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
			0.001875 x 160 kg drums	UN Number	2862	Pack Group	III	CAS Number	1314-62-1		
				Poison Sch.	N/A	Hazchem	2X		T, N, Muta. 3, Repr. 3		
VITDCA2100	Vitamin D3 500 VITAMIN D3	S14639: NSF04 (Sample)	0.2 kg	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Acid
			0.008 x 25 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	Mixture		
				Poison Sch.	Not schedule d	Hazchem	N/A				
ZICHLO0300	Zinc Chloride 98% Min ZINC CHLORIDE, ANHYDROUS	S14887: 8SA2 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Acid
			0.02 x 25 kg bags	UN Number	2331	Pack Group	III	CAS Number	7646-85-7		
				Poison Sch.	6	Hazchem	2X		C, N, Xn		
ZICHLO2600	Zinc Chloride ZINC CHLORIDE, ANHYDROUS	110547: 8SA1 (Sample)	0.0004 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Acid
			0.016 x 25 kg bags	UN Number	2331	Pack Group	III	CAS Number	7646-85-7		
				Poison Sch.	6	Hazchem	2X		C, N, Xn		
ZICHLO3300	Zinc Chloride Pwd 98.5% Min ZINC CHLORIDE, ANHYDROUS	S14887: 8SA2 (Sample)	0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Acid
			0.04 x 25 kg bags	UN Number	2331	Pack Group	III	CAS Number	7646-85-7		
				Poison Sch.	6	Hazchem	2X		C, N, Xn		

Attachment 2: Redox Girraween (Deltrex) Dangerous Goods Storage

Dangerous Goods Stock Manifest

Stock Summary

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Class	Sub. Risks	Pack Group	Quantity Packaged		Quantity Bulk	
			Weight (kg)	Volume (L)	Weight (kg)	Volume (L)
5.1		II	0.100	0.132		
5.1	6.1	III	3,470.000	5,019.014		
5.1	8	II	4,400.000	5,560.000		
8		II	496,433.868	434,370.286	103,907.000	74,224.989
8		III	449,137.663	400,880.460	78,140.380	54,194.100
8	3	II	18,387.000	28,674.500		
8	5.1	II	1,960.000	1,518.000		
8	Combustible Liquid (CL)	III	4,999.999	5,742.719		
9		III	875.000	266.000		
Combustible Liquid (CL)			1,020.000	957.700		

Dangerous Goods Stock Manifest

Stock by Building

Building Bulk Store / CAUSOB1000 to SULACB5000

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CAUSOB1000	Caustic Soda Liquid 50% Bulk SODIUM HYDROXIDE SOLUTION	3102846: F11-13 (AGT) 3253099D: F11-13 (AGT) 3253099E: F11-13 (AGT) 3253099F: F11-13 (AGT) 3253099G: F11-13 (AGT)	69.214 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			69214 x 1 kg bulk	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2R		C		
CAUSOD1872	Caustic Soda 50% (NSW) Bulk kg SODIUM HYDROXIDE SOLUTION	3253104B: F11-13 (AGT)	3.69 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			3690 x 1 kg bulk	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2R		C		
FECHSO2700	Ferric Chloride 42% Solution FERRIC CHLORIDE SOLUTION	3246260: F17 (AGT) 3246265: F17 (AGT) 3250137: F17 (AGT) 3820363: F17 (AGT) 3820783: F17 (AGT)	57.631 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			57631 x 1 kg bulk	UN Number	2582	Pack Group	III	CAS Number	7705-08-0		
				Poison Sch.	5	Hazchem	2X		C		
PHACID1104	Phosphoric Acid 75% Solution PHOSPHORIC ACID, SOLUTION	3804973: F03 (AGT)	6.23 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			6230 x 1 kg bulk	UN Number	1805	Pack Group	III	CAS Number	7664-38-2		
				Poison Sch.	6	Hazchem	2R		C		
SOHYCL1823	SODIUM HYPOCHLORITE 12.5% BULK HYPOCHLORITE SOLUTION	3816789: F14-15 (AGT)	1.041 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
			1041 x 1 L bulk	UN Number	1791	Pack Group	III	CAS Number			
				Poison Sch.	6	Hazchem	2X		C, N		
SULACB5000	Sulphuric Acid 98% Bulk SULPHURIC ACID with more than 51% acid	3814748: F16 (AGT)	1.623 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			1623 x 1 kg bulk	UN Number	1830	Pack Group	II	CAS Number	7664-93-9		
				Poison Sch.	6	Hazchem	2P		C		

Dangerous Goods Stock Manifest

Stock by Building

Building Default / CAUSOD1857 to NIACID5513

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification							
	Proper Shipping Name		Packs									
CAUSOD1857	Caustic Soda Liquid 50% 1530kg IBC (Returnable)	3803765: Default	1.53 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str.	Alkali
	SODIUM HYDROXIDE SOLUTION		1 x 1530 kg IBCs	UN Number	1824	Pack Group	II	CAS Number	1310-73-2			
FLSIAC1701	Fluorosilicic Acid 27% Bulk	3805848: Default	0.03 tonne	Poison Sch.	6	Hazchem	2R		C			
	FLUOROSILICIC ACID		30 x 1 kg bulk	UN Number	1778	Pack Group	II	CAS Number	16961-83-4			
HYACID1900	Hydrochloric Acid 33%, 240 kg Drums	3010383: Default (Reject)	0.24 tonne	Poison Sch.	7	Hazchem	2X	Physical State	Liquid	pH	Conc. Str.	Acid
	HYDROCHLORIC ACID		1 x 240 kg drums	UN Number	1789	Pack Group	II	CAS Number	7647-01-0			
NIACID5513	Nitric Acid 68%	3820255: Default	1.4 tonne	Poison Sch.	6	Hazchem	2R		C			
	NITRIC ACID other than red fuming, with at least 65% but not more than 70% nitric acid		1 x 1400 kg IBCs	UN Number	2031	Pack Group	II	CAS Number	7697-37-2			
				Poison Sch.	6	Hazchem	2R		O, C			

Dangerous Goods Stock Manifest

Stock by Building

Building Front Warehouse / ACACID1892 to AMAQUI7501

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACACID1892	ACETIC ACID 90% 200kg Drums	3110036B: B	0.037 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
	ACETIC ACID SOLUTION, more than 80% acid, by mass		0.185 x 200 kg drums	UN Number	2789	Pack Group	II	CAS Number	64-19-7		
ACACID1916	Acetic Acid 75% 1000kg Returnable IBC	3814881: B	8 tonne	Poison Sch.	6	Hazchem	•2P		C, C		
	ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass		8 x 1000 kg IBCs	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
ACACID2200	Acetic Acid 25% - Gas 25	3001628: B	1 tonne	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
	ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass		1 x 1000 kg IBCs	Poison Sch.	5	Hazchem	2R		C		
ACACID5801	Acetic Acid 55% solution	3148429: B	2.08 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass		2 x 1040 kg IBCs	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
ACACID6400	Acetic Acid 45% 1000kg IBC	3807098: B 3810733: B	7 tonne	Poison Sch.	5	Hazchem	2R		C		
	ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass		7 x 1000 kg IBCs	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
ACACID7400	Acetic Acid 75% 1000kg IBC (One-way)	3195099: B	3 tonne	UN Number	2790	Pack Group	III	CAS Number	64-19-7		
	ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass		3 x 1000 kg IBCs	Poison Sch.	5	Hazchem	2R		C		
AMAEUE1836	AMMONIA 25%	3237417: E	7.98 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		42 x 190 kg drums	UN Number	2672	Pack Group	III	CAS Number	1336-21-6		
AMAEUE8201	Ammonia Aqueous Pl.Mauser (200Kpa)	3118776B: E	8.19 tonne	Poison Sch.	6	Hazchem	2R		C, N		
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		39 x 210 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
AMAEUE17002	Ammonia Aqueous 23% IBC	3213949: E	24.57 tonne	UN Number	2672	Pack Group	III	CAS Number	1336-21-6		
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		27 x 910 kg IBCs	Poison Sch.	6	Hazchem	2R		C, N		
AMAEUE17501	Ammonia Aqueous 24% Full Metal	3091376B: E	0.91 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		1 x 910 kg IBCs	UN Number	2672	Pack Group	III	CAS Number	1336-21-6		
				Poison Sch.	6	Hazchem	2R		C, N		

Dangerous Goods Stock Manifest

Stock by Building

Building Front Warehouse / CAPOTA1805 to CAUSOD1852

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
CAPOTA1805	POTASSIUM HYDROXIDE 48% 200L Drum	3059964: E	0.6 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	POTASSIUM HYDROXIDE SOLUTION		3 x 200 L drums	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
CAPOTA1807	POTASSIUM HYDROXIDE 48% 300kg Drum	3166717: E	0.3 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	POTASSIUM HYDROXIDE SOLUTION		1 x 300 kg drums	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
CAPOTA1808	POTASSIUM HYDROXIDE 48% 1000kg IBC	3150157: E	1 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	POTASSIUM HYDROXIDE SOLUTION		1 x 1000 kg IBCs	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
CAPOTA1822	POTASSIUM HYDROXIDE 20% 200L Drums	3131122: E 3214908: E	2.8 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	POTASSIUM HYDROXIDE SOLUTION		14 x 200 L drums	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
CAPOTA1901	Caustic Potash Flake 1000kg	20160906: E	2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	POTASSIUM HYDROXIDE, SOLID		2 x 1000 kg bulkers	UN Number	1813	Pack Group	II	CAS Number	1310-58-3		
CASODA5300	Caustic Soda Micropearl 1000Kg	151558B: E (Reject)	1 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE, SOLID		1 x 1000 kg bulkers	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA5301	Caustic Soda Micropearl 1000Kg	2754878: E (Reject)	0.725 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE, SOLID		0.725 x 1000 kg bulkers	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CAUSOD1700	Caustic Soda Liquid 50% 1500kg IBC (One-Way)	3190689B: E	9 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE SOLUTION		6 x 1500 kg IBCs	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD1839	Caustic Soda Liquid 30% 20L Carboys	3197344: E	0.2 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE SOLUTION		10 x 20 L carboys	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD1841	Caustic Soda Liquid 30% 200L Drums	3233015: E	3.2 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE SOLUTION		16 x 200 L drums	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD1852	Caustic Soda Liquid 50% 20L Carboys	3812239: E	1.48 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE SOLUTION		74 x 20 L carboys	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		

Dangerous Goods Stock Manifest

Stock by Building

Building Front Warehouse / CAUSOD1854 to SOCHIT1824

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
CAUSOD1854	Caustic Soda Liquid 50% 200L Drums SODIUM HYDROXIDE SOLUTION	3218365: E	1.8 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			9 x 200 L drums	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD1914	Caustic Soda Liquid 50% 300kg Drums SODIUM HYDROXIDE SOLUTION	3091032: E 3198399: E	5.4 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			18 x 300 kg drums	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD8901	Caustic Soda Liquid 10% 220kg Mausers SODIUM HYDROXIDE SOLUTION	3209139: E 3814537: E	18.26 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			83 x 220 kg drums	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
FORMIC1832	Formic Acid 10% 1000kg Returnable IBCs FORMIC ACID with not less than 5% but less than 10% acid by mass	3814573: B	6 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
			6 x 1000 kg IBCs	UN Number	3412	Pack Group	III	CAS Number	64-18-6		
HYACIB9602	Hydrochloric Acid 35% IBC HYDROCHLORIC ACID	3156251: B	9.12 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			8 x 1140 kg IBCs	UN Number	1789	Pack Group	II	CAS Number	7647-01-0		
PHACID0900	Phosphoric Acid 85% FCC 1700kg One-Way IBC PHOSPHORIC ACID, SOLUTION	45CX1607045: B	28.9 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			17 x 1700 kg IBCs	UN Number	1805	Pack Group	III	CAS Number	7664-38-2		
PHACID8705	Phosphoric Acid 81% FCC 1650Kg PHOSPHORIC ACID, SOLUTION	45CX1607045: B	21.45 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			13 x 1650 kg IBCs	UN Number	1805	Pack Group	III	CAS Number	7664-38-2		
SOCHIT1811	SODIUM CHLORITE 7.5% 20L Carboys CHLORITE SOLUTION	3102092: E	120 L	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			6 x 20 L carboys	UN Number	1908	Pack Group	III	CAS Number	7758-19-2		
SOCHIT1815	SODIUM CHLORITE 31% 20L Carboys CHLORITE SOLUTION	3186158: E 3238609: E	680 L	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			34 x 20 L carboys	UN Number	1908	Pack Group	II	CAS Number	7758-19-2		
SOCHIT1824	SODIUM CHLORITE 25% CHLORITE SOLUTION	20160801: E	22.5 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			18 x 1250 kg IBCs	UN Number	1908	Pack Group	II	CAS Number	7758-19-2		

Dangerous Goods Stock Manifest

Stock by Building

Building Front Warehouse / SOCHIT1827 to
SULACI1817

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
SOCHIT1827	Sodium Chlorite 31% w/w solution 1250kg IBC CHLORITE SOLUTION	20160719: E 20160815: E	53.75 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			43 x 1250 kg IBCs	UN Number	1908	Pack Group	II	CAS Number	7758-19-2		
SOHYCL1812	SODIUM HYPOCHLORITE 12.5% one-way IBC HYPOCHLORITE SOLUTION	3198992: E	1 KLTR	Poison Sch.	5	Hazchem	2X		T, C, N		
			1 x 1000 L IBCs	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
SOHYCL1832	SODIUM HYPOCHLORITE 12.5% 200L Drums Non Returnable HYPOCHLORITE SOLUTION	3240674: E 3258718: E	4.4 KLTR	UN Number	1791	Pack Group	III	CAS Number			
			22 x 200 L drums	Poison Sch.	6	Hazchem	2X		C, N		
SOHYCL1832	SODIUM HYPOCHLORITE 12.5% 200L Drums Non Returnable HYPOCHLORITE SOLUTION	3069016: E (Reject)	0.2 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
			1 x 200 L drums	UN Number	1791	Pack Group	III	CAS Number			
SOHYCL1838	SODIUM HYPOCHLORITE 12.5% 20L Non Returnable Carboys HYPOCHLORITE SOLUTION	3179096: E	0.64 KLTR	Poison Sch.	6	Hazchem	2X		C, N		
			32 x 20 L carboys	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
SOHYCL1861	SODIUM HYPOCHLORITE 12.5% 200L Drums Non Returnable HYPOCHLORITE SOLUTION	3812381: E	4.8 KLTR	UN Number	1791	Pack Group	III	CAS Number			
			24 x 200 L drums	Poison Sch.	6	Hazchem	2X		C, N		
SUACID1900	Sulphamic Acid Ind 500kg bulkers SULPHAMIC ACID	3166010: B	4 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
			8 x 500 kg bulkers	UN Number	2967	Pack Group	III	CAS Number	5329-14-6		
SUACID1900	Sulphamic Acid Ind 500kg bulkers SULPHAMIC ACID	3166010: B	32 tonne	Poison Sch.	6	Hazchem	2X		Xi		
			64 x 500 kg bulkers	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
SUACID2050	Sulphamic Acid SULPHAMIC ACID	3179583: B	0.5 tonne	UN Number	2967	Pack Group	III	CAS Number	5329-14-6		
			20 x 25 kg bags	Poison Sch.	6	Hazchem	2X		Xi		
SUACID9000	Sulphamic Acid - 25kg SULPHAMIC ACID	2993627: B 3222872: E	1.45 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
			58 x 25 kg bags	UN Number	2967	Pack Group	III	CAS Number	5329-14-6		
SULACI1705	Sulphuric Acid 5% v/v returnable IBC SULPHURIC ACID with not more than 51% acid	3192469: B 3212431: B	3 KLTR	Poison Sch.	6	Hazchem	2X		Xi		
			3 x 1000 L IBCs	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
SULACI1817	SULPHURIC ACID 34.5% 200L Drums SULPHURIC ACID with not more than 51% acid	3170870: B 3198025: B	1.8 KLTR	UN Number	2796	Pack Group	II	CAS Number	7664-93-9		
			9 x 200 L drums	Poison Sch.	6	Hazchem	2R		C		
				Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
				UN Number	2796	Pack Group	II	CAS Number	7664-93-9		
				Poison Sch.	6	Hazchem	2R		C		

Dangerous Goods Stock Manifest

Stock by Building

Building Front Warehouse / SULACI1832 to ZISULP1809

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
SULACI1832	SULPHURIC ACID 98% 10L Carboy SULPHURIC ACID with more than 51% acid	3188758: B 3233945: B	0.12 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			12 x 10 L carboys	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1851	Sulphuric Acid 50% 1000L Returnable IBC SULPHURIC ACID with not more than 51% acid	3238028: B 3815963: B	4 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			4 x 1000 L IBCs	UN Number Poison Sch.	2796 6	Pack Group Hazchem	II 2R	CAS Number	7664-93-9 C		
SULACI1854	SULPHURIC ACID 60% 200L DRUMS SULPHURIC ACID with more than 51% acid	3247746: B	0.4 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 200 L drums	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1855	SULPHURIC ACID 60% 1000L One-Way IBC SULPHURIC ACID with more than 51% acid	3193003: B 3194721: B	4 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			4 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1917	SULPHURIC ACID 70% 200L Drums SULPHURIC ACID with more than 51% acid	3171792: B	1.2 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			6 x 200 L drums	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1959	SULPHURIC ACID 60% 1000L Returnable IBC SULPHURIC ACID with more than 51% acid	3101219: B	2 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1993	SULPHURIC ACID 70% 1000L 1-way IBC SULPHURIC ACID with more than 51% acid	3248310: B 3253465: B	8.405 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			8.405 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI4203	Sulphuric Acid 60% 1500kg IBC (Cust. INTEG SA 60) SULPHURIC ACID with more than 51% acid	3241345: B	4.5 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			3 x 1500 kg IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
TRETAM1836	TRIETHANOLAMINE 50% 1020kg Returnable IBC Triethanolamine 50%	3244460: E	1.02 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
			1 x 1020 kg IBCs	UN Number Poison Sch.	N/A 5	Pack Group Hazchem	N/A N/A	CAS Number	Mixture Xn		
URPHOS4000	Urea Phosphate 40% w/w Solution CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.(Contains 25% Phosphoric Acid)	3248748: B	10.71 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			9 x 1190 kg IBCs	UN Number Poison Sch.	3264 5	Pack Group Hazchem	III 2X	CAS Number	4861-19-2 C		
ZISULP1809	ZINC SULPHATE MONO PWD ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc Sulphate)	712414 : E	0.875 tonne	Class	9	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
			35 x 25 kg bags	UN Number Poison Sch.	3077 6	Pack Group Hazchem	III 2Z	CAS Number	7446-19-7 Xn, N		

Dangerous Goods Stock Manifest

Stock by Building

Building Mid Warehouse / ACACID1863 to CAUSOD1856

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACACID1863	ACETIC ACID GLACIAL 200kg Drums	2929656D: F	10.88 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
	ACETIC ACID, GLACIAL	3011772B: F 3166120B: T	54.4 x 200 kg drums	UN Number	2789	Pack Group	II	CAS Number	64-19-7		
AMAEUE5521	Ammonia Aqueous	3202946B: D	8.46 tonne	Poison Sch.	6	Hazchem	•2P		C		
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		423 x 20 kg pails	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
AMAQUI7501	Ammonia Aqueous 24% Full Metal	3202946A: D	9.1 tonne	UN Number	2672	Pack Group	III	CAS Number	1336-21-6		
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		10 x 910 kg IBCs	Poison Sch.	6	Hazchem	2R		C, N		
CAPOTA1808	POTASSIUM HYDROXIDE 48% 1000kg IBC	3150157: D	8 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	POTASSIUM HYDROXIDE SOLUTION	3206017: D	8 x 1000 kg IBCs	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
CAPOTA1809	POTASSIUM HYDROXIDE 48% 1000L IBC	3248336: D	12 KLTR	Poison Sch.	6	Hazchem	2R		C		
	POTASSIUM HYDROXIDE SOLUTION	3815627: D	12 x 1000 L IBCs	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
CAUSOD1823	Caustic Soda Liquid 46% 1000L IBC (Returnable)	3159825: D	12 KLTR	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
	SODIUM HYDROXIDE SOLUTION	3248772: D	12 x 1000 L IBCs	Poison Sch.	6	Hazchem	2R		C		
CAUSOD1831	Caustic Soda Liquid 25% Bulk (kg)	3811255: F	17.86 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE SOLUTION		17860 x 1 kg bulk	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD1831	Caustic Soda Liquid 25% Bulk (kg)	2121849: D (Reject)	1 tonne	Poison Sch.	6	Hazchem	2R		C		
	SODIUM HYDROXIDE SOLUTION		1000 x 1 kg bulk	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
CAUSOD1842	Caustic Soda Liquid 30% 1000L IBC (Returnable)	3227022: D	1 KLTR	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
	SODIUM HYDROXIDE SOLUTION		1 x 1000 L IBCs	Poison Sch.	6	Hazchem	2R		C		
CAUSOD1843	Caustic Soda Liquid 30% 1000L IBC (One-Way)	3211417: D	1 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE SOLUTION		1 x 1000 L IBCs	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD1856	Caustic Soda Liquid 50% 1000L IBC (Returnable)	3817216: D	14 KLTR	Poison Sch.	6	Hazchem	2R		C		
	SODIUM HYDROXIDE SOLUTION		14 x 1000 L IBCs	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
				UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2R		C		

Dangerous Goods Stock Manifest

Stock by Building

Building Mid Warehouse / CAUSOD1856 to GASOLN2010

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CAUSOD1856	Caustic Soda Liquid 50% 1000L IBC (Returnable) SODIUM HYDROXIDE SOLUTION	2929495: D (Reject)	0.3 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.3 x 1000 L IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOD1857	Caustic Soda Liquid 50% 1530kg IBC (Returnable) SODIUM HYDROXIDE SOLUTION	2730351: D (Reject)	1.072 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.700653 x 1530 kg IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOD1857	Caustic Soda Liquid 50% 1530kg IBC (Returnable) SODIUM HYDROXIDE SOLUTION	3247229: D 3809701: D	18.36 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			12 x 1530 kg IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOD1894	Caustic Soda Liquid 25% 1000L IBC (Returnable) SODIUM HYDROXIDE SOLUTION	3182190: D	3 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			3 x 1000 L IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOD1912	Caustic Soda Liquid 50% 1530kg IBC (One-Way) SODIUM HYDROXIDE SOLUTION	3814749: D	9.18 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			6 x 1530 kg IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOD1915	Caustic Soda Liquid 30% 800L IBC (Returnable - Nylex) SODIUM HYDROXIDE SOLUTION	3247239: D	0.8 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			1 x 800 L IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOI2001	Caustic Soda Liquid 20% 1220kg IBC (One-Way) SODIUM HYDROXIDE SOLUTION	3115527: D	2.44 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			2 x 1220 kg IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
FECHSO2505	Ferric Chloride 42% Solution FERRIC CHLORIDE SOLUTION	3225325: C	12.6 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			9 x 1400 kg IBCs	UN Number Poison Sch.	2582 5	Pack Group Hazchem	III 2X	CAS Number	7705-08-0 C		
FLSIAC1700	Fluorosilicic Acid 27% One-way IBCs FLUOROSILICIC ACID	3199396B: C	3.75 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			3 x 1250 kg IBCs	UN Number Poison Sch.	1778 7	Pack Group Hazchem	II 2X	CAS Number	16961-83-4 C		
FORMIC3700	Formic Acid 85% 1200kg IBC FORMIC ACID with more than 85% acid by mass	3148507B: T	1.47 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
			1.225 x 1200 kg IBCs	UN Number Poison Sch.	1779 5	Pack Group Hazchem	II ●2W	CAS Number	64-18-6 C		
GASOLN2010	Gassing Solution OXIDIZING LIQUID, TOXIC, N.O.S. (SODIUM THIOCYANATE AND SODIUM NITRITE)	3170883: T	0.39 tonne	Class	5.1	Sub. Risk(s)	6.1	Physical State	Liquid	pH	Neutral
			0.356164 x 1095 kg IBCs	UN Number Poison Sch.	3099 6	Pack Group Hazchem	III 2W	CAS Number	T, N, O		

Dangerous Goods Stock Manifest

Stock by Building

Building Mid Warehouse / HYPERT6200 to TOLYLI1200

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
HYPERT6200	Hydrogen Peroxide 50% - 1100kg HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)	16073331: T 16082350: T	4.4 tonne 4 x 1100 kg IBCs	Class UN Number Poison Sch.	5.1 2014 6	Sub. Risk(s) Pack Group Hazchem	8 II 2P	Physical State CAS Number	Liquid 7722-84-1 O, C	pH	Conc. Str. Acid
SOHYCL1812	SODIUM HYPOCHLORITE 12.5% one-way IBC HYPOCHLORITE SOLUTION	3239772: D 3252005: D	6 KLTR 6 x 1000 L IBCs	Class UN Number Poison Sch.	8 1791 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid C, N	pH	Alkali
SOHYCL1812	SODIUM HYPOCHLORITE 12.5% one-way IBC HYPOCHLORITE SOLUTION	2964331: D (Reject)	2 KLTR 2 x 1000 L IBCs	Class UN Number Poison Sch.	8 1791 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid C, N	pH	Alkali
SOHYCL1813	Sodium Hypochlorite 12.5% 1000L Returnable IBC HYPOCHLORITE SOLUTION	2599840: D (Reject) 3050784: D (Reject)	3 KLTR 3 x 1000 L IBCs	Class UN Number Poison Sch.	8 1791 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid C, N	pH	Alkali
SOHYCL1813	Sodium Hypochlorite 12.5% 1000L Returnable IBC HYPOCHLORITE SOLUTION	3812289: D 3814151: D 3819303: D	26 KLTR 26 x 1000 L IBCs	Class UN Number Poison Sch.	8 1791 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid C, N	pH	Alkali
SOHYCL1832	SODIUM HYPOCHLORITE 12.5% 200L Drums Non Returnable HYPOCHLORITE SOLUTION	2355783: D (Reject) 3104924: D (Reject)	2.6 KLTR 13 x 200 L drums	Class UN Number Poison Sch.	8 1791 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid C, N	pH	Alkali
SONITL1803	SODIUM NITRITE 40% w/w OXIDIZING LIQUID, TOXIC, N.O.S. (Sodium Nitrite 40% Solution)	936932: T (Reject)	600 L 3 x 200 L drums	Class UN Number Poison Sch.	5.1 3099 6	Sub. Risk(s) Pack Group Hazchem	6.1 III 2W	Physical State CAS Number	Liquid 7632-00-0 T, O, N	pH	Alkali
SONITR9100	Sodium Nitrite - No Anticaking SODIUM NITRITE	3097601: T	2.3 tonne 92 x 25 kg bags	Class UN Number Poison Sch.	5.1 1500 7	Sub. Risk(s) Pack Group Hazchem	6.1 III 1Z	Physical State CAS Number	Solid 7632-00-0 O, T, N	pH	Alkali
TOLYLI1200	Tolyltriazole 50% Sodium Salt CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (Tolyltriazole, Sodium Salt)	2687800: D (Reject)	2.399999 tonne 1.999999 x 1200 kg IBCs	Class UN Number Poison Sch.	8 3267 N/A	Sub. Risk(s) Pack Group Hazchem	CL III 2X	Physical State CAS Number	Liquid 64665-57-2 C, Xn	pH	Alkali

Dangerous Goods Stock Manifest

Stock by Building

Building Rear Warehouse / ACACID1830 to
GLUTER4501

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACACID1830	ACETIC ACID 45% 25kg Carboys	3139742: G	0.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass		8 x 25 kg carboys	UN Number	2790	Pack Group	III	CAS Number	64-19-7		
ACACID1831	ACETIC ACID 20% 200kg Drums	2955808: G	1.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass		6 x 200 kg drums	UN Number	2790	Pack Group	III	CAS Number	64-19-7		
ACACID1863	ACETIC ACID GLACIAL 200kg Drums	3166120A: G	6 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
	ACETIC ACID, GLACIAL	3166120B: G	30 x 200 kg drums	UN Number	2789	Pack Group	II	CAS Number	64-19-7		
ACACID7500	Acetic Acid 75% - Blue Drums	3031110: G	17.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass	3218784B: G	86 x 200 kg drums	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
FECHLO1812	FERRIC CHLORIDE 42% 290KG Drums	945071: G	0.87 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	FERRIC CHLORIDE SOLUTION		3 x 290 kg drums	UN Number	2582	Pack Group	III	CAS Number	7705-08-0		
FECHSO2505	Ferric Chloride 42% Solution	3222690: G	123.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	FERRIC CHLORIDE SOLUTION	3225287: G 3233825: G	88 x 1400 kg IBCs	UN Number	2582	Pack Group	III	CAS Number	7705-08-0		
FECHSO2700	Ferric Chloride 42% Solution	2738242: G (Reject)	13.051 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	FERRIC CHLORIDE SOLUTION	3117535: G (Reject)	13051 x 1 kg bulk	UN Number	2582	Pack Group	III	CAS Number	7705-08-0		
FORMAL1100	Formaldehyde 37/7 IBC	2576412: G (Reject)	2.2 tonne	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
	FORMALDEHYDE SOLUTION with not less than 25% formaldehyde		2 x 1100 kg IBCs	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
FORMAL1817	Formalin 37/7 1000kg IBC	2195809: G (Reject)	0.4 tonne	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
	FORMALDEHYDE SOLUTION with not less than 25% formaldehyde		0.4 x 1000 kg IBCs	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
GLUTER4500	Glutaraldehyde 50%	3132437A: G	2.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (GLUTARALDEHYDE 50%)		2 x 1100 kg IBCs	UN Number	3265	Pack Group	II	CAS Number	111-30-8		
GLUTER4501	Glutaraldehyde 50%	3132437B: G	2.64 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (GLUTARALDEHYDE 50%)		12 x 220 kg drums	UN Number	3265	Pack Group	II	CAS Number	111-30-8		

Dangerous Goods Stock Manifest

Stock by Building

Building Rear Warehouse / HYACIB1900 to PHACID0900

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
HYACIB1900	Hydrochloric Acid 33% 1170Kg IBC (One-Way) HYDROCHLORIC ACID	2977952: G 3164021: G 3211943: G	62.01 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			53 x 1170 kg IBCs	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C		
HYACIB1900	Hydrochloric Acid 33% 1170Kg IBC (One-Way) HYDROCHLORIC ACID	3211943: G (Reject)	16.38 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			14 x 1170 kg IBCs	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C		
HYACIB2500	Hydrochloric Acid 33% HYDROCHLORIC ACID	3066165: G (Reject)	3.48 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			3 x 1160 kg IBCs	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C		
HYACIB9602	Hydrochloric Acid 35% IBC HYDROCHLORIC ACID	3200990: G	45.6 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			40 x 1140 kg IBCs	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C		
HYACID1847	HYDROCHLORIC ACID 9% 20L Carboys HYDROCHLORIC ACID	3024610: G	0.04 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 20 L carboys	UN Number Poison Sch.	1789 5	Pack Group Hazchem	III 2R	CAS Number	7647-01-0 C		
HYACID1900	Hydrochloric Acid 33%, 240 kg Drums HYDROCHLORIC ACID	3010383: G (Reject)	0.24 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			1 x 240 kg drums	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C		
NIACID6500	Nitric Acid 68% 280kg NITRIC ACID other than red fuming, with at least 65% but not more than 70% nitric acid	3009673: G (Reject)	0.28 tonne	Class	8	Sub. Risk(s)	5.1	Physical State	Liquid	pH	Acid
			1 x 280 kg drums	UN Number Poison Sch.	2031 6	Pack Group Hazchem	II 2R	CAS Number	7697-37-2 O, C		
PHACID0100	Phosphoric Acid 85% Food 35kg Carboys PHOSPHORIC ACID, SOLUTION	45CX1510050: G 45CX1605029: G	8.54 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			244 x 35 kg carboys	UN Number Poison Sch.	1805 6	Pack Group Hazchem	III 2R	CAS Number	7664-38-2 C		
PHACID0900	Phosphoric Acid 85% FCC 1700kg One-Way IBC PHOSPHORIC ACID, SOLUTION	45CX1606040: G	3.4 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 1700 kg IBCs	UN Number Poison Sch.	1805 6	Pack Group Hazchem	III 2R	CAS Number	7664-38-2 C		
PHACID0900	Phosphoric Acid 85% FCC 1700kg One-Way IBC PHOSPHORIC ACID, SOLUTION	45CX1606040: G	1.7 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			1 x 1700 kg IBCs	UN Number Poison Sch.	1805 6	Pack Group Hazchem	III 2R	CAS Number	7664-38-2 C		

Dangerous Goods Stock Manifest

Stock by Building

Building Rear Warehouse / PHACID8602 to
SULACI1842

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
PHACID8602	Phosphoric Acid 75% Food 1550kg PHOSPHORIC ACID, SOLUTION	45CX1604028: G	55.8 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			36 x 1550 kg IBCs	UN Number Poison Sch.	1805 6	Pack Group Hazchem	III 2R	CAS Number	7664-38-2 C		
PHACID8705	Phosphoric Acid 81% FCC 1650Kg PHOSPHORIC ACID, SOLUTION	45CX1605032: G	3.3 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 1650 kg IBCs	UN Number Poison Sch.	1805 6	Pack Group Hazchem	III 2R	CAS Number	7664-38-2 C		
SULACB5000	Sulphuric Acid 98% Bulk SULPHURIC ACID with more than 51% acid	L151094: G (Reject)	0.49 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			490 x 1 kg bulk	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1743	SULPHURIC ACID 98% 1000L Nylex Returnable IBC SULPHURIC ACID with more than 51% acid	3817242: G	3 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			3 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1835	SULPHURIC ACID 98% 200L Drums SULPHURIC ACID with more than 51% acid	3236720: G	2.8 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			14 x 200 L drums	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1842	SULPHURIC ACID 98% 1000L One-way IBCs SULPHURIC ACID with more than 51% acid	3817305: G	5 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			5 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1842	SULPHURIC ACID 98% 1000L One-way IBCs SULPHURIC ACID with more than 51% acid	2899618: G (Reject)	0.186 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.186 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		

Dangerous Goods Stock Manifest

Stock by Building

Building Sample / CAUSOD1843 to SULACI1917

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CAUSOD1843	Caustic Soda Liquid 30% 1000L IBC (One-Way) SODIUM HYDROXIDE SOLUTION	2493817: Sample (Sample) 2810564: Sample (Sample)	0.00025 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.00025 x 1000 L IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOD1852	Caustic Soda Liquid 50% 20L Carboys SODIUM HYDROXIDE SOLUTION	2271338: Sample (Sample)	0.000145 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.00725 x 20 L carboys	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
HYACID1834	HYDROCHLORIC ACID 33%, 20 litre carboys (One-Way) HYDROCHLORIC ACID	2382132: Sample (Sample)	0.000205 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.01025 x 20 L carboys	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C		
SOCHIT1811	SODIUM CHLORITE 7.5% 20L Carboys CHLORITE SOLUTION	2509197: Sample (Sample)	0.060318 L	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.003015 x 20 L carboys	UN Number Poison Sch.	1908 5	Pack Group Hazchem	III 2X	CAS Number	7758-19-2 C		
SOPERC4400	Sodium Percarbonate Coated SODIUM CARBONATE PEROXYHYDRATE	154822: Sample (Sample)	0.0001 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
			0.004 x 25 kg bags	UN Number Poison Sch.	3378 6	Pack Group Hazchem	II 1Y	CAS Number	15630-89-4 O, Xn, Xi		
SULACI1832	SULPHURIC ACID 98% 10L Carboy SULPHURIC ACID with more than 51% acid	2837015: Sample (Sample)	0.000019 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.0019 x 10 L carboys	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1917	SULPHURIC ACID 70% 200L Drums SULPHURIC ACID with more than 51% acid	2732415: Sample (Sample)	0.000591 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.002955 x 200 L drums	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		

Dangerous Goods Stock Manifest

Stock by Building

Building Waste Treatment / CAUSOD1857 to
NIACID9300

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CAUSOD1857	Caustic Soda Liquid 50% 1530kg IBC (Returnable) SODIUM HYDROXIDE SOLUTION	2240985: W (IBCs) (Manufacturing)	1.53 tonne 1 x 1530 kg IBCs	Class UN Number Poison Sch.	8 1824 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2R	Physical State CAS Number	Liquid 1310-73-2 C	pH	Conc. Str. Alkali
EFFLUE3000	Effluent Waste Water Weak Alkali (IBC) CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	N/A: W (IBCs) (Manufacturing)	3 KLTR 3 x 1000 L IBCs	Class UN Number Poison Sch.	8 3266 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid	pH	Alkali
EFFLUE4000	Effluent Waste Water Concentrated Alkali (IBC) CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	N/A: W (IBCs) (Manufacturing)	9 KLTR 9 x 1000 L IBCs	Class UN Number Poison Sch.	8 3266 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid	pH	Conc. Str. Alkali
EFFLUE4500	Effluent Waste Water Concentrated Alkali (Bulk/AGT) CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	N/A: W (AGT) (Manufacturing)	10 KLTR 10000 x 1 L bulk	Class UN Number Poison Sch.	8 3266 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid	pH	Conc. Str. Alkali
EFFLUE6000	Effluent Waste Water Concentrated Acid (IBC) CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	N/A: W (IBCs) (Manufacturing)	15 KLTR 15 x 1000 L IBCs	Class UN Number Poison Sch.	8 3264 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid	pH	Conc. Str. Acid
NIACID9300	Nitric Acid 68% Min NITRIC ACID other than red fuming, with at least 65% but not more than 70% nitric acid	146588B: W (IBCs) (Manufacturing)	0.28 tonne 1 x 280 kg drums	Class UN Number Poison Sch.	8 2031 6	Sub. Risk(s) Pack Group Hazchem	5.1 II 2R	Physical State CAS Number	Liquid 7697-37-2 O, C	pH	Acid



Acknowledgement Number: NDG037356

13 February 2015



014 001033
REDOX PTY LTD
2 Swettenham Rd
MINTO NSW 2566

Dear Sir/Madam

RE: Notification of Hazardous Chemicals on Premises: 2 Swettenham Rd, MINTO NSW 2566, AUSTRALIA

We recently wrote to you to let you know about the new hazardous chemical notification requirements under the *Work Health and Safety Regulation 2011 (The Regulation)*.

The new requirements commenced on 1 January 2015. Enclosed is a copy of your new Acknowledgement of Notification for the storage and handling of hazardous chemicals at the above premises.

Your new Acknowledgment of Notification has no expiry date and no further notification will be required unless there are changes to the notified details.

If there are changes to the notified details you will need to complete a form and request the amendment to your notification record, at least 14 days prior to any changes occurring. Significant changes that must be notified include changes to:

- The type
- The quantity
- The location of hazardous chemicals within your premises and/or
- Any change of contact details (including emergency contacts)
- If you no longer occupy the site.

To notify WorkCover NSW of any changes, you need to complete *The Notification of Schedule 11 hazardous chemicals* form. The form and supporting guidelines can be found on the WorkCover NSW website: www.workcover.nsw.gov.au.

We also recently requested that you provide your site plan/s and updated contact details of two emergency contact people by 31 March 2015. This information will help ensure the requirements of the Regulation are met. If you have already provided us with this information, no further action is required and we thank you for responding.

If you have any further enquiries, please refer to the guidelines or phone our Customer Service Centre on 13 10 50.

Yours sincerely,



Fiona Hayman
Operations Manager, Customer Service Centre
WorkCover Authority of NSW



WorkCover NSW
92-100 Dorrimon Street, Gosford, NSW 2250
Locked Bag 2906, Lisarow, NSW 2252
T 02 4321 5000 F 02 4325 4145
WorkCover Assistance Service 13 10 50
DX 731 Sydney workcover.nsw.gov.au

Customer Service Centre – Operations
Ph: 13 10 50 Fax: 02 9287 5500

13 February 2015

REDOX PTY LTD
2 Swettenham Rd
MINTO NSW 2566

ACKNOWLEDGEMENT OF NOTIFICATION OF HAZARDOUS CHEMICALS ON PREMISES

ISSUED UNDER AND SUBJECT TO THE PROVISIONS OF THE WORK HEALTH AND SAFETY
ACT 2011 AND REGULATION THEREUNDER

Acknowledgement Number NDG037356

Issued To REDOX PTY LTD

Trading as

Premises where notified hazardous chemicals are stored/handled

2 Swettenham Rd, MINTO NSW 2566, AUSTRALIA

Emergency Contacts for this site:

1. Malcolm Perrins

Ph. 02 9733 3000

Site Staffing Site Hours: Site Hours: 16 HRS 5 DAYS 120 STAFF

This acknowledgement must be retained as PROOF OF NOTIFICATION
You must notify WorkCover of applicable changes, specified in the Work Health and Safety
Regulation 2011, to the Hazardous Chemicals used, handled or stored on these premises.

Issued To REDOX PTY LTD
Acknowledgement Number NDG037356

13 February 2015

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
B1	Roofed Store	450000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1123	BUTYL ACETATES	3	5000Kg	II
2319	TERPENE HYDROCARBONS, N.O.S.	3	5000Kg	III
1148	DIACETONE ALCOHOL	3	5000Kg	III

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
B2	Roofed Store	450000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1779	FORMIC ACID with more than 85% acid by mass	8	30000Kg	II
3272	ESTERS, N.O.S.	3	5000Kg	III
1779	FORMIC ACID	8	10000Kg	II
2789	ACETIC ACID SOLUTION	8	15000Kg	II

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
C3	Roofed Store	1000000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
2922	CORROSIVE LIQUID, TOXIC, N.O.S.	8	30000Kg	II
1814	POTASSIUM HYDROXIDE SOLUTION	8	2000Kg	II
2922	CORROSIVE LIQUID, TOXIC, N.O.S.	8	20000Kg	II
2672	AMMONIA SOLUTION	8	30000Kg	III
2491	ETHANOLAMINE	8	15000Kg	III
1823	SODIUM HYDROXIDE, SOLID	8	100000Kg	II
1824	SODIUM HYDROXIDE SOLUTION	8	250000Kg	II

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
D1	Roofed Store	1000000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
2586	ALKYLSULPHONIC ACIDS, LIQUID with not more than 5% free sulphuric acid	8	10000Kg	III

This acknowledgement must be retained as PROOF OF NOTIFICATION
You must notify WorkCover of applicable changes, specified in the Work Health and Safety
Regulation 2011, to the Hazardous Chemicals used, handled or stored on these premises.

Issued To REDOX PTY LTD
Acknowledgement Number NDG037356

13 February 2015

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
D1	Roofed Store	1000000		
1805	PHOSPHORIC ACID, SOLUTION	8	10000Kg	III
2967	SULPHAMIC ACID	8	10000Kg	III
3265	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.	8	100000Kg	III
2796	SULFURIC ACID	8	85000Kg	II
1805	PHOSPHORIC ACID	8	100000Kg	III
1789	HYDROCHLORIC ACID	8	149000Kg	II

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
D2	Roofed Store	1000000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1710	TRICHLOROETHYLENE	6.1	10000Kg	III
2659	SODIUM CHLOROACETATE	6.1	20000Kg	III
1593	DICHLOROMETHANE	6.1	70000Kg	III
2674	SODIUM FLUOROSILICATE	6.1	50000Kg	III

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
E2	Roofed Store	1000000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1813	POTASSIUM HYDROXIDE, SOLID	8	30000Kg	II

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
E2	Roofed Store	400000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1849	SODIUM SULFIDE, HYDRATED	8	70000Kg	II
3253	DISODIUM TRIOXOSILICATE	8	70000Kg	III
2949	SODIUM HYDROSULFIDE	8	130000Kg	II
1823	SODIUM HYDROXIDE, SOLID	8	10000Kg	II

This acknowledgement must be retained as PROOF OF NOTIFICATION
You must notify WorkCover of applicable changes, specified in the Work Health and Safety Regulation 2011, to the Hazardous Chemicals used, handled or stored on these premises.



WorkCover NSW
92-100 Donnison Street, Gosford, NSW 2250
Locked Bag 2906, Lisarow, NSW 2252
T 02 4321 5000 F 02 4325 4145
WorkCover Assistance Service 13 10 50
DX 731 Sydney workcover.nsw.gov.au

Issued To REDOX PTY LTD
Acknowledgement Number NDG037356

13 February 2015

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
J1	Roofed Store	250000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1498	SODIUM NITRATE	5.1	2000Kg	III
1486	POTASSIUM NITRATE	5.1	2000Kg	III
1498	SODIUM NITRATE	5.1	1000Kg	III

This acknowledgement must be retained as PROOF OF NOTIFICATION
You must notify WorkCover of applicable changes, specified in the Work Health and Safety
Regulation 2011, to the Hazardous Chemicals used, handled or stored on these premises.

Attachment 4: Notification for Girraween Site



WorkCover NSW
92-100 Donnison Street, Gosford, NSW 2250
Locked Bag 2906, Lisarow, NSW 2252
T 02 4321 5000 F 02 4325 4145
WorkCover Assistance Service 13 10 50
DX 731 Sydney workcover.nsw.gov.au

Acknowledgement Number: NDG001506

13 February 2015

014 003385
Redox Pty Ltd
Locked Bag 15
MINTO NSW 2566

Dear Sir/Madam

RE: Notification of Hazardous Chemicals on Premises: 144 Gilba Rd, GIRRAWEE NSW 2145, AUSTRALIA

We recently wrote to you to let you know about the new hazardous chemical notification requirements under the *Work Health and Safety Regulation 2011 (The Regulation)*.

The new requirements commenced on 1 January 2015. Enclosed is a copy of your new Acknowledgement of Notification for the storage and handling of hazardous chemicals at the above premises.

Your new Acknowledgment of Notification has no expiry date and no further notification will be required unless there are changes to the notified details.

If there are changes to the notified details you will need to complete a form and request the amendment to your notification record, at least 14 days prior to any changes occurring. Significant changes that must be notified include changes to:

- The type
- The quantity
- The location of hazardous chemicals within your premises and/or
- Any change of contact details (including emergency contacts)
- If you no longer occupy the site.

To notify WorkCover NSW of any changes, you need to complete The *Notification of Schedule 11 hazardous chemicals* form. The form and supporting guidelines can be found on the WorkCover NSW website: www.workcover.nsw.gov.au.

We also recently requested that you provide your site plan/s and updated contact details of two emergency contact people by 31 March 2015. This information will help ensure the requirements of the Regulation are met. If you have already provided us with this information, no further action is required and we thank you for responding.

If you have any further enquiries, please refer to the guidelines or phone our Customer Service Centre on 13 10 50.

Yours sincerely,

Fiona Hayman
Operations Manager, Customer Service Centre
WorkCover Authority of NSW



Customer Service Centre – Operations
Ph: 13 10 50 Fax: 02 9287 5500

WorkCover NSW
92-100 Donnison Street, Gosford, NSW 2250
Locked Bag 2906, Lisarow, NSW 2252
T 02 4321 5000 F 02 4325 4145
WorkCover Assistance Service 13 10 50
DX 731 Sydney workcover.nsw.gov.au

13 February 2015

Redox Pty Ltd
Locked Bag 15
MINTO NSW 2566

ACKNOWLEDGEMENT OF NOTIFICATION OF HAZARDOUS CHEMICALS ON PREMISES

ISSUED UNDER AND SUBJECT TO THE PROVISIONS OF THE WORK HEALTH AND SAFETY
ACT 2011 AND REGULATION THEREUNDER

Acknowledgement Number NDG001506

Issued To Redox Pty Ltd

Trading as

Premises where notified hazardous chemicals are stored/handled

144 Gilba Rd, GIRRAWEE NSW 2145, AUSTRALIA

Emergency Contacts for this site:

1. Malcolm Perrins

Ph. 02 9733 3000

Site Staffing Site Hours: Site Hours: 10 HOURS 5 DAYS 9 STAFF

This acknowledgement must be retained as PROOF OF NOTIFICATION
You must notify WorkCover of applicable changes, specified in the Work Health and Safety
Regulation 2011, to the Hazardous Chemicals used, handled or stored on these premises.



WorkCover NSW
92-100 Donnison Street, Gosford, NSW 2250
Locked Bag 2906, Lisarow, NSW 2252
T 02 4321 5000 F 02 4325 4145
WorkCover Assistance Service 13 10 50
DX 731 Sydney workcover.nsw.gov.au

Issued To Redox Pty Ltd
Acknowledgement Number NDG001506

13 February 2015

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
1	Above Ground Tank	3000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1978	PROPANE	2.1	2000L	
Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
2	Roofed Store	18000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
2789	ACETIC ACID SOLUTION	8	18000L	II
Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
3A	Above Ground Tank	10000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1824	SODIUM HYDROXIDE SOLUTION	8	10000L	II
Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
3C	Above Ground Tank	425000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1824	SODIUM HYDROXIDE SOLUTION	8	18000L	II
Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
4A	Above Ground Tank	9000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1791	HYPOCHLORITE SOLUTION	8	9000L	III
Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
4B	Above Ground Tank	9000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1791	HYPOCHLORITE SOLUTION	8	9000L	III
Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
5	Above Ground Tank	17000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1830	SULPHURIC ACID with more than 51% acid	8	10000L	II

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Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
7	Above Ground Tank	22000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
2582	FERRIC CHLORIDE SOLUTION	8	0L	III

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
8	Roofed Store	300000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
2031	NITRIC ACID	8	15000L	II
2582	FERRIC CHLORIDE SOLUTION	8	28000L	III
1830	SULFURIC ACID	8	30000L	II
1760	CORROSIVE LIQUID, N.O.S.	8	35000L	III

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
9	Roofed Store	200000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1791	HYPOCHLORITE SOLUTION	8	17000L	III
2672	AMMONIA SOLUTION	8	20000L	III
1719	CAUSTIC ALKALI LIQUID, N.O.S.	8	40000L	II
1824	SODIUM HYDROXIDE SOLUTION	8	50000L	II

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
10	Roofed Store	90000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1474	MAGNESIUM NITRATE	5.1	20000Kg	III
1500	SODIUM NITRITE	5.1	20000Kg	III

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)		
13	Roofed Store	250000		
UN Number	Product Name	Class/Division	Typical Quantity	Packing Group
1814	POTASSIUM HYDROXIDE SOLUTION	8	10000L	II
1813	POTASSIUM HYDROXIDE, SOLID	8	20000Kg	II

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Issued To Redox Pty Ltd
Acknowledgement Number NDG001506

13 February 2015

Storage ID	Storage Type	Maximum Storage Capacity (Kg/L)	
13	Roofed Store	250000	
1823	SODIUM HYDROXIDE, SOLID	8	20000Kg II

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**PRELIMINARY HAZARD ANALYSIS
FOR COMPLETION OF DEVELOPMENT PROGRAMME
FOR REDOX PTY LTD
2 SWETTENHAM ROAD, MINTO**

Prepared for: Richard Coneliano, Director, Redox Pty Ltd
Malcolm Perrins, Director, Redox Pty Ltd

Prepared by: Linda Zanotto, Senior Environmental Engineer
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Report No: 148292_PHA_Rep_Rev4
September 2018
(Released: 11 September 2018)



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EXECUTIVE SUMMARY

Benbow Environmental has been commissioned by Redox Pty Ltd to prepare a Preliminary Hazard Analysis (PHA) for the implementation of the final stage of the original development programme of the site. This is Stage IV. A Section 75W application is submitted for this final stage of the original development as there are changes to the details that involve dispensing of chemicals not considered in the original consent and the volume of chemicals planned to be stored at the Stage IV area has doubled.

The opportunity is being taken to justify removing the current restrictions on the size of the containers stored in the AS 1940–2017 *The storage and handling of flammable and combustible liquids* designed flammable liquid stores.

Redox Pty Ltd have operated from this site over the past 12-13 years and provide a chemical supply business mainly for Australian and New Zealand businesses.

Redox is now the ninth largest supplier of chemicals in Asia and Australia. Redox is expanding into the US.

Redox purchased a chemical product supplier operating from an industrial site at Girraween – Deltrex. This premises stores chemicals and dispenses these into packages, drums and IBCs.

The original Environmental Impact Statement provided a list of the Class 8 corrosive substances that were expected at that time in the history of Redox to need to be dispensed.

The purchase of this other business sees the need to include food grade products and other chemicals one of which is Class 8 but with a sub risk of flammable I.E. Class 8(3).

The opportunity is also being taken to permit the storage of IBCs of flammable or combustible liquids in the fire rated flammable liquid warehouses B1 and B2.

Due to their location, the PHA submitted with the original development application required the roofs of the warehouses B1 and B2 to have a 180/180/180 fire rating level—a rare requirement for a warehouse. This makes the warehouses suited to storing IBCs. These matters are considered in this preliminary hazard analysis and an accompanying fire safety study.

The Preliminary Hazard Analysis (PHA) has been prepared in accordance with the Multi-Level Risk Assessment and Hazardous Industry Planning Advisory Papers (HIPAPs) guidelines stipulated by the Department of Planning and Environment (DoP&E) NSW. The purpose of the PHA is to assess whether the proposed volume of dangerous goods stored and the proposed change in the already approved operations that occur at the site are offensive or hazardous, thereby posing an unacceptable risk to the surrounding community.

Safeguard measures have also been considered and included in the design and operation of the facility to ensure that the safety and amenity of the neighbouring premises would not be affected by the proposed development.

The original design of this site reduced the risk of cumulative impacts through the following safeguards developed with officers of the then NSW Fire Brigade:

- Flammable and combustible liquids stored in isolated warehousing separated by distance and with the warehouse constructed with 240/240/240 fire rated walls.



- A triple bunding for fire water containment was developed that also separated the site into several fire fighting water containment areas.

For the redesigned Stage IV development, reduction and removal of hazards is the design approach adopted rather than justify a level of risk. Minimising the risk is the design approach Redox have adopted.

The NSW EPA have considered the site to have an Overall Environmental Risk Level of 1.

Redox have also had their Environmental Management rated at Category A which resulted in a 5% reduction in licensing fees.

Section 5 of the report has identified and examined a number of potential events/consequence scenarios that could occur on site. The prevention and protection measures designed into the operations of each of the activities associated with each event were listed and discussed in a Hazard Identification Chart.

From the Hazard Identification Chart, the hazardous events were deemed as unlikely to occur due to the nature of the operations and the proposed prevention and protection measures designed into the facility.

Given the outcomes of the assessment, the Preliminary Hazard Analysis has found that the operation of the proposed development readily meets the criteria laid down in HIPAP No. 4 *Risk Criteria for Land Use Safety Planning* and would not cause any risk, significant or minor, to the community, with the recommended safeguards in place.

Throughout the preparation of this PHA, it has been determined that the proposed development meets all the safety requirements stipulated by DoP&E and hence would not be considered to be an offensive or hazardous development.

Contents

Page

EXECUTIVE SUMMARY	I
1. INTRODUCTION	1
1.1 Chemical Details	1
1.2 Production Quantities	5
2. OVERVIEW OF THE DEVELOPMENT	7
2.1 Current Development	7
2.2 Proposed Development	7
2.3 Hours of Operation	8
3. SITE DETAILS	9
3.1 Site Location	9
3.1.1 Description of the Site	9
3.2 Nearest Identified Sensitive Receptors	15
4. ENVIRONMENTAL ASPECTS	17
4.1 Chemicals and Dangerous Goods	20
4.1.1 Bunding Requirements	24
4.2 Emissions to Land and Water	26
4.2.1 Water Use	27
4.2.2 Stormwater System	27
4.2.3 Potential Impacts and Safeguards	27
4.3 Dangerous Goods Screening Against SEPP33 Thresholds	28
4.4 Dangerous Goods Storage Requirements	29
5. HAZARD ANALYSIS	31
5.1 Level of Assessment	31
5.2 Methodology	31
5.2.1 Hazard Identification	32
5.2.2 Hazard Analysis	32
5.2.2.1 Consequence Estimation	32
5.2.2.2 Probability Likelihood Estimation	32
5.2.3 Risk Evaluation and Assessment against Specific Criteria	32
5.3 Assessment Criteria	32
5.3.1 Individual Fatality Risk Levels	33
5.3.2 Injury Risk Levels	33
5.3.3 Risk of Property Damage and Accident Propagation	34
5.3.4 Criteria for Risk Assessment to the Biophysical Environment	34
5.4 Assessment Criteria Applicable to the Proposed Development Application	35
5.4.1 Heat-Flux Radiation Criteria	35
5.4.2 Explosion Over-Pressure Criteria	36
5.4.3 Toxic Criteria	36
5.4.4 Biophysical Environment Risk Criteria	37
5.5 Risk Classification and Frequency Estimation	37

5.5.1	Risk Classification and Prioritisation Method	38
5.5.1.1	Classification of Type of Activities and Inventories	38
5.5.1.2	Estimation of Consequences	38
5.5.2	Estimation of Probability of a Major Accident	39
5.5.3	Estimation of Societal Risk	41
5.5.4	Societal Risk Estimation of the Proposed Facility	41
5.6	Hazard Identification	42
5.6.1	Hazardous Materials	43
5.6.1.1	Class 3 Flammable Liquids and Combustible Liquids in IBC's	43
5.6.1.2	Combustible Liquids	45
5.6.1.3	Class 8 Corrosive Substances	45
5.7	Warehouse Activities	45
5.7.1	Fires Involving Tank Farms	49
5.7.2	Hazardous Events	51
5.7.2.1	Ignition of Flammable and Combustible Liquids	52
5.7.2.2	Hazard Identification Chart	53
5.7.3	Hazard Identified for Further Analysis	62
5.8	Consequence Analysis – Heat Radiation	65
5.8.1	Scenario 1: Fire involving 5,000 kg of Class 3 flammable liquids at B1/B2	65
5.8.2	Scenario 2: Fire involving 30,000 kg of Class 3 flammable liquids at B1/B2	68
5.8.3	Scenario 3: Fire involving 600,000 kg of Class 3 flammable liquids at B1/B2	71
5.8.4	Scenario 4: Fire involving 100 kg of Class 8(3) liquids	73
5.8.5	Scenario 5: Fire involving 3,000 kg of Class 8(3) liquids	74
5.8.6	Scenario 6: Fire involving 10,000 kg of Class 8(3) liquids	76
5.8.7	Scenario 7: Fire involving 30,000 kg of Class 8(3) liquid	78
5.9	Consequence Analysis – Toxic Combustion Product Emissions	80
5.9.1	Complete Combustion	80
5.9.2	Incomplete Combustion	81
5.9.3	Scenario 8: Ground level concentrations from a fire involving 100 kg of Acetic Acid for a 2 m ² pool area	81
5.9.4	Scenario 9: Ground level concentrations from a fire involving 5000 kg of Acetic acid for a 30 m ² pool area	83
5.9.5	Scenario 10: Ground level concentration from a fire involving 30,000 kg of Acetic acid for a 30 m ² pool area	85
5.9.6	Scenario 11: Ground level concentrations from a fire involving 5,000 kg of Acetic acid for a 120 m ² pool area	86
5.9.7	Scenario 12: Ground level concentrations from a fire involving 30,000 kg of Acetic acid for a 120 m ² pool area	88
5.9.8	Scenario 13: Ground level concentrations from a fire involving 100 kg of Formic acid for a 2 m ² pool area	90
5.9.9	Scenario 14: Ground level concentrations from a fire involving 5000 kg of Formic acid for a 30 m ² pool area	92
5.9.10	Scenario 15: Ground level concentrations from a fire involving 30,000 kg of Formic acid for a 30 m ² pool area	93
5.9.11	Scenario 16: Ground level concentrations from a fire involving 5,000 kg of Formic acid for a 120 m ² pool area	96
5.9.12	Scenario 17: Ground level concentrations from a fire involving 30,000 kg of Formic acid for a 120 m ² pool area	97
5.10	Consequence Analysis – Toxic Emissions from Spills	99

5.10.1	Scenario 18: Spill involving 100 kg of Acetic Acid	100
5.10.2	Scenario 19: Spill involving 5,000 kg of Acetic Acid	101
5.10.3	Scenario 20: Spill involving 100 kg of Formic Acid	103
5.10.4	Scenario 21: Spill involving 5,000 kg of Formic Acid	104
5.11	Discussion of the Findings	106
6.	CONTAINMENT OF CONTAMINATED FIREFIGHTING WATER	108
6.1	Identification of Materials and Hazards	108
6.2	Consequences of Contaminated Fire Water	108
6.3	Estimation of Potential Contaminated Firewater Volumes	108
6.4	Analysis of Contaminated Fire Fighting Water, Treatment and Disposal	109
6.5	Analysis of Contaminated Fire Fighting Water, Treatment and Disposal	109
7.	HAZARD AND RISK ANALYSIS	111
8.	RECOMMENDATIONS	119
9.	CONCLUSION	122
10.	LIMITATIONS	123
11.	REFERENCES	124

Tables	Page
Table 1-1: Comparison of EIS Quantities and Actual Quantities	2
Table 3-1: Nearest Potentially Affected Receivers Considered	16
Table 4-1: Characteristics of Chemicals	22
Table 4-2: Potential Contaminants and Control	27
Table 4-3: Comparison of Screening Threshold Quantities by SEPP 33	28
Table 5-1: Individual Fatality Risk Criteria (HIPAP No. 4)	33
Table 5-2: Heat Radiation Impact (DoP&E HIPAP No. 4)	35
Table 5-3: Adopted Health Criteria Based of Potential Pollutants	37
Table 5-4: Estimation and Assessment of the Proposed Development to the IAEA Method	38
Table 5-5: Estimation of External Consequences	39
Table 5-6: Estimation of Probability of Major Accidents	40
Table 5-7: Estimation of Societal Risk	41
Table 5-8: Fire causes for warehouses storing flammable liquids from 2000-2005	46
Table 5-9: Event/Consequence Analysis Table	54
Table 5-10: Heat Radiation Distances for Scenario 1	65
Table 5-11: Heat Radiation Distances for Scenario 2	68
Table 5-12: Heat Radiation Distances for Scenario 3	71
Table 5-13: Heat Radiation Distances for Scenario 4	73
Table 5-14: Heat Radiation Distances for Scenario 5	74
Table 5-15: Heat Radiation Distances for Scenario 6	76
Table 5-16: Heat Radiation Distances for Scenario 7	78
Table 5-17: Scenario 8: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors	82
Table 5-18: Scenario 9: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors	84

Table 5-19: Scenario 10: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors	85
Table 5-20: Scenario 11: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors	87
Table 5-21: Scenario 12: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors	89
Table 5-22: Scenario 13: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors	91
Table 5-23: Scenario 14: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors	92
Table 5-24: Scenario 15: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors	94
Table 5-25: Scenario 15: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors	95
Table 5-26: Scenario 16: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors	96
Table 5-27: Scenario 17: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors	98
Table 5-28: Scenario 17: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors	99
Table 5-29: Scenario 18: Ground Level Concentration of Acetic Acid at Sensitive Receptors for spill of 100 kg over 2 m ² .	100
Table 5-30: Scenario 19: Adjusted Ground Level Concentration of Acetic Acid at Sensitive Receptors for spill of 5,000 kg over 30 m ² .	102
Table 5-31: Scenario 20: Adjusted Ground Level Concentrations of Formic Acid at Sensitive Receptors for spill of 100 kg over 2 m ² .	103
Table 5-32: Scenario 21: Adjusted Ground Level Concentrations of Formic Acid at Sensitive Receptors for spill of 5,000 kg over 30 m ² .	105
Table 6-1: Required Containment of Contaminated Firewater	109
Table 7-1: Hazard and Risk Register	111

Figures

Page

Figure 3-1: Aerial Photograph of the Project Site Location and the Nearest Potentially Affected Receptors	10
Figure 3-2: Site Location—Local context	11
Figure 3-3: Site Plan	12
Figure 3-4: Dangerous Goods Locations	13
Figure 4-1: Splash Shields	25
Figure 4-2: Bund Location Limits (<i>from Figure 5.1, AS 3780</i>)	26
Figure 5-1: IAEA F-N Curve – Indicative Societal Risk Criteria	41
Figure 5-2: IAEA F-N Curve – Indicative Societal Risk Criteria for the Proposed Operation	42
Figure 5-3: Fire percentage for different material	47
Figure 5-4: Fire Percentage due to different causes	47
Figure 5-5: Heat Radiation Contours for Scenario 1: Pool fire involving 5,000 kg of Class 3 flammable liquids in B1	66
Figure 5-6: Heat Radiation Contours for Scenario 1: Pool fire involving 5,000 kg of Class 3 flammable liquids in B2	67
Figure 5-7: Heat Radiation Contours for Scenario 2: Pool fire involving 30,000 kg of Class 3 flammable liquids in B1	69
Figure 5-8: Heat Radiation Contours for Scenario 2: Pool fire involving 30,000 kg of Class 3 flammable liquids in B2	70

Figure 5-9: Heat Radiation Contours for Scenario 3: Bund fire involving 600,000 kg of Class 3 flammable liquids	72
Figure 5-10: Heat Radiation Contours for Scenario 5: Fire involving 3,000 kg of Class 8(3) liquids	75
Figure 5-11: Heat Radiation Contours for Scenario 6: Fire involving 10,000 kg of Class 8(3) liquids	77
Figure 5-12: Heat Radiation Distances for Scenario 7: Fire involving 30,000 kg of Class 8(3) liquid	79
Figure 5-13: Scenario 1: Ground Level Concentration of Carbon Dioxide Isopleth	83
Figure 5-14: Scenario 9: Ground Level Concentration of Carbon Monoxide Isopleth	84
Figure 5-15: Scenario 10: Ground Level Concentration of Carbon Monoxide Isopleth	86
Figure 5-16: Scenario 11: Ground Level Concentration of Carbon Monoxide Isopleth	87
Figure 5-17: Scenario 12: Ground Level Concentration of Carbon Monoxide Isopleth	89
Figure 5-18: Scenario 13: Ground Level Concentration of Carbon Dioxide Isopleth	91
Figure 5-19: Scenario 14: Ground Level Concentration of Carbon Dioxide Isopleth	93
Figure 5-20: Scenario 15: Ground Level Concentration of Carbon Dioxide Isopleth	94
Figure 5-21: Scenario 15: Ground Level Concentration of Carbon Monoxide Isopleth	95
Figure 5-22: Scenario 16: Ground Level Concentration of Carbon Dioxide Isopleth	97
Figure 5-23: Scenario 17: Ground Level Concentration of Carbon Dioxide Isopleth	98
Figure 5-24: Scenario 17: Ground Level Concentration of Carbon Monoxide Isopleth	99
Figure 5-25: Scenario 18: Adjusted Ground Level Concentration of Acetic Acid Isopleth for spill of 100 kg over 2 m ² .	101
Figure 5-26: Scenario 19: Adjusted Ground Level Concentration of Acetic Acid Isopleth for spill of 5,000 kg over 30 m ² .	102
Figure 5-27: Scenario 20: Adjusted Ground Level Concentrations of Formic Acid Isopleth for spill of 100 kg over 2 m ² .	104
Figure 5-28: Scenario 21: Adjusted Ground Level Concentration of Formic Acid Isopleth for spill of 5,000 kg over 30 m ² .	105

Attachments

- PHA Attachment 1: Redox Minto Dangerous Goods Storage
PHA Attachment 2: Deltrex Girraween Dangerous Goods Storage





1. INTRODUCTION

Benbow Environmental has been commissioned by Redox Pty Ltd to prepare a Preliminary Hazard Analysis (PHA) for the continued use of the flammable liquids warehouses located at 2 Swettenham Road, Minto, NSW and a tank farm/dispensing area for chemicals known as the Stage IV development. It is proposed to extend the storage of flammable liquids to also include IBCs (intermediate bulk containers) as the use of these for flammable and combustible liquids has grown. The original consent did not include IBCs and these are interpreted as being bulk storage. The original consent did not approve bulk storage of flammable and combustible liquids on site. Storage of IBCs is required for C1/C2 combustible liquids, Class 3 flammable liquids and Class 6.1 Packing Group III toxic substances.

The original development application proposed development of the site over four stages, the final stage is now being planned for implementation.

It is intended to extend the number of chemicals that would be diluted, blended and dispensed and slightly vary the type of chemicals. The original proposal included Class 8 corrosive substances only and it is required to extend this to Class 8 (sub risk 3) and food chemicals. Subrisk 3 are flammable liquids.

The purchase of a chemical supply business, Deltrex, and the growth of the food production industry in Australia provides the opportunity for Redox to store, dilute, blend and dispense 12 chemicals belonging to three groups – alkali, acid and food grade. Two of these chemicals are corrosive and have a sub risk of being flammable. These chemical properties were not assessed in the original development application for potential off-site impacts or on-site cumulative impacts. The PHA in support of the current Section 75W application considers the potential hazards that could arise from these changes to the usage of the site.

The Deltrex business would require a larger number of chemicals to be stored at the Stage IV development area than originally assessed.

The original consent allowed for 250 T of Class 8 corrosive substances in bulk in aboveground tanks. An analysis of what is required for the Deltrex business is 540 T stored in bulk in aboveground tanks. The PHA provides the details of the chemicals proposed to be stored in bulk, diluted, decanted and packaged.

The following subsection provides background information on the chemicals approved for storage from the original consent.

1.1 CHEMICAL DETAILS

The maximum quantities of chemicals to be stored are those as presented in Table 2-1 from the original EIS.

The maximum quantity of chemicals related to the Section 75W modification for the Stage IV Class 8 bulk is specified in the table i.e. 250 T of bulk. With the success of the Deltrex operations this quantity would need to be increased to 540 T.



The Section 75W modification is requesting that the range of chemicals allowed to be stored in bulk be varied as detailed in the Section 75W application i.e. Class 8 (sub risk 3) and food grade chemicals – non-dangerous goods as well as Class 8 corrosive liquids. Chemicals proposed to be stored are listed below.

To assist the Department of Planning and Environment a comparison between the quantities of dangerous goods stored as detailed in the original Environmental Impact Statement and the quantities actually stored are presented in Table 2-1 from the original EIS which is reproduced below:

Table 2-1: Dangerous Goods to be Stored at the Site		
Chemical Class	Tonnage	% of total
Non Dangerous Goods	15,795	77.3%
Class 3 (Flammable)	900	4.4%
Class 5.1 (Oxidizing)	250	1.2%
Class 6.1 (Toxic)	850	4.2%
Class 8 Packages (Corrosive)	2,400	11.7%
Class 8 Bulk (Corrosive)	250	1.2%
Total	20,445	100.0%

The EIS listed which buildings would store what Classes of dangerous goods. There have been changes made in the locations used in practice and as the site has been independently audited several times the background to this aspect is not discussed further as it has little relevance to the need for the Section 75W.

The current quantities of dangerous goods based on the actual quantities stored on the WorkCover Notification are shown in Table 1-1.

Table 1-1: Comparison of EIS Quantities and Actual Quantities

	EIS	Actual
Class 3	900 T	20 T
Class 5.1	250 T	5 T
Class 6.1	850 T	150 T
Class 8 packages	2,400 T	1,331 T
Class 8 bulk	250 T	None

Although the actual quantities are less than those approved in the EIS, these quantities are not to be reduced as a result of the Section 75W application. The actual quantities stored would change with the requirements of industry in Australia and New Zealand.

The original EIS detailed the quantity of Class 8 corrosive liquids in bulk to be stored was 250 T. This was to be stored at the Stage IV area with aboveground tanks in a tank farm.

The current quantity of Class 8 (3) and Class 8 corrosive liquids currently stored in bulk at the Girraween site (i.e. Deltrex) is 74 T.



The approved Stage IV quantity of 250 T in bulk is requested to be increased. The subject of the Section 75W application is to allow the following at Area F – described as the Tank Farm in the original EIS.

- Allow Class 8(3) and Class 8(F1) corrosive liquids;
- Allow non-dangerous goods – food grade chemicals – to be stored in bulk and be diluted, decanted and dispensed.

Other than the Class 8 corrosive liquids to be stored, diluted, decanted and dispensed at Area F, the original EIS specified that acetic acid, a Class 8 (sub risk 3) corrosive liquid would be amongst these chemicals.

The Section 75W application desires to clarify the types of Class 8 chemicals to be stored in bulk by providing the detail in this document and allowing the now detailed design of Area F to be approved.

It is further reinforced that there are no changes to the existing dangerous goods and non-dangerous goods storage quantities or Class of dangerous goods to be stored across the other areas of the site. The limitations in the development consent as reproduced below remain in place.

The following table is reproduced from Section 4 Environmental Performance of the original consent:

Dangerous Goods Class	Prohibited	Permitted
Class 1	All	None
Class 2	All	None
Class 3	Packaging group I Subclass 6.1	Packaging groups II and III (unless otherwise prohibited)
Class 4	All	None
Class 5	All except those listed as permitted	Solids of class 5.1, packaging group III
Class 6	Subclass 3 All Class 6.2	All Class 6.1 (unless other, but not class 6.1 with subclass 3)
Class 7	All	None
Class 8	None	All
Class 9	None	All
Non-dangerous goods	None	All

The following is to be noted:

The Section 75W application does not extend to allowing any bulk chemical other than Class 8, Class 8 (sub risk 3) and food grade chemicals which may be non-dangerous goods. One of the Class 8 acids is also a C1 combustible liquid.

No Class 3, Class 5.1, Class 6.1 dangerous goods would be stored, diluted, decanted or dispensed at Area F.



Therefore the preliminary hazard analysis and the fire safety study do not consider any hazards associated with the above dangerous goods as none would be permitted in Area F. It does consider the consequences of the sub Class 3, acid and combustible liquid C1 in detail.

The above table from the development consent did not prohibit Class 8 sub risk 3 dangerous goods. Redox have made the 75W application to ensure they are fully complying with the original consent which did not specifically address Class 8 (sub risk 3) dangerous goods being stored, diluted, decanted and dispensed. It follows that chemicals with other sub risk Classes e.g. Class 8 (sub risk 5.1) or Class 8 (sub risk 6.1) would not be stored or decanted.

The following are the chemicals that may be used in the proposed Stage IV operations.

The information is presented separately for the three “families” of chemicals being acids, alkali and food grade.

- Acids.

Phosphoric acid	Class 8 PGIII	UN1805	79-95 wt%
Sulphuric acid	Class 8 PGII	UN1830	70 wt% and 98 wt%
Ferric chloride	Class 8 PGIII	UN2582	30-60 wt%
Formic acid	Class 8(3) PGII	UN1779	85 wt%
Fluorosilicic acid	Class 8 PGII	UN1778	27 wt%

- Alkali.

Sodium hydroxide	Class 8 PGII	UN1823 solid	99 wt%
		UN1824 liquid	50 wt%
Potassium hydroxide	Class 8 PGII	UN1813 solid	90 wt%
		UN1814 liquid	50 wt%
Hypochlorite solution	Class 8 PGIII	UN1791	12-15 wt%

- Food grade.

Acetic acid	Class 8 (3) PGII	UN2790	75 wt%
		UN2789	90-95 wt%
Citric acid	Non DG	C2 combustible liquid	
Urea ammonium nitrate	Non DG		

Phosphoric acid in food grade may also be diluted in the food grade area of the facility.

The above list is the majority of the chemicals to be used but flexibility is needed to allow other chemicals with similar characteristics to be processed especially as the processes are limited to simple diluting, decanting and dispensing.

The blending tanks each have an agitator to stir the chemical and water. Once the correct concentration has been achieved the chemical is then drained into the packages, drums or IBCs.

Blending, which basically is a mixing of chemicals with water, does not cause a chemical reaction or generation of a fume or gas.

As several of the chemicals have a low vapour pressure, fume from these chemicals – such as acetic and formic acids – may be released from the surface of the chemical within the blending tanks.



This fume is captured by the mechanical exhaust/fume collection duct placed around the top of these blending tanks. The fume is transferred using ducting to the three separate air cleaning scrubbers.

As specific chemicals are diluted with water, excess heat would be generated. Sulphuric acid and sodium hydroxide (as well as potassium hydroxide) both exhibit this characteristic.

To control the temperature a heat exchanger would be used. A cooling tower would provide the source of cooling. The cooling tower would be located outside of the building.

No chemical reactions would occur. The processes used are simple diluting and decanting.

Debagging of dry chemicals may result in dust generation. Dust control measures will be in place. There is no risk of dust explosions.

Incompatible chemicals are present and are segregated by establishing the separate “tank farms” and separate mixing and decanting areas. This segregation and the use of labelling, signage and having the presence of Redox personnel during deliveries of the chemicals will reduce the risk of mixing of incompatible materials to a minimum.

Cumulative hazards that could occur from a fire in this area and/or the adjacent work areas have been prevented by the following measures:

- Existing fire rated wall construction of the adjacent warehouses;
- Separation of the adjacent warehouses from the Stage IV development. This is shown as Area F on site plans;
- Use of fire rated wall construction in the redesigned Stage IV development; and
- Design of the Stage IV development to current best practices has added several safeguard features. The main ones are
 - ▶ Venting of storage and mixing tanks to scrubbers;
 - ▶ Provision of sprinklers above the storage tanks holding the sub risk flammable chemicals; and
 - ▶ Provision of separate bunding so that incompatible chemicals are unable to be mixed during any emergency event.

1.2 PRODUCTION QUANTITIES

The production quantities are based on the following estimates provided by Redox.

The bulk tanks are each of 30,000 L storage.

A bulk tank of a particular chemical could require refilling on a 24 hour basis.

The mixing tanks would hold 12,000 L of chemical.

The average time taken for a mix to be prepared would be 2–3 hours.

There could be 3-6 mixes occurring simultaneously in the nine mixing tanks.



The current level of production is 35,000 L/day.

It is envisaged that the production level could initially double and gradually increase to 100,000 L/day.

These daily production levels equate to 12,000 T per annum at the current production level and increasing to 30,000 T per annum.

A Preliminary Hazard Analysis (PHA) has been prepared to ensure that all potential hazards and risks from the proposed changes are appropriately identified, managed and controlled – if additional controls are deemed necessary.

The PHA has been prepared in accordance with the documents entitled “*Multi-Level Risk Assessment*”, “*Hazardous Industry Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning*” (HIPAP No. 4)” and the “*Hazardous Industry Planning Advisory Paper No. 6 – Guideline for Hazard Analysis*” (HIPAP No. 6), all published by the Department of Planning and Environment (DoP&E).

The study includes the following key aspects of the assessment:

- Assessment of the proposed development with consideration to the provisions of SEPP 33 and the compliance with Safework requirements.
- Evaluation of any potential hazards imposed by the proposed site operations on the surrounding environment and communities.
- Preventing cumulative hazards arising on site.
- Making recommendations on the relevant prevention/protection strategies necessary to minimise the impact and risk of human fatalities, property damage and environmental pollution.



2. OVERVIEW OF THE DEVELOPMENT

The basis of the original development is a useful starting point to outline the proposed changes. It is now some 12 years since the original development on the site occurred.

The original development considered the following site operations:

- Product delivery;
- Storage of products;
- Re-packing packaging and bagging;
- Diluting, decanting and dispensing from bulk storage;
- Product dispatch.

These were to proceed over four stages with the fourth final stage being the diluting and decanting from bulk and dispensing into packages, containers and bulk.

Bulk would be into IBCs, ISO containers or bulk tankers.

Products were originally envisaged as being delivered, stored, and dispatched in two forms:

- Packages, containers and IBCs; and
- Bulk.

The empty packages are cartons of product already brought to site in this form. These are on pallets and are either shrink wrapped or strapped together.

Empty containers are usually 205 L steel drums or 200 L plastic drums, IBCs and bulky bags. To a lesser extent, packages of 20-25 kg to be filled.

2.1 CURRENT DEVELOPMENT

No decanting or dispensing takes place. No bulk storage in aboveground or in-ground tanks or ISO containers exists.

Drums of flammable and combustible liquids are on pallets and these are block stacked 3 high. Further more detailed information is presented in Section 3 Site Details, and Section 4 Environmental Aspects.

2.2 PROPOSED DEVELOPMENT

The PHA relates to altering conditions of consent to permit IBCs of C1/C2 combustible liquids and Class 3 flammable liquids to be stored in Warehouses B1 and B2.

The PHA also relates to the operation of the already approved Stage IV with changes in the chemicals that would be blended, diluted and dispensed.

As certain of the chemicals are Class 8(3), the hazard analysis would need to be more detailed than originally proposed. The presence of incompatible materials i.e. acids and alkali, also required assessment of design requirements in more detail.



Greater analysis of the release of chemicals that are irritants from spillages and fires was also considered essential. These details represented in Section 4.

2.3 HOURS OF OPERATION

Allowed hours of operation are 24x7 but generally the site operates from about 5.30 a.m. to 12.00 a.m. Monday to Friday. Operations outside of these hours is on a needs basis when required.

3. SITE DETAILS

3.1 SITE LOCATION

The site is located at 2 Swettenham Road, Minto, NSW and is described as Lot 1711 in DP 1089572. The site area is approximately 6.05 ha. The proposed site is located within the Campbelltown City Council Local Government Area. Figure 3-1 and Figure 3-2 show the location of the site in its local context. Shown on Figure 3-1 are nearest receiver locations R1 to R13 that are identified further in Sub-Section 3.2.

Figure 3-3 represents the site layout.

The site access is off Campbelltown Road then Swettenham Road from the northern end of Swettenham Road as there is no right hand turn into the site off Swettenham Road which is awkward.

The subject site was zoned 4(b) Industry in the 2002 LEP and is now zoned IN2 in the 2015 LEP.

Figure 3-4 shows the details of where the dangerous goods would be located as permitted by the SafeWork Notification.

3.1.1 Description of the Site

The site is comprised of approximately 6.05 ha and is a flat plateau on the side of a relatively large ridge separating Bow Bowing Canal from the residential area immediately west of the site.

The site offices are located on the northern extent of the site while corporate offices are located off Swettenham Road at the opposite southern extent of the site.

Trucks principally enter and leave from the northern end of the site. The access from the southern entrance to the site has a tight turning circle and is relatively steep. This access is generally limited to site personnel and contractors in cars and vans.

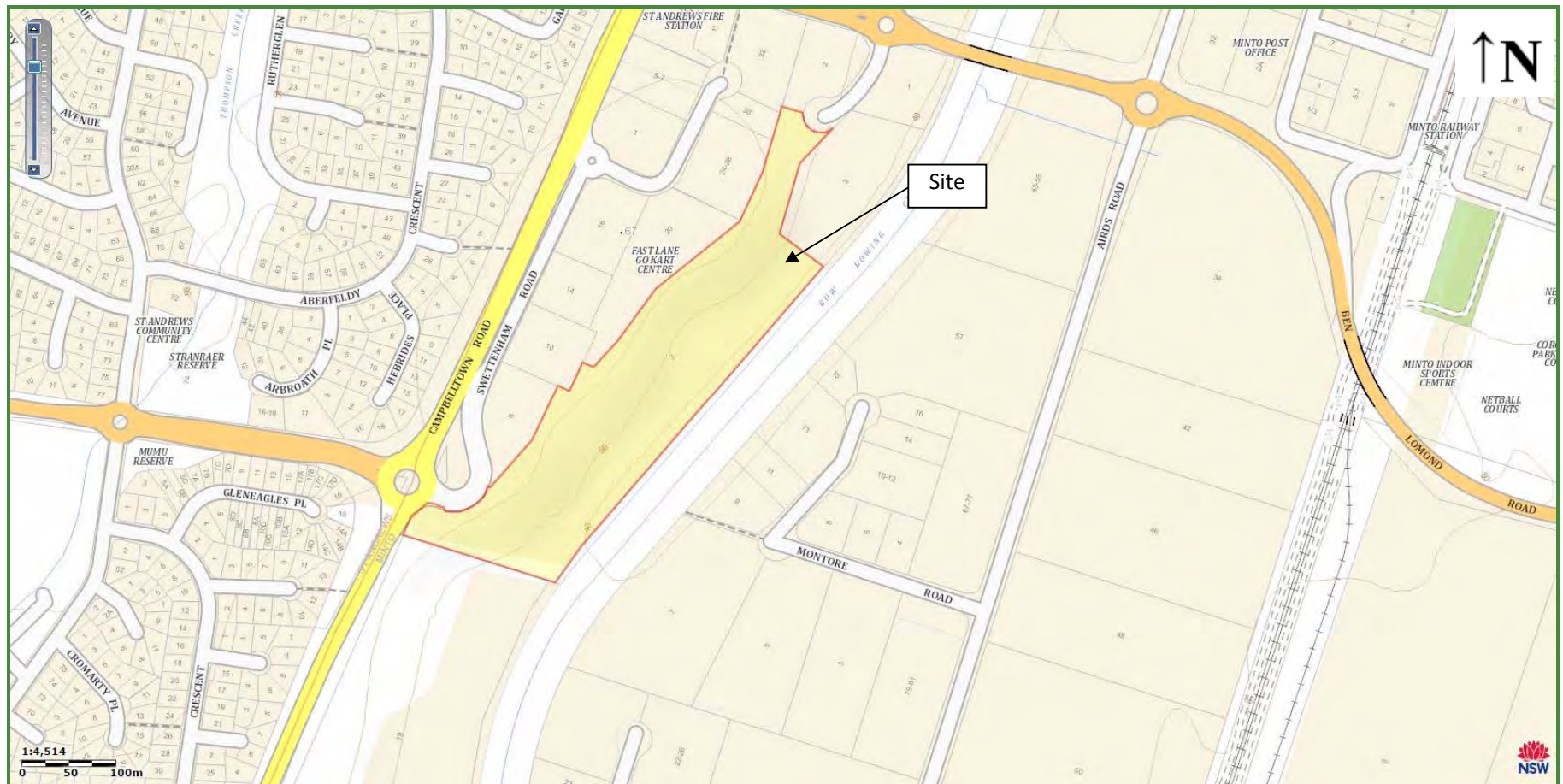
The Stages 1, 2 and 3 consisted of warehouses.

The warehouses are readily sighted on Figure 3-1 and Figure 3-3.

Figure 3-1: Aerial Photograph of the Project Site Location and the Nearest Potentially Affected Receptors



Figure 3-2: Site Location–Local context



Source: <https://maps.six.nsw.gov.au/>

Figure 3-3: Site Plan

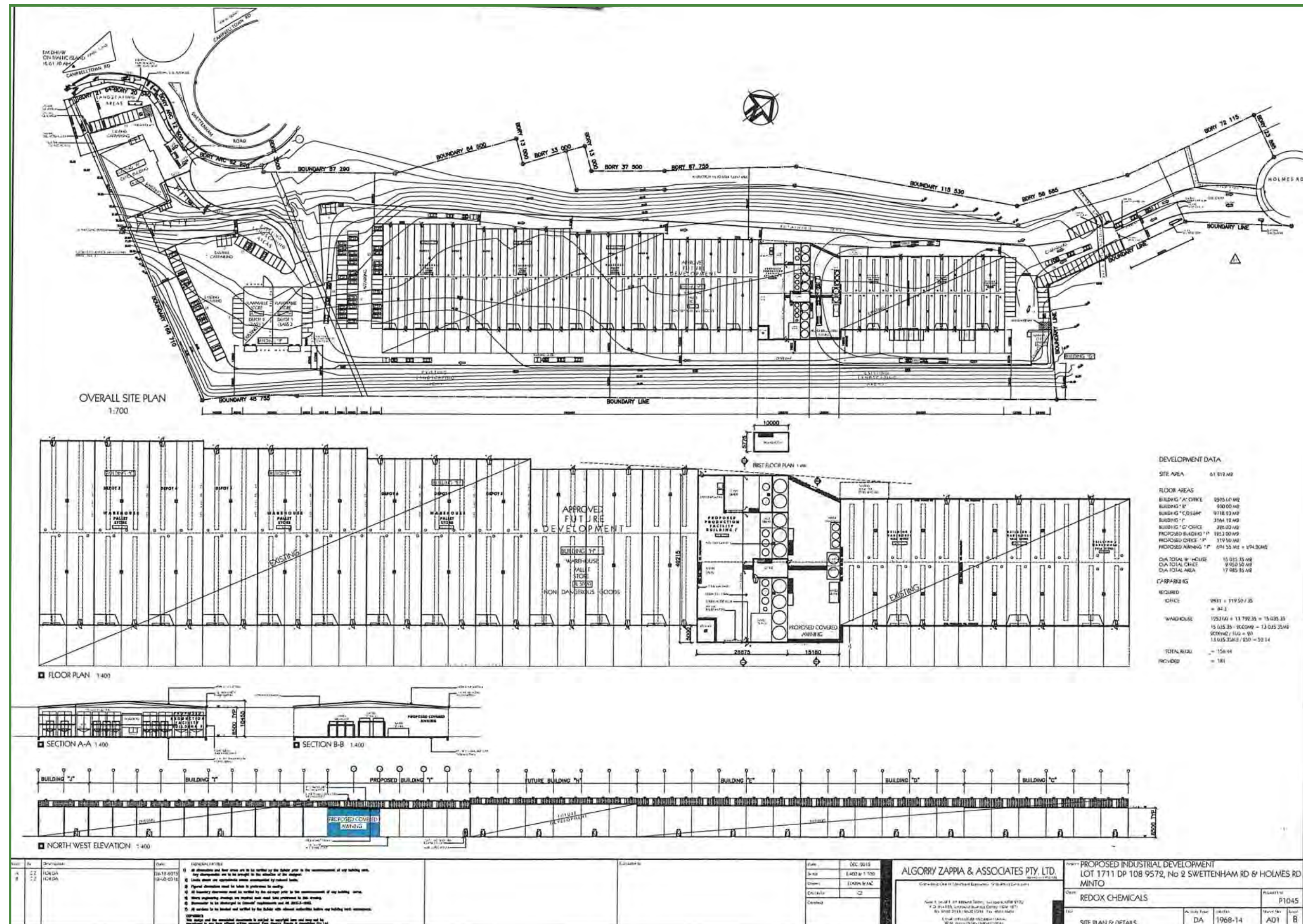
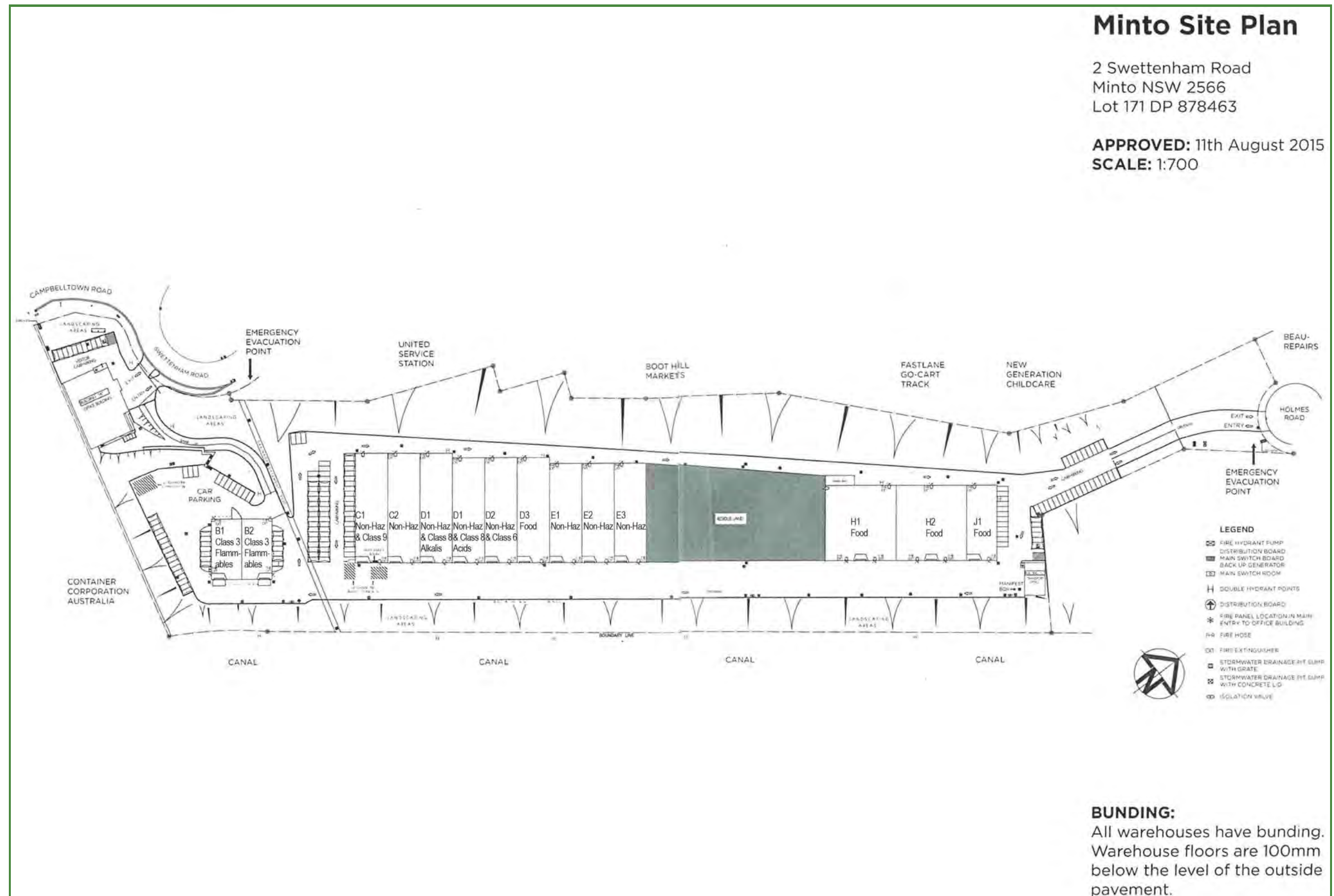


Figure 3-4: Dangerous Goods Locations



Current operations are summarised below.

As noted earlier, Figure 3-1 provides an aerial photograph of the site and the nearest sensitive receptor locations.

The warehouses are denoted by letters on the figure and this designation is used to describe the site.

The dangerous goods currently stored at Redox Minto, and Deltrex Girraween sites are presented in PHA Attachment 1 and PHA Attachment 2 respectively and summarised in Section 4 Environmental Aspects.

- Building A. This is the corporate headquarters for Redox and is at the southern-most extent of the site at the level of Campbelltown and Swettenham Roads.

Car parking is provided adjacent to the building.

The entry into the site at this end is for motor cars and vans only.

Emergency services may enter from this end however the turning circle is tight and would usually be avoided.

Security gates are provided at two location at this end of the site:

- ▶ Site perimeter fence; and
- ▶ Entry onto the road down to the warehouses.

Warehouses are at the reduced ground level of the site.

The designation of warehouses commences at the southern extent of the site.

- Building B1 and B2. These have fire rated construction and are specifically designed for flammable and combustible liquids.

Unloading and loading of product occurs from the eastern side of this building.

Ample clear space exists around Buildings B1 and B2 due to the need for isolation of areas where the storage of flammable and to a lesser extent combustible liquids occurs.

The design of the buildings is not discussed as these exist.

- Buildings C, D and E.

These three buildings are all adjoining each other.

These have awnings along the eastern side for unloading/loading during all weather conditions.

Awnings are cantilevered and have no columns at the request of the then NSW Fire Brigade.

The construction materials are concrete walls.

Each of the buildings have storage of specific Classes of dangerous goods and non dangerous goods.

The buildings store pallets, IBC's and bulky bags of chemicals in accordance with the Notification to SafeWork NSW.

Dangerous goods are located in SafeWork NSW approved storage areas. These were previously described as depots by WorkCover.

At the northern end of Building E, there is vacant land for an approved future development for Building H.

Its future use is for dangerous goods and non-dangerous goods.

To the north of this vacant land is where the production building for the decanting and blending operation would be located. This is designated as Building F. This has also been referred to as Area F and the Stage IV development area.

- Buildings I and J. These are further warehouses to the north of the site and are for storage of dangerous and non dangerous goods.
- Building G. Building G is at the northern extent of the site. This is the site Office operations.

Trucks enter and leave from this end of the site accessing Holmes Road.

3.2 NEAREST IDENTIFIED SENSITIVE RECEPTORS

The following residences and sensitive receivers were considered as the nearest receptors for the assessment.

Table 3-1: Nearest Potentially Affected Receivers Considered

Receptor ID	Address	Lot & DP	Approx. Distance from Proposed Development	Current Use
R1	30 Swettenham Road, Minto	Lot 12 DP 834139	195 m N	Childcare Centre
R2	38 Galloway Crescent, St Andrews	Lot 1 DP 876582	430 m N	Residential
R3	22 Galloway Crescent, St Andrews	Lot 9 DP 876582	325 m NW	Residential
R4	10 Earn Place, St Andrews	Lot 313 DP 261631	265 m NW	Residential
R5	6 Coll Place, St Andrews	Lot 294 DP 261631	240 m W	Residential
R6	18 Hebrides Place, St Andrews	Lot 282 DP 261631	330 m SW	Residential
R7	12 Kintyre Place, St Andrews	Lot 111 DP 263022	505 m SW	Residential
R8	4 Wick Place, St Andrews	Lot 339 DP 260428	680 m SW	Residential
R9	20 Swettenham Road, Minto	Lot 2 DP 834139	85 m N	Industrial
R10	3 Holmes Road, Minto	Lot 172 DP 878463	145 m NE	Industrial
R11	57 Airds Road, Minto	Lot 12 DP 1076508	175 m E	Industrial
R12	13 Montore Road, Minto	Lot 6 DP 1076508	115 m SE	Industrial
R13	9 Montore Road, Minto	Lot 4 DP 1076508	145 m S	Industrial

4. ENVIRONMENTAL ASPECTS

The site exists and has operated since December 2005 free of any adverse environmental impact or pollution incident.

The site stores non dangerous goods as well as large quantities of Classes of dangerous goods in keeping with the original development.

The NSW EPA EPL currently allows up to 5,000 kL on site.

At present the SafeWork NSW Notification lists the following Classes of dangerous goods and quantities of the following classes. A brief description of each Class is provided to assist the reader not familiar with dangerous goods.

Class 3



Flammable liquids.

Flammable liquids and the other remaining classes are divided into three further descriptions depending on the characteristics of the dangerous goods – PGI, PGII or PGIII.

PG stands for packing group.

The level of danger diminishes from PGI to PGIII.

PGI represents great danger – e.g. ether.

PGII represents medium danger e.g. acetone, petrol.

PGIII represents minor damage e.g. kerosene, turpentine.

The storage of Class 3 flammable liquids requires a detailed assessment and safeguards are numerous. Reference to AS 1940–2017 provides detailed guidance on storage and use and handling of flammable and combustible liquids. Combustible liquids are placed into either of two Classes; Class C1 or C2. An example of C1 is diesel; C2 examples are cooking oil and lubricating oil.

Class 5.1



Oxidising substances.

These provide a source of oxygen. Examples are perchloric acid, ammonium nitrates and calcium hypochlorite, commonly known as pool chlorine.

These substances are also highly reactive with other classes of dangerous goods such as acids, alkali. Main safeguard is to provide segregation and, for liquids, separate bunding.

Class 6.1.



Toxic substances.

These are poisonous substances and a number of safeguards are required for their storage, use and handling. Disposal of empty containers is also a critical issue. Preventing contamination of work surfaces and long-term soil or groundwater contamination are important issues. Environmental damage from spillage is a key issue requiring safeguards and training.



Class 8

Corrosive substances.

There are large families of these that are commonly encountered. Acids and alkali both being reactive belong to Class 8 and need special care.

Class 8 substances can be reactive with other Classes such as Divisions 5.1, 5.2 and 6.1. Safeguards are detailed. AS 3780—2008 provides a comprehensive set of guides.



Class 9

Miscellaneous substances.

This Class is becoming more frequently encountered and an Australian Standard provides guidance on storage use and handling

The following quantities of dangerous goods are usually on site.

Class 3	Packing Group II	5 T	
	Packing Group III	15 T	
Class 5.1	Packing Group III	5 T	
Class 6.1	Packing Group III	150 T	
Class 8(3)	Packing Group II	55 T	These would be in bulk in the Stage IV development
	Comprised of Formic acid	40 T	
	Acetic acid solution	15 T	
Class 8	Packing Group II	876 T	
	Packing Group III	345 T	

The chemicals currently used at the “Deltrex” Girraween operation that would be relocated to the Minto site include the following. Many are already present on the Minto site.

Class 3		Nil
Class 5 (6.1)	Packing Group III	4.7 T
Class 5.1 (8)	Packing Group II	6.6 T
Class 8	Packing Group II	707 T
Class 8 (3)	Packing Group II	1.4 T
Class 8	Packing Group III	622 T
Class 8 (C1)	Packing Group III	12.8T
Combustible liquids C1		23 T

The following chemicals within this above summary are already on the Minto site:

- Acetic acid;
- Formic acid;
- Hydrochloric acid;
- Sulphuric acid;
- Phosphoric acid;
- Potassium hydroxide; and
- Sodium hydroxide.

New chemicals to Minto as a result of the redesigned Stage IV development would be the following:

Urea Phosphate	Class 8	Packing Group III	4.8 T
Hypochlorite Solution	Class 8	Packing Group III	35 T
Fluorosilicic acid	Class 8	Packing Group III	70 T
Ferric Chloride	Class 8	Packing Group III	30.7 T

There are specific chemicals at the Girraween site that would not be brought to the Minto site under Clause 4.1 of the 2002 Consent:

Class 5 1(6.1)	Packing Group II
Class 5.1	Packing Group II

By examining this information it can be seen that the Stage IV development as now proposed would not be bringing chemicals to the Minto site that are significantly different to what are already on site. The need for a preliminary hazard analysis may not be a formal requirement but has been undertaken since the original PHA was prepared for the 2002 consent.

A main difference is that the chemicals would be brought in bulk. The quantity brought in bulk is much less than the quantity already on site in containers.

For example, formic acid is present based on the SafeWork notification at a quantity of 40 T.

A bulk storage would be 30 T.

Acetic acid currently 15 T on site in containers would be 30 T in bulk.

Hence the conclusion can be reached that the chemicals being added to the Stage IV operation will not be new to the site however would be handled in bulk as well as in packages and containers that currently occurs.

The handling of chemicals in bulk under controlled conditions requires less handling and less opportunity for human error. The main aspects to be considered are the consequences of major spillages, incorrect mixing of incompatible and react dangerously chemicals and the consequences of a fire on the existing Minto facility.

The following studies have therefore been conducted for reasons as explained.

- A preliminary hazard analysis.

Although similar chemicals are already present on the Minto site and there is in place an approval to operate the Stage IV part of the development, it was not originally envisaged to dilute and decant formic acid and acetic acid both having sub risk Class 3 flammable liquid.

A preliminary hazard analysis has been prepared for this aspect of the diluting and decanting operation.

- A fire safety study.

Fire and Rescue NSW were involved in the design process of the original development and instrumental in many of the design aspects incorporated into the fire services and environmental safeguards.

A fire safety study is considered to be warranted due to the presence of Class 8 corrosive sub risk Class 3 flammable substances formic acid and acetic acids.

A fire could be initiated at the tanker unloading area or within the tank farm or during the diluting operations. However an extensive set of safeguards have been considered and designed into the proposed facility.

The safeguards would isolate any fire to areas that are bunded and have fire walls in place (FRL of 240/240/240) that would adequately contain a fire and prevent heat of radiation exposing adjoining warehouses. In the awning area of the new Building "F", the separation distance of the bulk storage tanks to Building "I" is 15 m and is adequate for protection of this building from heat of radiation from a pool fire in the bunded area provided for the bulk storage tanks.

The second level of bulk storage tanks for those storing flammable liquids (i.e. Class 8(3)) and combustible liquid, the supporting structures need a 180/180/180 FRL.

Fire services would consist of the requirements to satisfy the National Code of Construction. As an added precaution, as certain Class 8 substances have a sub risk of Class 3, hose reels would have the facility of being able to be connected to foam. In addition a 205 L drum of AFFF foam would be available for the use of Fire and Rescue NSW if needed in an emergency. An updated emergency plan would detail where this is kept on a pallet.

4.1 CHEMICALS AND DANGEROUS GOODS

The facility would not be considered to be a *Major Hazard Facility* as the chemicals to be stored on-site do not meet the exceed the thresholds outlined in the Dangerous Goods Regulations relating to Major Hazard Facilities.

Storage of chemicals at the facility will be in accordance with the requirements of the *Work Health and Safety Regulation 2017* as well as following Australian/New Zealand Standards:

- AS 1940–2017 The storage and handling of flammable and combustible liquids;
- AS/NZS 3833:2007 *The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers*;

- AS 3780–2008/Amdt 1–2009 *The storage and handling of corrosive substances.*

The site operates an extensive dangerous goods and non dangerous goods storage and logistics business with an extensive set of safeguards that have proven to be very effective since the site was originally designed.

The installation of the Stage IV development in today's environment will not require many new safeguards for the site as those that are existing are best practice even for today.

The design of the Stage IV development however will benefit from inclusion of additional safeguards that would not have necessarily been required when the site was originally designed and these mainly relate to fire containment and reduction in human factors in causing an incident to occur.

These additional safeguards are the more extensive use of fire rated walls and bunding so that containment of a pool fire, and preventing the spread of a fire are more easily contained by the design of the facility and allow Fire and Rescue NSW greater time in bringing an emergency incident under control.

The characteristics of the chemicals now proposed to be diluted and decanted vary from the original Class 8 corrosive substances. There is also the need to now include food grade products.

The characteristics of the chemicals of most relevance are vapour pressure and flash point for chemicals that are flammable or combustible.

The propensity for release of pungent fume/odour that would have an adverse effect on fire officers and more distant potential receivers during an emergency has been considered by using the air quality assessment to predict ground level concentrations of uncontrolled release of formic and acetic acid during spillages, heat of radiation causing fume to be released or during incomplete combustion during a fire.

The majority of sites have terrain which can be considered flat for distant receivers and products of combustion are usually not incident at ground level.

However, the Minto site is located adjoining a sharp relief and during an emergency incident with breeze or wind from the easterly sectors, a plume could be incident within the residential area located on the western side of Campbelltown Road.

The findings of this part of the assessment is provided in the preliminary hazard analysis.

The following table present the characteristics of the chemicals proposed to be stored, diluted and decanted. Water leads the table as a reference for vapour pressure.



Table 4-1: Characteristics of Chemicals

Chemical	Vapour Pressure at °C	Flash Point	Pungency and Odour	Flammable or Combustible	Toxic combustion	Incompatible	Risk rating for off site impacts
Water	24 mm Hg @ 25°C						
Phosphoric acid Class 8 PGIII UN1805	0.03 mm Hg @ 20°C 43 mm Hg @ 25°C	Not relevant	Slight acidic odour	No	Oxides products of phosphorus	Alkali Sulphuric acid Water	Low
Formic acid Class 8(3) PGII UN1778, 1779	35 mm Hg @ 20°C 43 mm Hg @ 25°C	69°C Depends on % strength ¹	Highly pungent	Flammable or Combustible C1 Depends on % strength	Carbon monoxide Acrid smoke Irritating fumes	Alkali Sulphuric acid	Moderate
Acetic acid Class 8(3) PGII UN2789, 2790	11.4 mm Hg @ 20°C 15.7 mm Hg @ 25°C	39°C	Highly pungent	Flammable	Irritating fumes	Violent reaction with alkali Incompatible with strong acids	Moderate
Ferric chloride Class 8 PGIII UN1830	Negligible at ambient conditions	Not relevant	Slight odour similar to hydrochloric acid	No	Toxic fumes of hydrogen chloride	Reacts with sulphuric acid to produce toxic gases	Moderate
Sulphuric acid Class 8 PGIII UN1778	Negligible at ambient conditions	Not relevant	Very slight acidic odour	No	Toxic fumes of sulfur oxides	Alkali Acetic acid Ferric chloride Fluorosilicic acid	Low
Fluorosilicic acid Class 8 PGII UN1778	22 mm Hg @25°C	Not relevant	Pungent	No	Toxic fumes of fluoride	Alkali Sulphuric acid Water	Low
Citric acid Non DG	Negligible	100°C	Odourless	Combustible C2	Acrid smoke Irritating fumes	Alkali	Low to negligible
Hypochlorite solution Class 8 PGIII UN1791	12-17 mm Hg @ 20°C	Not relevant	Slight chlorine (bleach) odour, disagreeable.	No	Toxic fumes of hydrogen chloride and sodium oxide	Acids with generation of toxic gas chlorine	Low



Table 4-1: Characteristics of Chemicals

Chemical	Vapour Pressure at °C	Flash Point	Pungency and Odour	Flammable or Combustible	Toxic combustion	Incompatible	Risk rating for off site impacts
Sodium hydroxide Class 8 PGII UN1823, 1824	Nil at ambient conditions	Not relevant	Odourless	No	Toxic fumes of sodium oxide	Water Acids	Low
Potassium hydroxide Class 8 PGIII UN1813, 1814	Nil at ambient conditions	Not relevant	odourless	No	Toxic fumes of potassium oxide	Water Acids	Low
Urea ammonium nitrate Non DG	Nil	Not relevant	odourless	No	Not relevant	None	Negligible

Note: ¹Flash point also reported as 50°C at 90% aqueous solution so dependent on strength of the solution.

The above list is the majority of the chemicals to be used but as noted earlier flexibility is needed to allow other chemicals with similar characteristics to be processed through the storage, blending, diluting and decanting steps.



A report entitled “*Lycopodium Upgrade Design Report 4418-REP-06*” dated September 2015 reviewed the operational design of the proposed Stage IV facility. This report is not included in this public document as it provides proprietary information. It would be available on request.

The characteristics that are of most relevance to be considered in the design of the facility to prevent off site amenity or hazard effects are the following:

- Vapour density would readily allow for fumes to be released.

These are formic acid and acetic acid as the fumes released are pungent.

- Flammable.

Formic acid and acetic acid have flash points that allow the vapours to ignite in presence of an ignition source or source of heat.

- React dangerously or incompatible.

The table shows there to be many of the chemicals that are not to mix or come into contact.

This characteristic is well understood by Redox and the basis of the design of their facility has been to provide the following safeguards which would prevent mixing of incompatible chemicals being a credible event.

Separate storage tank areas are provided, with separate bunding, separate tanker unloading areas and separate diluting/decanting systems and vents are ducted to separate scrubbers.

For an emergency event, further safeguards consisting of fire rated walls are provided between the three mixing areas.

4.1.1 Bunding Requirements

The bulk storage tank bunding volumes are based on 110% of a tank in each of the three separate “tank farms”.

The plans do not clearly show that there are two rows of the bulk storage tanks.

The second row of tanks would be supported on a structure. The Class 8 (3) chemicals and the citric acid would require this structure to have a 180/180/180 fire rating level.

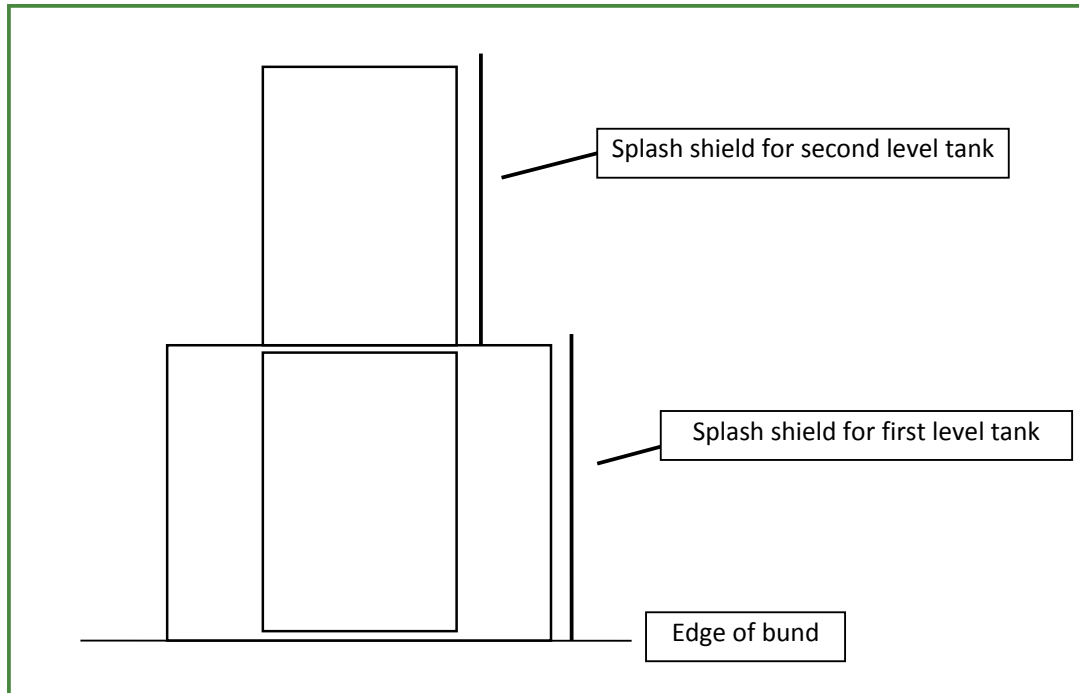
To satisfy the crest locus limit one of three solutions could be adopted:

- Make the footprint of the bunded area with a very large floor area. This is impractical as the space is not available.
- Use splash shields around the bund reaching up to the height of the second tank so that any overfilling or other release of chemical from the second level tank would drain down the inside of the splash shield into the bunded area.

This is a commonly used method.

- Place a splash shield around the outside of the second level tank fixed to the surface of the tank as shown in the diagram below. The bottom end of the shield from the upper level tank must satisfy the crest locus limit so that any leaking from the top of the tank will always be directed into the bund.

Figure 4-1: Splash Shields



This bund is not shared with the diluting/dispensing vessels. For each of the three families of chemicals i.e. alkali, acids and food grade, separate bunded areas are required as it is standard practice to have separate bunded areas for alkali and acids.

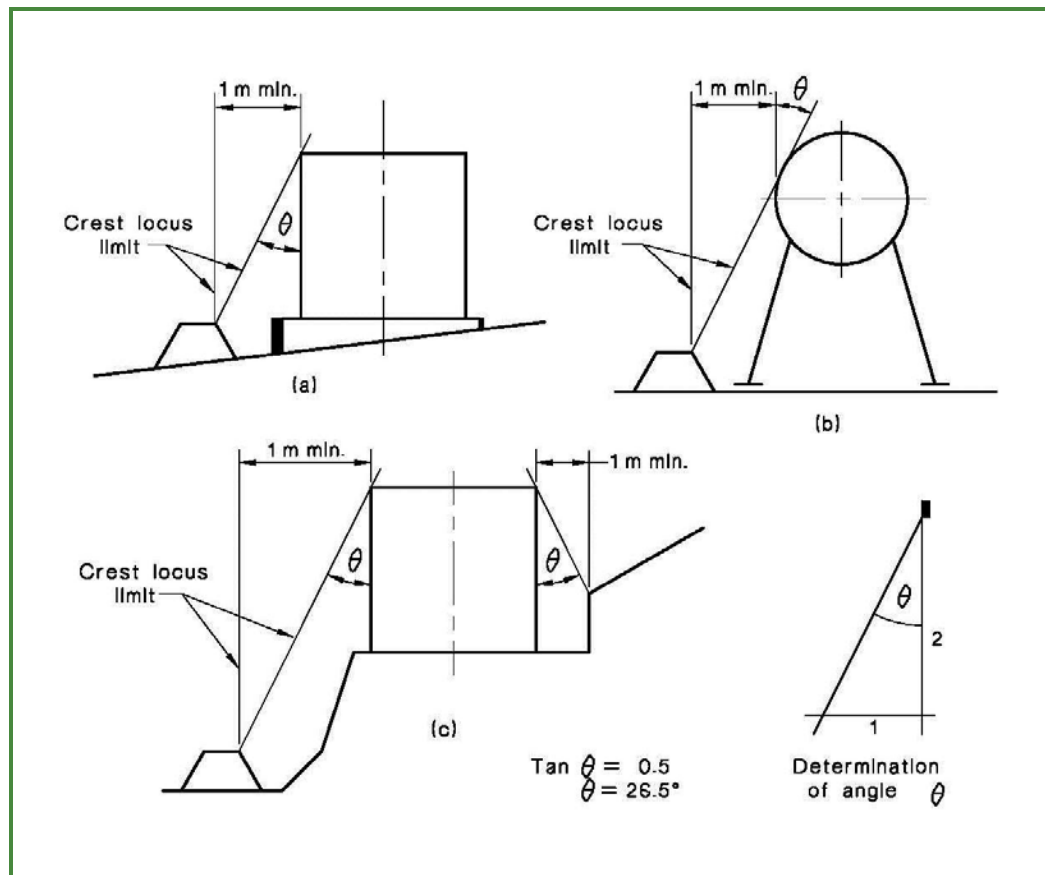
The bunded areas will need to have the concrete and any steel within the bunded areas sealed with epoxy resin to prevent corrosion.

Each of the bunded areas and the two tanker unloading/loading areas will need to drain to sumps in the event of a spillage occurring.

The filling lines would require spill trays beneath these lines or an equivalent means of ensuring chemicals do not make contact with the concrete floor. Use of polypropylene trays that drain to a sump is a useful means.

Walls of suitable materials would be needed around the long sides of the bunds so that the crest locus limits in the Australian Standards AS 1940 and AS 3780 would be satisfied. The following diagram shows what this means, courtesy of AS 3780.

Figure 4-2: Bund Location Limits (from Figure 5.1, AS 3780)



4.2 EMISSIONS TO LAND AND WATER

This section addresses the potential impacts on land and water and the management of these impacts as a result of proposed activities.

Emissions to land are prevented so that the sub soil and ground water are protected from risk of acid leaching through the concrete.

The operational areas also need to be kept in a clean state free of deposits of chemicals.

This is especially so for chemicals such as sodium hydroxide which is hygroscopic.

The following method of protecting the concrete and work surfaces would be used:

- Bunded areas of the “tank farms” and the mixing tanks would be sealed with a high quality epoxy resin.
- Preventative maintenance of piping system and transfer pumps.
- Areas immediately below filling lines would have polypropylene trays or a equivalent method of capturing potential releases from filling packages.

Routine washing of the operational areas is common practice.



4.2.1 Water Use

Water would be used in the demineralisation plant to provide the water for dilution of the decanted products. There would be industrial wastewater generated requiring a licence from Sydney Water.

4.2.2 Stormwater System

The site's stormwater system as exists on site and would not be altered. Safeguard measures were included during the original development of the site. As already discussed, the design of the Stage IV facility includes further safeguards consisting of bunding, splash shields, separate production areas for incompatible chemicals and roofed and bunded road tanker unloading areas.

Existing stormwater pits have particulate filters installed. The area between the site and Bow Bowing Creek has been landscaped to reduce the potential for erosion.

4.2.3 Potential Impacts and Safeguards

Potential contaminant pathways that may lead to impacts on land and water from the revised Stage IV development have been identified as follows:

- Spillages or incidents from the unloading of chemicals;
- Spillages or incidents resulting from the storage and handling of chemicals;
- Release of contaminated firefighting water;
- Fuel, oil, grit/soil from car parking and use of driveways; and
- Litter.

These potential incidents, impacts and safeguard measures have been summarised in the following table.

Table 4-2: Potential Contaminants and Control

Potential Contaminant and Source	Potential Impact on Stormwater	Control
Spillages or incidents from the unloading of chemicals	Contamination of stormwater and/or land	Sealed site, stormwater particulate filters in place, spill kits, use of epoxy resin, housekeeping practices
Spillages or incidents resulting from the storage and handling of chemicals	Contamination of stormwater and/or land	Bunding of chemical storage areas, epoxy resin work areas, spill kits.
Release of contaminated fire fighting water	Contamination of stormwater and/or land	Building bunding, bunding of "tank farms", site's isolation system for stormwater

Table 4-2: Potential Contaminants and Control

Potential Contaminant and Source	Potential Impact on Stormwater	Control
Fuel, oil, grit/soil from car parking and use of driveways	Spills of fuel, release of grit causing contamination of stormwater and sedimentation of local waterways	Stormwater particulate filters, housekeeping practices, routine use of ride-on sweeper
Litter	Contamination of land and or stormwater	Designated waste storage areas

Safeguard measures include:

- Bunding to contain spillages or leaks of chemicals and to retain 90 mins of fire fighting water;
- Stormwater pollution control devices;
- Spill kits; and
- Designated waste storage areas.

4.3 DANGEROUS GOODS SCREENING AGAINST SEPP33 THRESHOLDS

Dangerous Goods to be stored onsite have been assessed against the screening threshold limits outlined in “Applying SEPP 33,” a guideline published by the Department of Planning and Environment. This initial screening process determines whether the proposal is potentially hazardous, and provides guidance on the level of analysis that is required.

Table 4-3: Comparison of Screening Threshold Quantities by SEPP 33

Class	Description	Quantity to be stored	Threshold Quantity	Triggers SEPP33
Class 1.2	Explosives	None	N/A	N/A
Class 1.3	Explosives	None	N/A	N/A
Class 2.1	Flammable Gases	None	N/A	N/A
Class 2.2	Non-Flammable Gases	None	N/A	N/A
Class 2.3	Toxic gases	None	N/A	N/A
Class 3 PGI	Flammable Liquid	None	N/A	N/A
Class 3 PGII and PGIII	Flammable Liquids	900 tonne	Yes	Already approved
Class 4.1	Flammable Solid	None	N/A	N/A
Class 4.2	Flammable Solid	None	N/A	N/A
Class 4.3	Dangerous when wet	None	N/A	N/A
Class 5.1	Oxidising Substances	None	Yes	Already approved
Class 5.2	Organic Peroxides	None	N/A	N/A
Class 6.1 PGII and PGIII	Toxic Substances	None	Yes	Already approved
Class 6.2	Infectious Substances	None	N/A	N/A



Table 4-3: Comparison of Screening Threshold Quantities by SEPP 33

Class	Description	Quantity to be stored	Threshold Quantity	Triggers SEPP33
Class 8 PGI	Corrosive Substances	None	N/A	N/A
Class 8 PGII	Corrosive Substances	2650 T ²	Yes	Already approved
Class 8 PGIII	Corrosive Substances	Included in above	50 tonne	Already approved
Class 9	Miscellaneous	N/A	N/A	N/A

Note: ¹ – Water Capacity

² – 2400 T in packages and 250 T in bulk

The PHA is required for the following reasons:

- C1/C2 combustible liquids and Class 3 flammable liquids need to be stored in IBCs which are considered as being bulk storage.
- Class 6 PGIII may need to be stored in IBCs.
- A larger quantity of Class 8(3) and Class 8 corrosive substances and food grade chemicals amounting to 540 T would be stored at the stage IV of the development. This was originally going to be 250 T. Also Class 8(3) chemicals that include acetic acid would be stored, blended, diluted and dispensed.

Formic acid included amongst the chemicals is a C1 combustible liquid. Citric acid is a C2 combustible liquid.

4.4 DANGEROUS GOODS STORAGE REQUIREMENTS

The site would be designed to conform to the *Work Health and Safety Regulation 2017*, and relevant Australian Standards.

All dangerous good storage and handling practices would comply with:

- Work Health and Safety Act 2011;
- Work Health and Safety Regulation 2017;
- Dangerous Goods (Road and Rail Transport) Act 2008;
- Dangerous Goods (Road and Rail Transport) Regulation 2009;
- How to Manage Work Health and Safety Risks Code of Practice 2011;
- AS 1940–2017 *The Storage and Handling of Flammable and Combustible Liquids*;
- AS 3780–2008 *The Storage and Handling of Corrosive Substances*;
- AS/NZS 3833:2007 – *The Storage and Handling of Mixed Classes of Dangerous Goods in Packages and Intermediate Bulk Containers*;
- AS/NZS 4452:1997 – *The storage and handling of toxic substances*;
- AS/NZS 4804:2001 *Occupational Health and Safety Management Systems – General Guidelines on Principles, Systems and Supporting Techniques*;
- SafeWork Australia – National Standard for the Storage and Handling of Dangerous Goods [NOHSC:1015 (2001)];



- SafeWork Australia – National Code of Practice for the Storage and Handling of Dangerous Goods [NOHSC:2017 (2001)];
- How to manage risk of hazardous chemicals (N.S.W. Code of Practice provided as guidance until approved in 2012);
- Globally Harmonised System of Classification and Labelling of Chemicals 6th Revised Edition (2015);
- Guidance on the Classification of Hazardous Chemicals under the WHS Regulations;
- Safe Work Australia ISBN 978-0-642-78340-0; and
- Australian Dangerous Goods (ADG) Code 7th Edition.

Dangerous goods would be stored based on their compatibilities. Incompatible substances would be segregated in accordance with AS/NZS 3833:2007.

The following classes would be kept separate by at least 5 m or with intervening fire rated walls and separate bunding:

- Alkali and acids;
- Food grade and either alkali or acids.



5. HAZARD ANALYSIS

5.1 LEVEL OF ASSESSMENT

The Multi-Level Risk Assessment approach has been developed and recommended by the Department of Planning and Environment (DoP&E). It relies on a systematic and analytical approach to the identification and analysis of hazards and the quantification of offsite risks assessing any risk tolerability and land use safety implications. The DoP&E has advocated a merit-based approach, wherein the level and extent of analysis must be appropriate to the hazards present and therefore, need only progress to the extent necessary for the particular case.

There are three levels of assessment specified in the Multi-Level Risk Assessment (DoP&E 2011) document and they are listed below.

Level 1 – Qualitative Analysis: primarily based on the hazard identification techniques. A level 1 assessment can be justified if the analysis of the facility demonstrates Societal Risk in the *negligible zone* and there are no potential accidents with significant off-site consequences.

Level 2 – Partially Quantitative Analysis: using hazard identification and the focused quantification of key potential off-site risk contributors. A level 2 assessment can be justified when the Societal Risk estimates fall within the middle *ALARP zone* or if one or more significant risk contributors had been identified but the frequency of risk contributors having off-site consequences is relatively low.

Level 3 – Fully Quantitative Risk Analysis: based on the full and detailed quantification of risks, consistent with HIPAP No. 6. A level 3 assessment is required where the Societal Risk from the facility estimates fall within the *intolerable zone* or where there are significant off-site risk contributors, and a level 2 assessment is unable to demonstrate that the risk criteria will be met.

5.2 METHODOLOGY

The procedures adopted in assessing hazardous impacts, depending on the level of risk assessment required, may involve the following steps:

- Step 1: Hazard identification;
- Step 2: Hazard analysis (consequence and probability estimations); and
- Step 3: Risk evaluation and assessment against specific criteria.

The following sections of the report discuss the hazard identification process as prescribed by the Department of Planning and Environment (DoP&E 2011) in the documents *Multi-Level Risk Assessment* and *Hazardous Industry Planning Advisory Paper No 4 (HIPAP No. 6) – Guidelines for Hazard Analysis*.



5.2.1 Hazard Identification

This is the first step in the risk assessment. It involves the identification of all theoretically possible hazardous events as the basis for further quantification and analysis. This does not in any way imply that the hazard identified or its theoretically possible impact will occur in practice. Essentially, it identifies the particular characteristics and nature of hazards to be further evaluated in order to quantify potential risks.

To identify hazards, a survey of operations was carried out to isolate the events which are outside normal operating conditions and which have the potential to impact outside the boundaries of the site. In accordance with HIPAP 6, these events do not include occurrences that are a normal part of the operation cycles of the site but rather the atypical and abnormal, such as the occurrence of a significant liquid spill during product transfer operations.

5.2.2 Hazard Analysis

After a review of the events identified in the hazard identification stage and the identification of prevention/protection measures incorporated into the design of the site, any events which are considered to have the potential to result in impacts offsite or which have the potential to escalate to larger incidents are carried over to the next stage of analysis.

5.2.2.1 Consequence Estimation

This aspect involves the analysis and modelling of the credible events carried forward from the hazard identification process in order to quantify their impacts outside the boundaries of the site. In this case, these events typically include fire and the potential effects on people and/or damage to property.

5.2.2.2 Probability Likelihood Estimation

If necessary, the likelihood of incidents are quantified by adopting probability and likelihood factors derived from published data.

5.2.3 Risk Evaluation and Assessment against Specific Criteria

The risk analysis includes the assessment of consequences for each hazardous event and the frequencies of each initiating failure. The results of these consequence calculations together with the probabilities and likelihood figures estimated were then compared against the accepted criteria, as specified by DoP&E. Whether it is considered necessary to conduct the predictions would depend on the probability figures, likelihood estimations, and if the risk criteria are exceeded.

5.3 ASSESSMENT CRITERIA

The risk criteria applied by Department of Planning and Environment are published in the document *Hazardous Industry Planning Advisory Paper No 4* (HIPAP No. 4) - *Risk Criteria for Land Use Safety Planning* (DoP&E 2011). The following is a general discussion of the criteria that is used to assess the risk of a development on the surrounding community and environment.



5.3.1 Individual Fatality Risk Levels

The following paragraphs have been reproduced from HIPAP No. 4 to describe individual fatality risk levels:

“People in hospitals, children at school or old-aged people are more vulnerable to hazards and less able to take evasive action, if need be, relative to the average residential population. A lower risk than the one in a million criteria (applicable for residential areas) may be more appropriate for such cases. On the other hand, land uses such as commercial and open space do not involve continuous occupancy by the same people.

The individual’s occupancy of these areas is on an intermittent basis and the people present are generally mobile. As such, a higher level of risk (relative to the permanent housing occupancy exposure) may be tolerated. A higher level of risk still is generally considered acceptable in industrial areas.” (DoP&E 2011)

The risk assessment criteria for individual fatality risk are presented below.

Table 5-1: Individual Fatality Risk Criteria (HIPAP No. 4)

Land Use	Risk Criteria x 10 ⁻⁶ (per year)
Hospitals, schools, childcare facilities, old age housing	0.5
Residential, hotels, motels, tourist resorts	1
Commercial developments including retail centres, offices and entertainment centres	5
Sporting complexes and active open space	10
Industrial	50

Figures in the table above have been utilised in the assessment.

5.3.2 Injury Risk Levels

HIPAP No. 4 provides guideline criteria for heat of radiation, explosion overpressure and toxic exposure. The quoted requirements from the referenced document have been summarised as follows:

- Guideline criteria for heat of radiation:

“Incident heat flux radiation at residential and sensitive use areas should not exceed 4.7 kW/m², at frequencies of more than 50 chances in a million per year.”

- Guideline criteria for explosion overpressure:

“Incident explosion overpressure at residential and sensitive use areas should not exceed 7 kPa at frequencies of more than 50 chances in a million per year.”



- Guideline criteria for toxic exposure:

“Toxic concentrations in residential areas should not exceed a level that would be seriously injurious to sensitive members of the community following a relatively short period of exposure at maximum frequency of 10 in a million per year.”

and

“Toxic concentrations in residential areas should not cause irritation to the eyes or throat, coughing or other acute physiological responses in sensitive members of the community over a maximum frequency of 50 in a million per year.”

Please note that a risk hazard assessment only examines events that are considered to have the potential for significant off-site consequences and may not entirely reflect all variations in people’s vulnerability to risk.

5.3.3 Risk of Property Damage and Accident Propagation

HIPAP No. 4 indicates that siting of a hazardous installation must account for the potential for propagation of an accident, causing a “domino” effect on adjoining premises. This risk would be expected within an industrial estate where siting of hazardous materials on one site may potentially cause hazardous materials on an adjoining premises to further develop the size of the accident.

The criteria for risk of damage to property and of accident propagation are stated as follows:

“Incident heat flux at neighbouring potentially hazardous installations or at land zones to accommodate such installations should not exceed a risk of 50 in a million per year for the 23 kW/m² heat flux level.”

and

“Incident explosion overpressure at neighbouring potentially hazardous installations, at land zoned to accommodate such installations or at nearest public buildings should not exceed a risk of 50 in a million per year for the 14 kPa explosion overpressure level.”

5.3.4 Criteria for Risk Assessment to the Biophysical Environment

The assessment of the ultimate effects from toxic releases into the natural ecosystem is difficult, particularly in the case of atypical accidental releases. Consequence data is limited and factors influencing the outcome are variable and complex. In many cases, it may not be possible or practical to establish the final impact of any particular release. Because of such complexity, it is inappropriate to provide generalised criteria to cover any scenario. The acceptability of the risk will depend upon the value of the potentially affected zone or ecosystem to the local community and wider society.

The suggested criteria for sensitive environmental areas relate to the potential effects of an accidental release or an emission on the long-term viability of the ecosystem or any species within it and are expressed as follows:



“Industrial developments should not be sited in proximity to sensitive natural environmental areas where the effects or consequences of the more likely accidental emissions may threaten the long-term viability of the ecosystem or any species within it.”

and

“Industrial developments should not be sited in proximity to sensitive natural environmental areas where the likelihood or probability of impacts that may threaten the long-term viability of the ecosystem or any species within it is not substantially lower than the existing background level threat to the ecosystem.”

5.4 ASSESSMENT CRITERIA APPLICABLE TO THE PROPOSED DEVELOPMENT APPLICATION

In accordance with *HIPAP No 4 Risk Criteria for Land Use Safety Planning*, the following discussion of the risk assessment criteria considered applicable to the proposed development has been provided.

5.4.1 Heat-Flux Radiation Criteria

As the chemical to be stored on site include Class 8(3) and Class 8(F1) corrosive substances, Class 3 flammable liquids and also a C1 combustible liquid, the heat flux radiation criteria have been deemed applicable to the site. Heat radiation models have been conducted to determine compliance with these criteria.

The effects of various heat fluxes (radiation) as a result of a fire incident are given in Table 5-2. The HIPAP No 4 paper (DoP&E 2011) suggests a heat flux of 4.7 kW/m² and a frequency of 50 in a million per year to be used as the risk injury criterion for thermal effects at residential and sensitive use areas.

Table 5-2: Heat Radiation Impact (DoP&E HIPAP No. 4)

Heat Flux Level	Effect
4.7 kW/m ²	Heat radiation level for possibility of injury to persons exposed. This heat radiation level is regarded to be high enough to potentially cause pain in 15-20 seconds and injury after 30 seconds of exposure.
12.6 kW/m ²	Heat radiation level for possibility of fatality at extended exposure and structural failure of nearby affected structures. At this level, injury is highly probable with a significant possibility for fatality to occur. Thin steel may undergo structural failure due to thermal stress and the temperature of wooden structures may increase to a heat where exposure to a naked flame can trigger ignition.
23 kW/m ²	Heat radiation level for possibility of fatality at instantaneous exposure and definite structural failure of nearby unprotected structures. The possibility for fatality is likely at this level, with spontaneous ignition of wood after long exposure and structural failure of unprotected steel due to thermal stress.
35 kW/m ²	Cellulosic material will pilot ignite within one minute's exposure. Significant chance of fatality for people exposed instantaneously.



5.4.2 Explosion Over-Pressure Criteria

As no explosive materials will be stored onsite, the explosion over-pressure criteria has been deemed not applicable.

5.4.3 Toxic Criteria

The toxic exposure criteria have been deemed applicable due to the potential for toxic vapour releases and toxic combustion emissions from the storage of Class 8(3) corrosive liquids acetic and formic acids. HIPAP No. 4 indicates that citing of potentially hazardous developments also needs to consider the risk from accidental releases into the biophysical environment.

The National Institute for Occupational Safety and Health (NIOSH) (provides IDLH) and the American Industrial Hygiene Association (AIHA) (ERPG vales) provides the following 4 categories of health impact criteria which are of relevance during an emergency event:

- Immediately Dangerous to Life or Health (IDLH).
- Emergency Response Planning Guideline 1 (ERPG1).
- Emergency Response Planning Guideline 2 (ERPG2).
- Emergency Response Planning Guideline 3 (ERPG3).

The purpose of the values given for each of these limits for a particular chemical is to assess the capabilities of mitigation safeguards and emergency or accident response plans for the workplace.

These are explained in more detail.

The IDLH limit is defined by the Occupational Safety and Health Administration (OSHA) as:

“An atmospheric concentration of any toxic, corrosive or asphyxiant substance that poses an immediate threat to life or would cause irreversible or delayed adverse health effects or would interfere with an individual’s ability to escape from a dangerous atmosphere.”

The following are definitions for each ERPG level as defined by American Industrial Hygiene Association, 2013 Emergency Response Planning Guidelines (ERPG) and Workplace Environmental Exposure Levels (WEEL) Handbook:

“The ERPG-1 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hour without experiencing more than mild, transient adverse health effects or without perceiving a clearly defined objectionable odour.

The ERPG-2 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual’s ability to take protective action.



The ERPG-3 is the maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects."

The ERPG-2 level can be considered synonymous to the IDLH limit, although it has been observed that both slightly vary from each when comparing values for each contaminant. For this reason, both IDLH and ERPG limits were required to be considered in this assessment.

The toxic exposure criteria adopted in this assessment for the toxic chemicals potentially emitted from the site are defined in Table 5-3.

Table 5-3: Adopted Health Criteria Based of Potential Pollutants

Chemical	Health Limits (in mg/m ³)			
	IDLH	ERPG-1	ERPG-2	ERPG-3
Formic acid	57	5.7	47.5	475
Acetic acid	125	12.5	87.5	625
Carbon Monoxide	1,374.72	229.12	400.96	572.80
Carbon Dioxide	72,000	–	–	–

Note: – indicates that no limits are available for this substance

5.4.4 Biophysical Environment Risk Criteria

The site is located within an established industrial area. The proposed area would be fully paved and sufficiently bunded to accommodate the proposed storage of chemicals and goods.

Any leaks/spills resulting from incidents would be captured within the corresponding bund provided. Spill kits would be provided at all areas that are identified to be prone to spills. A housekeeping inspection would be undertaken regularly to ensure that no leaks or spills would occur on site.

Best practice in housekeeping and operational procedures would be implemented on site. Given this consideration, the proposed development would not introduce any additional risk that may threaten the long-term viability of the development and its effect to the local environment. Consequently, the DoP&E-based criteria have been determined to be readily satisfied and no further analyses or discussions were considered necessary.

5.5 RISK CLASSIFICATION AND FREQUENCY ESTIMATION

The consequences of an accident involving a particular hazardous substance depends on the type and quantity of hazardous substance, the type of activity using the substance as well as the exposed population.

Risk classification and societal risk estimation of the proposed storage of dangerous goods have been conducted in accordance with the prescribed "Multi-Level Risk Assessment" guideline published by the Department of Planning and Environment (DOP&E). The risk classification and frequency estimation is used to determine the level of assessment required for the facility.

The following sections provide summary of the analysis and the results.

5.5.1 Risk Classification and Prioritisation Method

The Department of Planning and Environment document “*Multi-Level Risk Assessment*” (DOP&E 2011) outlines a method of risk classification and prioritisation to assist in assessment of risks. The technique is based on the Manual for classification of risks due to major accidents in processes and other related industries (IAEA rev 1, 1996).

The IAEA method was developed to produce a broad estimate of the risks due to major accidents from the production, storage, handling and transport of hazardous materials. This method relies on broad estimations of consequences and likelihood of accidents which outputs can be used to determine the appropriate level of further assessment. The technique involves three stages:

- Estimation of the consequences;
- Estimation of the probability of a major accident happening; and
- Estimation of societal risk.

The risk classification and prioritisation method have been carried out for the proposed storage of the Class 8(3) dangerous goods at Area F. These goods were identified to have the potential for significant off-site impacts. The risk classification and prioritisation method does not apply to Class 8 dangerous goods so have thus been omitted from this method. These goods have been assessed in the qualitative analysis provided in Section 5.6.

5.5.1.1 Classification of Type of Activities and Inventories

The classification of the materials stored onsite is provided as Table 5-4 in accordance to the IAEA Table II.

Table 5-4: Estimation and Assessment of the Proposed Development to the IAEA Method

Scenario	Assumptions / Figures Used	IAEA Method Criteria	Scenario Criteria Comparison & Comments
Storage of 600 tonnes of Class 3 flammable liquids	Vapour pressure <0.3 bar at 20°C	IAEA Table IV(a) provides classification of A1 A2	Maximum affected distance is 0–25 m with an effect area of 0.8 ha of 0.1 ha

5.5.1.2 Estimation of Consequences

The consequences of a major accident would depend on the type of substance, activity, the quantities of dangerous goods involved, and the population exposed to the predicted consequence. After excluding substances and activities which neither present a significant offsite risk nor could potentially affect adjacent inventories, the following steps were undertaken:



- Classify the activity;
- Estimate the effect distances and areas;
- Estimate the population distribution; and
- Consider Mitigation Correction Factors, which takes into account possible mitigation actions that people could take in the subject event, such as evacuation and sheltering.

An estimate of the external consequences of a major accident may be calculated using these factors.

For the purpose of being able to construct the Societal Risk Plot that would closely describe the risks associated with the proposed development, the following conservative assumptions and calculations were made:

- An average industrial population density of 15 person/ha is used for the storage of Class 3 dangerous goods. (Figure 3-1 shows only industrial premises and no residences within the 0.8 ha affected area for Class 3 goods) and Class 6.1 goods of low toxicity; and
- Correction factor of 1 for both flammables and toxics and was used for mitigation (as per IAEA Table VIII).

The external consequences $C_{a,s}$ are given by the following formula:

$$C_{a,s} = A \times d \times f_A \times f_m$$

The estimation of external consequences is provided as Table 5-5.

Table 5-5: Estimation of External Consequences

Scenario	Population Density (people/ha) (d)	Population Correction Factor (f_A)	Mitigation Correction Factor (f_m)	The affected area (ha) (A)	External Consequence ($C_{a,s}$)
Storage of 1,200 tonnes of Class 3 flammable liquids	15	1	1	0.8	12
Storage of 850 tonnes of Class 6.1 toxic substances	15	1	1	0.1	1.5

The table above shows that the estimation of external consequences within the proposed operation would be 12 possible fatalities for the storage of Class 3 flammable liquids and 1.5 for the toxic substances of low toxicity.

5.5.2 Estimation of Probability of a Major Accident

The method used for estimating probability is based on probability numbers related to the type of installation and hazardous substance used, together with the following probability correction factors:



- Frequency of loading/unloading operations;
- Provision of safety systems associated with the storage and handling of flammable substances;
- A quantitative assessment of the management and safety levels of the organisation; and
- A quantitative assessment of the wind direction towards a populated area.

For the purpose of being able to construct the Societal Risk Plot that would closely describe the risks associated with the proposed development, the following conservative assumptions were made:

- The loading/unloading frequency has been conservatively assumed to be 500–2000 times per year;
- Average industry practice was selected; and
- A conservative assumption of 0-5% of the affected zone is populated within the affected area for Class 3's (where people are living).

The probability number is calculated as follows:

$$N_{i,s} = N^*_{i,s} + N_L + N_F + N_O + N_P$$

An estimate of the probability of a major accident was calculated using these factors and have been provided in Table 5-6.

Table 5-6: Estimation of Probability of Major Accidents

Scenario	$N^*_{i,s}$	n_l	n_f	n_o	n_p	$N_{i,s}$	P
Storage of 1,200 tonnes of Class 3 flammable liquids	8	-2	0	0	0	6	1×10^{-6}
Storage of 850 tonnes of Class 6.1	5	-2	0	0	0	3	1×10^{-3}

Note: $N^*_{i,s}$ = Average probability number for the installation and the substance
 n_l = Probability number correction parameter for loading/unloading operations frequency
 n_f = Probability number correction parameter for flammables
 n_o = Probability number correction parameter for organisational safety
 n_p = Probability number correction parameter for wind direction towards populated area in the affected zone
 $N_{i,s}$ = probability number
 P = Frequencies (Event/Year)

It can be seen that the frequency of a major accident occurring for the maximum storage of Class 3 flammable liquids is one incident per 1 million years and for Class 6 toxic substances one incident per 1000 years. This was used in the estimation of societal risk.

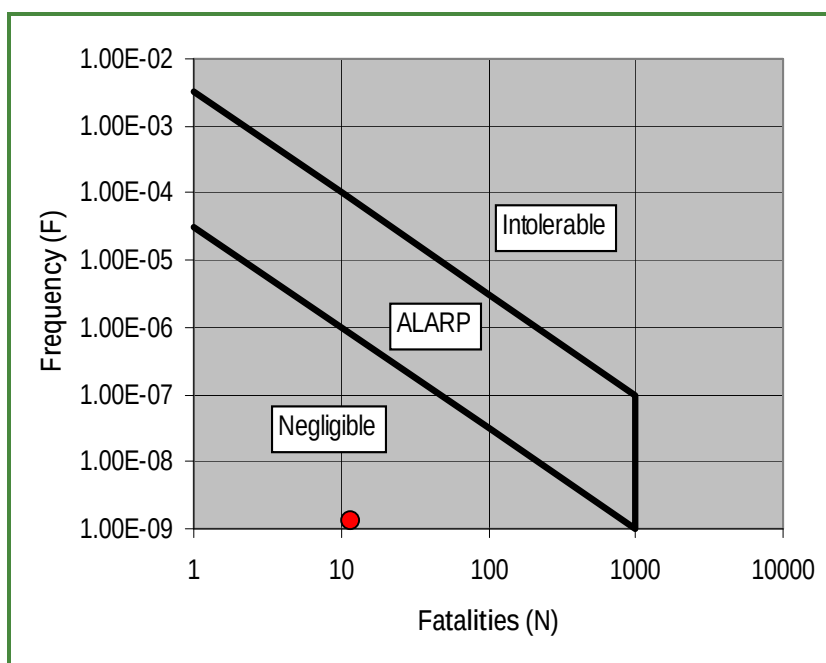
5.5.3 Estimation of Societal Risk

At this stage, pairs of numbers have been calculated for each activity which consists of the number of fatalities per accident and the expected frequency of the accident. The results plotted on a frequency versus consequence (F-N curve) plot and a direct estimate of societal risk can be determined. The F-N curve is divided into three regions:

- Negligible – accidents are not considered to have significant off-site consequences;
- ALARP – while risk of an accident may be tolerable, steps should be taken to reduce the risk level to as low as reasonably possible (ALARP); and
- Intolerable – risk of an accident with the potential for significant off-site consequences is unacceptable.

The F-N curve used to classify societal risk is shown in Figure 5-1.

Figure 5-1: IAEA F-N Curve – Indicative Societal Risk Criteria



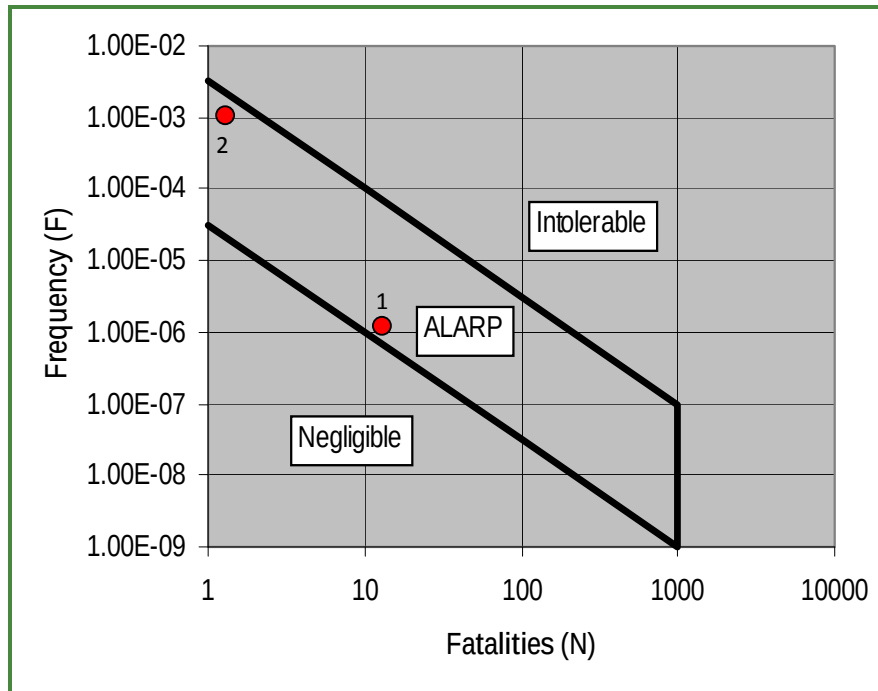
5.5.4 Societal Risk Estimation of the Proposed Facility

The societal risk for the proposed facility has been estimated using the IAEA method and presented as Table 5-7 and Figure 5-2.

Table 5-7: Estimation of Societal Risk

Scenario	C (Fatalities/Accident)	P (Accidents/year)
Storage of 1,200 tonnes of Class 3 flammable liquids	12	1×10^{-6}
Storage of 850 tonnes of Class 6 toxic substances	1.5	1×10^{-3}

Figure 5-2: IAEA F-N Curve – Indicative Societal Risk Criteria for the Proposed Operation



NOTES: 1 Flammable liquid in IBCs at Warehouses B1/B2.
2 Toxic substances in IBCs at Warehouse.

Plotting the consequence (C) figures against the frequency (P) values on a graph provided in Figure 5-2 provides plot-to-plot comparison with the IAEA F-N curve provided as Figure 5-1. Comparison shows that the Societal Risk of the proposed operation falls within the ALARP zone for the storage of Class 3 and Class 6.1 dangerous goods. These results are obtained after incorporating all the conservative assumptions necessary to estimate the associated risk.

Risk: Defined in terms of consequences and likelihood (probability) of an incident occurring.

Individual risk of fatality: Probability i.e. chance/likelihood of this occurring per year.

Societal risk: Relation between number of people killed in a single incident and the chance or likelihood this number will be exceeded.

5.6 HAZARD IDENTIFICATION

The level of assessment required is dependent on a risk-based method which relies on broad estimations of consequences and likelihood of accidents. Based on the risk classification and prioritisation technique used in Section 5.5, it can then be concluded that the hazards associated with the storage of Class 3 dangerous goods falls under the ALARP zone. This means that off-site risks may be significant but are likely to be well within the quantitative criteria. Therefore a Level 2 Partially Quantitative Risk Assessment has been undertaken to determine the level of risk of the proposed development, in particular the storage of Class 3 dangerous goods, to its surroundings.

A level 2 risk assessment involves the hazard identification step, which examines all possible failure scenarios and their consequences to ensure that all incidents with possible off-site consequences are identified. Those events that could contribute to off-site risk will then be



examined in further detail of the consequences and likelihood in order to demonstrate that quantitative risk criteria will not be exceeded.

5.6.1 Hazardous Materials

The site already has approval for the Classes of dangerous goods being assessed. The PHA is addressing the following:

- Warehouses B1/B2
Storage of Class 3 flammable liquids, C1/C2 combustible liquids in IBCs. Although these warehouses have approval for storage of 600 T each, the quantities to be stored in IBCs would be stored in far less quantities. The assessment is on the basis of the worst possible events if the whole of each warehouse were full of IBCs.
- For Class 6.1 toxic substances of PGIII, these are already stored and would be stored in IBCs to 10% of the approved volumes. The quantity stored of 20 T would not require assessment. A condition of consent would limit the quantity stored in IBCs to be 20 T.
- For Class 8(3) (i.e. acetic acid) and the Class 8 which is combustible (i.e. formic acid) worst case conditions have been assessed.
Credible events are spillages of quantities of acetic acid in the range 100 kg to less than 500 kg. Larger spillages are not credible events with the controls in place.

A summary of the properties and potential hazards of these substances is given below.

5.6.1.1 Class 3 Flammable Liquids and Combustible Liquids in IBC's

Flammable liquids are classified as Class 3 dangerous goods. These liquids produce vapour that can be ignited in air on contact with a suitable ignition source.

The storage and handling of flammable liquids therefore present hazards that extend to the following:

- Risk of fire;
- Risk of spillage inside the warehouse;
- Risk of fume generation;
- Risk of subsoil contamination;
- Risk of contamination of an external area during truck unloading and loading with subsequent rainfall causing stormwater contamination.

The risk of fire and fume generation are those with the highest severity of consequence and are the most likely events which could occur and have off site impacts.

Risk of fire is considered in considerable detail. The initiating events are examined in Section 5.7.2. These events are then examined using a quantitative analysis based on the Netherlands TNO Software. Heat of radiation levels are calculated for a range of fires engulfing the flammable liquid storage area. The potential for there to be toxic levels of air contaminants as a result of the combustion occurring during a fire are then examined.



The safeguards to mitigate and reduce the level of risk to a satisfactory level are based on adherence to recognised standards of practice. The standards applied are those based on the following:

- AS 1940–2017 *The storage and handling of flammable and combustible liquids*; and
- NFPA 30: *Flammable and Combustible Liquids code*.

Buildings B1 and B2 are unique to this site having construction consisting of 240/240/240 FRL walls and a 180/180/180 FRL roof to protect off site areas from drums that could “BLEVE” during a fire. B1 and B2 contain up to 450 T/KL of Class 3 flammables and combustible liquids (total 900 T/KL). The two buildings are separated by a 240/240/240 FRL wall.

The hazards arising from this event have largely been resolved by the manufacturers of flammable and combustible liquids now using self-relieving drums. However the need for self-relieving drums is not necessary for storage in warehouses B1 and B2 because of its design, namely the roof.

The characteristics of flammable liquid are volatility and ease of ignition.

At present the drums on pallets are block stacked with flammable liquids being kept to a 3 high stack of pallets. Failure of a drum could occur if a pallet does not have 3 or 4 drums and no binding such that a drum could topple and split. Assuming a spark from an edge of the drum ignited the spilt flammable liquid, spread of a fire could cause a pool fire to envelop other products.

A similar event would be rupture by the tyres of a forklift and a spark occurring during this incident.

IBC’s are to be introduced into these warehouses as the use of IBC’s for flammable and combustible liquids are now extensive throughout the community.

The most likely cause of a spillage of the contents of an IBC is rupture by the tyre of a forklift. Generation of a spark is unlikely with this scenario however if ignition occurred, a rapidly spreading pool fire could occur.

Potential events identified in the hazard identification charts will be assessed for offsite impacts. Heat of radiation contours are presented.

Flammable liquids are classified as Class 3 dangerous goods. These liquids produce vapour that can be ignited in air on contact with a suitable ignition source. They need to be kept away from sources of ignition and avoid contact with skin. On burning, the product will emit toxic fumes.

The handling of Class 8(3) corrosive substances within the Stage IV facility requires this aspect to be considered by establishing hazardous area zones. They are flammable and irritating to skin.

This aspect would be more fully evaluated in the design of the facility prior to construction.

It has already been identified as a matter requiring design in the Design Report prepared by Lycopodium.



The presence of chemicals with sub risk 3 even though the Packing Group is III, requires the acid storage tanks, the mixer vessel and this area of the Stage IV facility to be protected from risk of ignition by applying the hazardous area zoning requirements of AS/NZS 60079.

By applying the requirements of AS/NZS 60079, the area would be protected from risk of explosion or fire.

Due to the need to dilute and decant sub risk flammable liquids, the surrounding areas need protection from the heat of radiation from the bulk storage tanks and the mixing tanks.

The tanker unloading area would also have protection to the adjacent warehouse using fire rated walls as shown on the site plan.

The bunded areas would contain a pool fire and the 240/240/240 fire rated walls would prevent a fire exposure to other areas of the Stage IV facility which could otherwise result in damage and failure of tanks and mixing vessels.

5.6.1.2 Combustible Liquids

Combustible liquids C1 and C2 have less volatility and require higher temperatures to ignite. Combustible liquids do not require protection through use of hazardous zones areas unless these are heated. Flammable liquids within a warehouse where there is no dispensing require a Zone II hazardous area.

5.6.1.3 Class 8 Corrosive Substances

Corrosive substances have characteristics that cause corrosion to the skin, eyes and respiratory system if spillages occur and contact is made with a person's body.

Corrosive substances if spilt can readily corrode the surfaces of a building floor, wall cladding and structural steel.

Different chemicals belonging to Class 8 corrosive substances can be compatible and can be reactive. Hence for this development Redox Australia have wisely chosen to use separate buildings with separate bunding systems – one for acids and one for alkali. The two buildings would have a shared opening.

In addition, the following additional safeguards would be in place as also noted elsewhere in this document:

- Tanker connections for acids and alkalis are different sizes. Each connection is also clearly labelled. All pipework is clearly labelled. Plant supervisor present while tanker deliveries of raw material occur.
- A work procedure is in place. Internal audits of use of procedures is in place.

5.7 WAREHOUSE ACTIVITIES

The warehousing operations involve the unloading, storage and reloading of products on trucks for local transport. The majority of the activities of the warehouse are associated with consumer



products. Rack storage with product on pallets is the common method of the operation of the majority of the warehouse.

The dangerous goods activity is able to be segregated into a designated area that is able to be separated from the general warehouse. This benefits reducing the activities around the area where dangerous goods are stored and hence reduces the risk of accidental damage occurring to a container holding liquid dangerous goods.

A study of accidents that occurred over a five year period revealed the causes of accidents or events that led to fires in warehouses in developed countries that included the USE, UK, Australia, China and Germany. The analysis of fire is shown in the table below.

The percentage figures of Table 5-8 are useful in assessing the relative importance of each cause of fire and stored material during this period.

Table 5-8: Fire causes for warehouses storing flammable liquids from 2000-2005

Stored Material	No. of fires due to different causes					Total	% Distribution
	Spillage	Electrical Fault	Safety Issues	Accident	Unknown		
Paint	1	1			1	3	13%
Diesel Fuel				1	3	4	17%
Fuel Oil			1		2	3	13%
Methanol		1		1		2	9%
Solvent		1			1	2	9%
Petroleum Products	1				1	2	9%
Oil					4	4	17%
Petrochemical				1	2	3	13%
Total	2	3	1	3	14	23	100%
% Distribution	9%	13%	4%	13%	61%	100%	

According to Table 5-8, diesel fuel and oil were the most involved materials in fires during the 5 year period analysed. The greatest number of fires occurred due to the storage of diesel fuel (17%) and oil (17%). The next greatest materials involved with fires were paint (13%) and petrochemical products (13%).

Since the cause of a fire cannot always be determined with certainty, most of the causes were not able to be reported (61%). Table 5-8 shows that the leading two detectable causes of fire were electrical fault and accident, an example of an accident could be impact of mobile equipment with a drum of product. Spillage contributed to 9% of fires and is one of the principal risks found from practical observations in warehouses. Figure 5-3 and Figure 5-4 present the graphical analysis of this study.

Figure 5-3 and Figure 5-4 illustrate the percentage of fire for different material and different causes.

Figure 5-3: Fire percentage for different material

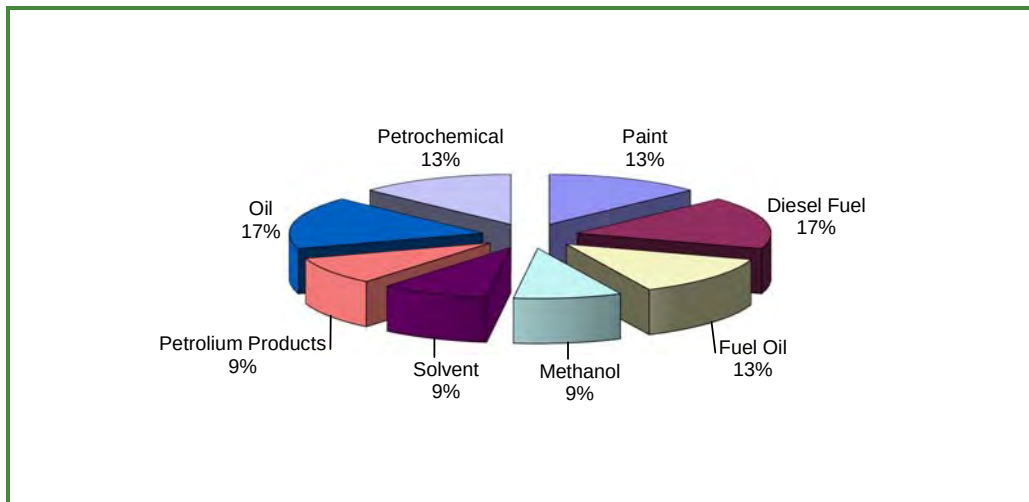
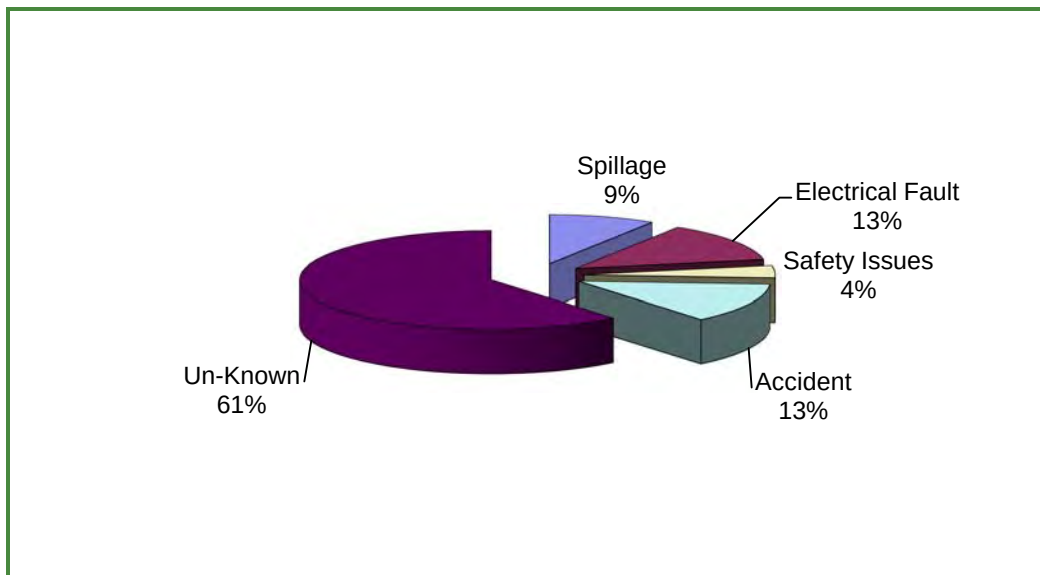


Figure 5-4: Fire Percentage due to different causes



Within industrial settings there are numerous potential sources of ignition with sufficient heat to cause ignition of flammable products. Examples of ignition sources include naked flames, exposed incandescent material, electrical welding arcs, mechanical or static sparks, and electrical, electronic or mechanical equipment not suitable for use in hazardous locations.

Examples of ignition sources and potential issues in their control include:

- Flames.
- Direct fired space and process heating.
- Use of cigarettes/matches.
- Cutting and welding flames.
- Spontaneous heating.
- Friction heating or sparks.
- Impact sparks.
- Sparks from electrical equipment.

- Hot surfaces.
- Space heating equipment.
- Mechanical machinery.
- Electrical equipment and lights.
- Vehicles, unless specially designed or modified are likely to contain a range of potential ignition sources.
- Hot work.
- Filaments from lighting.
- Failure of training in hazardous areas, risks associated with flammable liquids.
- Failure of operator procedures to provide adequate instruction.
- “Emu” policy is endemic in an organisation and management are unwilling to face realities of the weaknesses that exist.
- Stray currents from electrical equipment.
- Electrostatic discharge sparks.
- Lightning strikes.
- Electromagnetic radiation of different wavelengths.
- Static electricity discharges from clothing, transfer of fuels, polythene wrapping (shrink wrapping).
- Forklift trucks.
- Inadequate ventilation control of spillages.
- Failure of induction systems to acquaint contractors with the risks that exist on site.
- Operator enthusiasm for management procedures begins to wain and needs regular reinforcement.

The following precautions should be observed for any storage facility of Class 3 flammable liquids and combustible liquids.

The following minimum safe working procedures need to be followed:

- Tanker connections for acids and alkalis are different sizes. Each connection is also clearly labelled. All pipework is clearly labelled. Plant supervisor present while tanker deliveries of raw material occur.
- A work procedure is in place. Internal audits of use of procedures is in place.
- Flammable and combustible liquids must be stored away from ignition sources (e.g. flames, electrical equipment, grinding and cutting operations) and excessively hot locations;
- All containers must be kept closed when not in use (including containers for waste liquids);
- Any action to open or decant from a container of flammable liquid must be carried out in a well ventilated area and sufficiently distant from any potential ignition source so as to ensure safety having due regard to the quantity being handled;
- Combustible wastes or residues must not be kept or left in areas where flammable or combustible liquids are stored or decanted;
- Materials that might interact dangerously with flammable and combustible liquids must be store separately from them. In particular oxidising agents must be stored separately;
- All people handling flammable and combustible liquids must be familiar with their hazardous properties and the necessary safety procedures for handling them;
- Any spillage must be cleaned up immediately;
- Flammable and combustible liquids must not be stored or used where they may jeopardise escape from a room or building in the event of a fire;
- Where the quantities of flammable liquids stored is greater than minor quantities, a warning sign must be displayed (as illustrated below); and





- Once the quantity of flammable liquids exceeds 10,000 L, hose reels need to have a supply of foam available along with a means of injecting the foam into the water flow. This provides an effective first level of response until the fire brigade attend to the fire.

For the warehouses, lighting has been changed to LEDs which removes the hazard from hot glass released from standard lighting if these are broken or fail.

By restricting access to a designated chemical storage area, by providing bunding to contain the spillage of the chemical and flammable liquids once more than minor quantities are stored i.e. 2500 L of Packing Group III, then a forklift designed to operate in a Zone 1 hazardous area is strongly recommended. Operation of a non-approved forklift in a warehouse where flammable liquids are stored is possible by applying strict work practices but the reliance on these being adhered to presents a weakness that is best avoided.

AS/NZS 3833:2007 allows for mixed Class storage of dangerous goods provided separation between the Classes is practiced. Separate bunding is also provided for liquids of Class 8 to reduce the risk of mixing of Class 3 and Class 8 dangerous goods if a spillage incident should occur.

The chemicals stored are then transferred back onto vehicles licensed to transport dangerous goods as customers require the chemicals.

The length of time each of the packages/IBCs/tote bags containing the chemicals are stored is limited to 1–3 months. Permanent storage over a long time of a particular package is therefore rare. This avoids the deterioration of a package.

These standards and guidelines enable the site to minimise the risk of a hazard occurring and minimise the extent of potential off site impacts. Minimising the offset impacts is achieved through the use of the following engineering features:

- Separation distances to sources of ignition;
- Bunding to prevent spillages flowing outside a designated storage area;
- Separation distances to adjacent premises controlled through the use of 240/240/240 fire rated walls;
- Provision of fire response fire protection with the capability of suppressing spread of a fire; and
- Bunding to contain fire fighting water.

The presence of effective design features is then supported through management and administration controls. These are established through the Emergency Plan specifically prepared for the site.

The GHS Classification places the Class 3 dangerous goods into Categories 2, 3 and 4 as a result of a fire hazard.

5.7.1 Fires Involving Tank Farms

Tank farms involving flammable and combustible liquids that are stored within or near buildings present high levels of fire risk due to the quantity of fuel available for a fire.



A study of the ignition of fires within tank storage areas has shown the following:

- The majority of fires involve flammable liquids where an explosive atmosphere was present and an ignition source ignited the air-gas mixture causing a fire and often an explosion.
- The majority of fires involving combustible liquids on their own are due to ignition sources such as:
 - ▶ Sparks from electrical tools and equipment;
 - ▶ Combustible liquid stains being impacted by a spark from welding or cutting;
 - ▶ A spill making direct contact with an electrical piece of equipment that has inadequate IP protection or should be located away from spill pathways;
 - ▶ Cigarette smoking;
 - ▶ Open flames from oxy-acetylene;
 - ▶ Use of QA test equipment that boils the waste oil or determines presence of contaminants;
 - ▶ Fire occurring in a truck delivering or receiving waste oil; and
 - ▶ Fire occurring off-site and embers enter the roof ventilation.

There are clear indications that the majority of these can be avoided using the following hierarchy of controls:

- Maintain the surfaces of the tanks, pumping equipment and the bunded areas free of oil stains and build-up of oil;
- Induction system for contractors;
- Housekeeping inspections;
- Hot work permit system;
- Emergency plan in place; and
- Trained first response fire crew.

The flashpoint of certain of the liquids is moderate and a strong direct source of heat would be needed to cause vapour to be released that could be ignited.

The following is a useful checklist for the storage facility based on practical experience overseas in regard to liquid storage tanks inside buildings:

- Construction:
Tank construction is of vital importance. It needs to be of welded steel. It requires correctly sized venting to prevent excess pressure causing cracks especially at stress concentration points.

It requires a solid base.

It needs to be able to be isolated with other tanks to limit the spread of leakages; to be able to contain a tank failure; and to limit the spread of a pool fire.

- Occupancy:
The building occupancy is limited to plant personnel.

Offices are isolated by fire rated walls.



An emergency Plan is in place, is effective and is used.

- Fire protection equipment:
The fire protection equipment provides the means for a trained first response fire crew to be well-equipped and effective. Therefore there are three levels of reaction to a fire:
 - (1) Low level first response which is based on extinguishers and foam connected to fire hoses;
 - (2) Medium to high level first response based on hydrants within the building permanently connected to foam applicators;
 - External hydrants
 - Supply of 205 L of foam
 - Trained first response crew
 - Sprinkler system for tank cooling.
 - (3) Life Hazard
 - Offices isolated by FRL walls
 - Emergency plan is in place, is effective and is used.
- Water supply:
Fire engineers would ascertain the Mains supply, whether on-site tanks and fire pumps are required.
- Street conditions:
Considered to be highly advantageous as the site is accessible from two street frontages and Fire and Rescue NSW brigade is minutes away
- Area:
Tanks are separated by intermediary bunding. Tank farm is bunded. Building is bunded.

Cooling water sprinklers added if justifiable.

Site has kerbing and stormwater isolation.

The site as proposed has been designed with emphasis on firstly preventing a fire and then having the means available to achieve the following:

- Minimal to negligible life safety risk;
- Minimal risk of damage to the building;
- No off-site impacts by a potential fire; and
- Containment of fire fighting water using the triple bunding approach of:
 - ▶ Tank farm bunding;
 - ▶ Building bunding; and
 - ▶ Site bunding.

5.7.2 Hazardous Events

The identification of possible hazardous events for this facility has been prepared and a comprehensive list of credible and significant incidents is provided in the form of a Hazard Identification Chart given below.



5.7.2.1 Ignition of Flammable and Combustible Liquids

The ignition of a flammable or combustible liquid is necessary for a fire to erupt. The ignition of such a liquid requires a source of heat that has sufficient energy to exceed the flash point of the liquid. The flash point is determined by a method that includes heating the liquid in a cup and a gas pilot is enabled to cause a flash of flame just above the surface of the liquid. The fire point is a slightly higher temperature and at this temperature the fire on the surface will be sustained. The liquid also needs to be present in a vapour mixture with air that is sufficiently rich in presence of the flammable liquid that ignition may occur.

The flammable liquid may be heated to a temperature, in the absence of a source of ignition, where a spontaneous ignition occurs.

The range of concentrations of flammable liquids that are too lean or too rich to enable ignition to occur are described as the Lower Explosive Limit (LEL) and Upper Explosive Limit (UEL). Between these two limits there are a wide range of concentrations that could be expected to occur where ignition could occur in the presence of an ignition source.

The presence of a source of ignition with enough heat to ignite a vapour concentration, between the LEL and UEL only needs to have a minute mass of flammable liquid presence to cause the initial fire and subsequently the release of sufficient energy to heat larger masses of the flammable liquid occurs spontaneously. The spread of a fire is rapid and once initiated rapid early response is critical if the fire is to be contained.

The release of a flammable liquid from its container or IBC will cause pooling of this liquid. The physical dimensions of the pool of liquid correlates to the size of the fire.

Spill area can be determined from the container volumes expected to be involved. The growth of the fire will be dependent on the rate at which the initial ignition is able to further heat the surface of the pool. Denying the vapour to the fire during the critical first response period would have greatest potential to suppress the spread of the fire.

The rate of the spread of a fire has been conservatively estimated at 0.2 m/sec in the gas phase above the surface of the liquid. A typical flame velocity in the liquid is 2 m/sec. Examples are quoted (*SFPE Handbook of Fire Protection Engineering, 3rd Edition*) of a 6 m diameter pool of petrol requiring 3 secs for fuel involvement at an ambient temperature of 20°C. Diesel with its much higher flash point would typically require 61 secs.

An extensive research study of fires involving IBC's conducted by the UK HSE found that ignition of flammable liquids from a pile of newspaper placed beneath the weak point in the current design of IBC's being the plastic outlet valve, can occur within 75 seconds for a flammable liquid (based on using IPA-isopropyl alcohol) in the tests and no leakage for diesel except when a gas match was used.

The IBC's usually experience large splits in the walls of the IBC's and spillage occurs at a rate between 9 kg/sec – 25 kg/sec.

The pool size can rapidly occupy a 45-60 square metre area. A pool fire within the B1 or B2 warehouses would be contained by the fire rated walls.



These times of a fire spreading would be beyond the reaction time of most warehouse operators.

The provision of first response means to engulf a fire with either foam or powder from a fire extinguisher or foam from a hose reel are useful fire control methods until the fire brigade are able to attend to the situation and have been shown by testing conducted by FM Global research to be very effective.

The warehouses B1 and B2 are not of a sufficient size to require fire sprinklers.

5.7.2.2 Hazard Identification Chart

A Hazard Identification Chart has been prepared for the proposed site based on operating scenarios that are relevant to the proposed development. This chart outlines the outcomes from the hazard identification phase of the assessment.

The chart consists of four columns:

Column 1

Heading: Functional/Operation Area
The area of the site involved with the potential event is listed.

Column 2

Heading: Possible Initiating Event
The individual events that are considered to be likely or realistic are then listed. Where the possible consequences are similar the events are listed together, each one individually numbered.

Column 3

Heading: Possible Consequences
The outcomes of an event if it occurred are listed.

Column 4

Heading: Prevention/Protection Measures
The measures designed into the functional/operation area and the site are listed. These measures may include for example safeguards, design features, management methods and/or operator training.

The hazard identification chart is presented in Table 5-9.



Table 5-9: Event/Consequence Analysis Table

Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
1. Warehouse “B1” or “B2”	• Spill of quantity of solvent or hydrocarbon from a 205 L drum or IBC. • Quantity of spill could vary from being minor e.g. 5–20 L, moderate 20 L–50 L, or major >100 L. • Spill causes fire if vapour comes into contact with an ignition source. • Full scale flammable liquids store fire. • Drum or IBC pierced by forklift. • Drum or IBC falls off forklift tynes and splits open. • IBC damaged during transport i.e. valve is knocked and begins to leak slowly.	• Spill occurs during unloading and outside the flammable liquids store. Spill is immediately detected and cleaned up without an incident. • Spill escapes to stormwater; stormwater isolation put into effect following the site’s spill control procedure. • Spilt liquid is ignited resulting in fire and/or explosion. • Fire engulfs transport truck. • Spill occurs within flammable liquid store. Spill is immediately detected and cleaned up without an incident. • No ignition of the flammable vapour occurs as flammable liquid store is a hazardous zoned area.	• Procedures, facilities and absorbent materials for spillage control are maintained on site. • All employees are trained and experienced in the spill control procedures. • Presence of a first response Redox fire team on site. • These employees are in regular attendance and spill control can be immediately implemented. • Hose reels near and inside the flammable liquids store are provided with foam so that spill area can be covered with foam to suppress evaporation of liquid. • Site stormwater system able to be isolated. • If the event occurred within the flammable liquid store, this store is separated from on-site protected areas and off-site protected places in accordance with distances in AS 1940–2017 and has 240/240/240 walls and 180/180/180 roof. • Product packaging for deliveries comply with the specifications of the ADG Code. • Forklift truck drivers are specifically trained in the handling of dangerous goods. • The chemical storage area is considered to be a Zone II hazardous area. A forklift designed for use in a hazardous area would be used.



Table 5-9: Event/Consequence Analysis Table

Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
2. Warehouse "B1" or "B2"	Drum or IBC leaks while stored.	- Leak goes unnoticed and finds a source of ignition resulting in a pool or running fire in the store. - Fire spreads to involve all stored material. Pool fire can develop to involve whole bund. - Radiation from pool fire causes heating of adjacent drum store causing spread of fire. - Fire spreads to general office building.	- Roofed drum store is bunded. - Roofed drum store is equipped with electrical equipment as per hazardous zoning requirements. - Roofed drum store is ventilated. - Procedures and facilities for spillage control are maintained on-site. - Hot work permit system operates on-site. - Smoking is not permitted on the site in exception to the designated lunch area in the administration area. - Store is separated from general office and other dangerous goods by adequate separation distances in accordance with AS 1940-2017 and AS/NZS 3833:2007. - Trained emergency response/fire team is on stand-by during working hours to provide first response to emergencies. - Forklift rated for hazardous areas used in the chemical storage area. - Fire hydrants, hose reels and fire extinguishers are located in the vicinity of the warehouse. Hose reels have foam injection kits.



Table 5-9: Event/Consequence Analysis Table

Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
3. External area	- Drum or IBC of flammable liquid falls off pallet while being handled by a forklift truck and leaks/bursts. - Drum or IBC of flammable liquid pierced by forklift tyre while being handled.	- Spill finds a source of ignition resulting in a pool or running fire in the yard. - Spill enters stormwater system. - Evaporation of spilt solvent occurs resulting in gaseous emissions.	- Drums and IBCs comply with and are selected in accordance with ADGC requirements. - Operators are present during all these handling activities. - Area is out doors and well ventilated. - Appropriate fire fighting equipment is available for use across the site. - Hot work permit system operates on-site. - Procedures and facilities for spillage control are maintained on-site – hydrocarbon spill kit. - Absorbent material is kept near unloading area. - Trained emergency response/fire team is on stand-by during working hours to provide first response to emergencies. An emergency plan exists.
4. Unloading Areas	Leak during goods movement.	- Spillage contained in bunded site. - Spill enters stormwater drain(s). - Vapour from bund contents finds a source of ignition and a pool fire develops in the bund. - Radiation from pool fire causes heating of adjacent areas, thus spreading the fire. - Toxic vapours / clouds are formed due to evaporating pool or pool fire.	- The site would be protected via hose reels, hydrants and fire extinguishers and are installed and maintained in accordance with the relevant Australian Standards. - Spill kits are readily available for treatment of spills - Site induction is established on site for employees and visitors, which would address matters on safety, hazards, and procedures to adhere with on site. - Appropriate emergency procedures are available for the site and all staff will be trained in the appropriate emergency procedures - The unloading area has sufficient separation distances from existing nearby properties and structures to prevent the spread of fire. - Transfer operations would be supervised at all times.



Table 5-9: Event/Consequence Analysis Table

Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
5. Loading Out Areas	Packaging damage during product transfer.	- Spill of material. - Material escapes to stormwater. - Spilt material forms vapour. - Vapour impacts on employee's personal health and safety. - Material finds an ignition source resulting in a fire.	- All product transfer operations are supervised by experienced operators trained in safe operating procedures. - No materials are stored in bulk. - Spill control equipment is provided near the loading out area. Employees are in regular attendance to implement spill control procedures. - Strict control of ignition sources including a hot work permit system will operate. No smoking will be permitted in the loading dock area. - Fire services are located near the loading out area. - Emergency evacuation plan and emergency response plan involve adjoining warehouse occupants are implemented.
6. Tanker unloading or loading	- Failure of a pump bearing causes excess heat. - Failure of an electrical motor causes a fire. - Failure of a pipe/hose fitting releases a mist which is ignited by a hot surface.	- Fire at the road tanker, substantial fuel available. Heat exposes tanks to sufficient heat to cause tank rupture. Pool fire spreads - Fire within the bunded tanks' area. Pool fire spreads within the bunded area, tank ruptures, contents continue to fuel confined pool fire.	- Operators always present during the tanker unloading/loading process. - Preventative maintenance programme. - First response fire services available. - Operators trained in use of these services. - Tanker unloading area has drive over ramps that confine the pool fire. - Fire services provide immediate access to foam to rapidly dimension intensity of fire. - Fire in a tank storage area is confined with limited immediate opportunity to damage the building due to the presence of fire rated walls. - Site has stormwater/fire fighting water isolation. - Emergency plan in place.



Table 5-9: Event/Consequence Analysis Table

Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
	Oil leakages collect at the tanker unloading/loading area and splash onto the hot exhaust of the truck engine.	Fire with sufficient fuel available to cause rapid spread of fire to the tanker and subsequent heat of radiation causes fire in tank storage area.	- Preventative maintenance programme. - Routine cleaning of tanker area. - Oil leakages promptly attended to. - Site always occupied when trucks are on site. - Tanker parking area is bunded to prevent spread of a pool fire. - Foam available with hose reels or at a hydrant foam dispensing unit to provide an immediate first response. - Emergency plan in place.
7. Tank storage area fire	Hot work ignites oil spilt in bund or ignites surface of oil in a tank.	Tank storage area engulfed.	- Hotwork permit system in place. - Operators have access to first response fire services. - Tanks are separated into sets rather than one large tank farm to reduce potential for a large pool fire. - Emergency Plan in place.
	Fire from other sites causes release of tinders	Tinders make contact with surface of a tank and cause ignition.	- Operators have access to first response fire services. - Tanks kept free of oil stains. - Bunds kept free of oil leakages.
	Fire in adjacent premises impinges on building	Tanks heated to above flash point and ignite.	- Operators have access to first response fire services. - Several hydrants provided on site.
	Arsonists use accelerant to cause fire	Tank farm engulfed.	Building under security surveillance so presence of smoke would be detected.



Table 5-9: Event/Consequence Analysis Table

Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
	Tank overfilled and loss of containment due to bund leaking. Leaking oil finds source of heat and ignites.	Pool fire on site.	- Tanks have level indication and alarms for high level. - Operators present during tanker unloading. - Bunding made from reinforced concrete. - Site infrastructure routinely inspected. - Emergency Plan in place. - Tank level indicators and fill point alarms checked every six months onto a preventative maintenance log. - Internal inspection of the integrity of the tanks to schedule advised in AS 1940. - Tank overfilling limited by the maximum quantity stored in a compartment of the road tanker ~5,000 L.
8. Explosion “within” a tank.	Tank exposed to high levels of heat of radiation. Oil begins to boil and releases highly flammable vapour. Vapour ignites and causes boiling oil to also ignite generating an explosion.	Tank explodes and causes structural damage to the bund wall and fire rated wall. Pool fire spreads outside of bunded area and flows towards the site stormwater isolation valve.	- Tanks are located in a bund with fire rated walls on three sides. Direction of flames impinging on the surface of a tank confined as to the direction that is available. Separation to external sources of heat are very effective in reducing heat of radiation on the surface of the tank. - Site has three hydrants with substantial water flow that can be used to apply cooling water to the tanks. - Site has a trained first response fire crew.
9. Fire within the offices or warehouse building	Tank exposed to high levels of heat of radiation leading to either the oil boiling or a rupture of the tank.	A pool fire forms in the bunded area or away from the tank due to massive failure of the tank.	- Tank storage areas are designed with fire rated walls between the bunded area and the building providing a “two way” fire protection system. - Three double hydrants provided on site with high flow rates. - Trained first response fire crew on site.



Table 5-9: Event/Consequence Analysis Table

Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
10.Stage IV Facility staging area	• Drum or IBC overfilled. • Drum or IBC impacted by forklift tyres	• Leak goes unnoticed and finds a source of ignition, pool fire erupts and envelops the facility. • Radiation from pool fire causes excessive heat on the surface of the mixing tanks and larger fire erupts • Fire spreads across the facility.	• Areas are designed as a Zone II hazardous area. • Staging area permanently manned. • Hydrocarbon spill kits in this area. • Hose reels have foam so spill kits can be protected from ignition. • Procedures for spill control in place. • Operators are trained. • Majority of product in drums and IBC's has been diluted and is a low risk of ignition. • Area is protected by fire rated walls to limit spread of a fire.
11.Stage IV mixing area	• Failure of a disperser motor bearing causes excess heat. • Failure of a disperser motor causes a fire. • Failure of a pipe/hose fitting releases flammable vapour mist which is ignited by a hot surface.	• Fire within the mixing vessel. • Fire within the bund of the mixing vessel. • Fire outside the mixing vessel.	• Operators always present. • Area under CCTV viewing from the control room. • Preventative maintenance programme. • Separate bunding provided for mixing vessels and bulk tanks so that pool fire is confined. • Bulk storage tanks used for Class 8(3) chemicals are provided with cooling water in accordance with AS 1940. • Presence of fire rated walls. • Foam available with hose reels. • Operators trained in the use of fire extinguishers and foam.



Table 5-9: Event/Consequence Analysis Table

Functional/ Operational Area	Possible Initiating Event	Possible Consequences	Prevention/Protection Measures
12. Stage IV Facility	Human Errors	- High level ignored and a tank is overfilled. - Chemical added to an empty diluting/decanting tank and then water is added, generating steam and chemical splashes out of the tank. - Incompatible chemicals added to a bulk tank.	- Training - Procedures



5.7.3 Hazard Identified for Further Analysis

Given the information listed in Table 5-9, the potential hazards identified for further analysis have been analysed in a scenario based risk assessment.

The hazards that were analysed for off-site impacts are separated into the B1/B2 warehouses and the Stage IV facility.

The B1/B2 warehouses were analysed for fire to justify the use of “bulk” storage where bulk is a container of volume larger than 450 kg and implies the use of IBC’s within these warehouses and not storage in tanks.

The fire may commence involving a small quantity of flammable liquid and engulf several IBC’s as the fire safety study has shown that these are very vulnerable to failing during exposure to a pool fire.

Although warehouses B1/B2 are existing and have 240/240/240 fire rated walls and a 180/180/180 fire rated roof, required because of the risk of non-relieving drums having the potential to “BLEVE”, the justification for storage in bulk (i.e. IBC’s) requires this analysis.

The scenarios analysed assume the fire burns longer than 180 minutes (i.e. 3 hours) and the flame height is no longer constrained by the roof.

The presence of the fire rated walls is included in the modelling of heat of radiation levels as it would not be a credible or scientifically based analysis (regardless of whether this is in disagreement with reviewers of this PHA).

The fire was allowed to expand consuming 30,000 kg and then the total contents of the warehouse being 600,000 kg.

No analysis of incomplete combustion was undertaken at B1/B2 warehouses but was conducted at the Stage IV facility for a large number of possible scenarios.

The Stage IV facility presents several complications as this facility involved numerous operations that increase the level or risk when compared to the basic operations of warehousing.

The storage of three chemicals that are flammable and one that is combustible requires detailed assessment of several hazards.

- A fire could be initiated from a leakage/spill from a bulk tank containing acetic, formic or citric acids.

The flash point of acetic acid is equivalent to a flammable liquid with Packing Group II or GHS Category 2 and therefore is readily ignitable.

Although hazardous area zoning would remove ignition sources from process equipment, a malfunction that generates heat or an error of judgement could introduce a source of ignition, the potential for a fire to engulf the contents of a bulk storage tank is credible.



As this fire could then engulf the bulk storage tank of formic acid, the intensity of the fire could expose the storage tanks of alkali to sufficient heat to cause these chemicals to decompose.

The findings from the heat of radiation levels have influenced the design of the facility to isolate heat and, as will be evident from the recommendations, include adequate fire protection and cooling water to prevent/minimise the likelihood of these events causing off site hazards.

From the ongoing research of lessons learnt and events causing fire, the scenarios of a compartment of a road tanker spilling and being ignited was analysed.

The total contents of a tanker could then be engulfed and this was assessed.

- Due to the topography of the site being down gradient of potentially sensitive receivers, an air dispersion model that has greater capability than Ausplume to consider steep terrain was used to calculate ground level concentrations from a fire undergoing incomplete combustion.

Each of the major fires was assessed using combustion characteristics of acetic acid and formic acid.

- Acetic and formic acid have pungent odours and low vapour pressures indicating that these would readily be evaporated.

Releases from confined spillages were assessed. Extensive use of bunding is designed into the facility for several reasons related to compliance with Australian Standards, our Regulatory Authorities and best practice.

The size of the spillages would usually be expected to be very limited due to the management system that would be in place. However several larger spillage events were assessed for ground level concentrations. This tests the sensitivity of the PHA to evaluate worse than expected events. No chlorine gas is present in the chemicals being stored and processed so release of chlorine gas has not needed to be considered.

This depth of analysis guides adopting design features that ensure the level of effectiveness is adequate.

The design features are especially relevant to reducing the outcomes of events that arise because of the “human factor”. The quantities selected for analysis are credible and extend from minor fires involving several pallets of product to the maximum event credible.

Class 8 corrosive dangerous goods have limited potential for off-site harm provided that appropriate controls are implemented. Incompatible chemicals would be stored and banded separately, reducing the likelihood and consequence of spills and the incompatible mixing of chemicals.

The hazardous scenarios identified for further analysis are described below:



B1 & B2 Area

- Scenario 1 Fire involving 5,000 kg of flammable liquid ignited within the warehouse B1/B2 – contour provided.
- Scenario 2 Fire involving 30,000 kg of flammable liquid ignited within the warehouse B1/B2 – contour provided.
- Scenario 3 Fire involving 600,000 kg of flammable liquid ignited within the warehouse B1/B2 – contour provided.

Stage IV Facility

- Scenario 4 Fire involving 100 kg of Class 8(3) flammable liquid at the Stage IV facility.
- Scenario 5 Fire involving 3,000 kg of Class 8(3) flammable liquid at the Stage IV facility – contour provided.
- Scenario 6 Fire involving 10,000 kg of Class 8(3) flammable liquid at the Stage IV facility – contour provided.
- Scenario 7 Fire involving 30,000 kg of Class 8(3) flammable liquid at the Stage IV facility – contour provided.
- Scenario 8 Fire involving 100 kg of acetic acid in a 2 m² pool area – no contour provided
- Scenario 9 Ground level concentrations from a fire involving 5,000 kg of acetic acid in a 30 m² pool area – contour provided
- Scenario 10 Ground level concentrations from a fire involving 30,000 kg of acetic acid in a 30 m² pool area – contour provided.
- Scenario 11 Ground level concentrations from a fire involving 5,000 kg of acetic acid in a 120 m² pool area – contour provided.
- Scenario 12 Ground level concentrations from a fire involving 30,000 kg of acetic acid in a 120 m² pool area – contour provided.
- Scenario 13 Ground level concentrations from a fire involving 100 kg of formic acid in a 2 m² pool area.
- Scenario 14 Ground level concentrations from a fire involving 5,000 kg of formic acid in a 30 m² pool area.
- Scenario 15 Ground level concentrations from a fire involving 30,000 kg of formic acid in a 30 m² pool area.
- Scenario 16 Ground level concentrations from a fire involving 5,000 kg of formic acid in a 120 m² pool area.
- Scenario 17 Ground level concentrations from a fire involving 30,000 kg of formic acid in a 120 m² pool area.
- Scenario 18 Ground level concentrations from a spill of 100 kg of acetic acid in a 2 m² pool area.
- Scenario 19 Ground level concentrations from a spill of 5,000 kg of acetic acid in a 30 m² pool area.
- Scenario 20 Ground level concentrations from a spill of 100 kg of formic acid in a 2 m² pool area.
- Scenario 21 Ground level concentrations from a spill of 5,000 kg of formic acid in a 30 m² pool area.

Further detailed assessments of each of these areas have been provided in the following section.

5.8 CONSEQUENCE ANALYSIS – HEAT RADIATION

The heat radiation modelling was undertaken using both TNO Effects (Version 7.6) and modelling using the view factor where a fire rated wall was present. TNO Effects is a modelling software developed by TNO Built Environment and Geoscience, situated in the Netherlands. The software is able to predict both physical effects and consequences of a specific incident from the proposed development.

TNO Effects was used to obtain heat radiation contours based on combustion rates of the materials involved. The chemical data within the program is limited so xylene was used for the heat of radiation calculations at B1/B2. For the Stage IV facility, acetic and formic acids are included in the software. The radiation contours obtained from TNO Effects were mapped from the perimeter of the source area.

5.8.1 Scenario 1: Fire involving 5,000 kg of Class 3 flammable liquids at B1/B2

This scenario describes the event that a bund fire has occurred involving the combustion of 5,000 kg of flammable liquids within either warehouse.

The following calculations and assumptions were considered in the modelling of effects using TNO Effects:

- 5,000 kg of xylene was assumed to be involved in the fire;
- The pool fire surface area was the floor of either warehouse;
- A calculated combustion rate was used from TNO Effects;
- Ambient weather conditions at Minto; and
- Control measures in place consisting of fire-rated walls and the roof is collapsed.

The heat radiation distances obtained are presented in Table 5-10, Figure 5-5 and Figure 5-6 respectively.

Table 5-10: Heat Radiation Distances for Scenario 1

Level	Heat Radiation Distance from Fire Boundary (m)
4.7 kW/m ²	38.9
12.6 kW/m ²	17.7
23 kW/m ²	7.7
35 kW/m ²	1.5

Comment:

The heat of radiation levels are contained within the warehouse area.

Figure 5-5: Heat Radiation Contours for Scenario 1: Pool fire involving 5,000 kg of Class 3 flammable liquids in B1



Note: Isopleths illustrate the heat of radiation contours: Yellow = 4.7 kW/m^2 ; Orange = 12.6 kW/m^2 ; Blue = 23 kW/m^2 ; Red = 35 kW/m^2 .
The surface area remains constant for both 5 000 kg and 30 000 kg therefore the heat contours are identical.

Figure 5-6: Heat Radiation Contours for Scenario 1: Pool fire involving 5,000 kg of Class 3 flammable liquids in B2



Note: Isopleths illustrate the heat of radiation contours: Yellow = 4.7 kW/m^2 ; Orange = 12.6 kW/m^2 , Blue = 23 kW/m^2 Red = 35 kW/m^2 .
The surface area remains constant for both 5 000 kg and 30 000 kg therefore the heat contours are identical.



5.8.2 Scenario 2: Fire involving 30,000 kg of Class 3 flammable liquids at B1/B2

This scenario describes the event that the previous pool fire (Scenario 1) has caused further IBCs to fail and a larger fire develops involving the combustion of the maximum storage amount of Class 3 PGIII flammable liquids (30,000 kg) within the chemical storage area. This scenario generates similar heat of radiation levels and contours as the burning rate is the same.

The following calculations and assumptions were considered in the modelling:

- 30,000 kg of xylene was assumed to be involved in the fire;
- The pool fire surface area was the floor of either warehouse;
- A calculated combustion rate from TNO Effects;
- Ambient weather conditions at Minto; and
- Control measures in place consisting of fire-rated walls, roof collapsed.

The heat radiation distances obtained are presented in Table 5-11, Figure 5-7 and Figure 5-8.

Table 5-11: Heat Radiation Distances for Scenario 2

Level	Heat Radiation Distance from Fire Boundary (m)
4.7 kW/m ²	38.9
12.6 kW/m ²	17.7
23 kW/m ²	7.7
35 kW/m ²	1.5

The heat of radiation levels are contained within the warehouse area.

Figure 5-7: Heat Radiation Contours for Scenario 2: Pool fire involving 30,000 kg of Class 3 flammable liquids in B1



Note: Isopleths illustrate the heat of radiation contours: Yellow = 4.7 kW/m^2 ; Orange = 12.6 kW/m^2 , Blue = 23 kW/m^2 , Red = 35 kW/m^2 .
The surface area remains constant for both 5 000 kg and 30 000 kg therefore the heat contours are identical.

Figure 5-8: Heat Radiation Contours for Scenario 2: Pool fire involving 30,000 kg of Class 3 flammable liquids in B2



Note: Isopleths illustrate the heat of radiation contours: Yellow = 4.7 kW/m^2 ; Orange = 12.6 kW/m^2 , Blue = 23 kW/m^2 Red = 35 kW/m^2 .
The surface area remains constant for both 5 000 kg and 30 000 kg therefore the heat contours are identical.

5.8.3 Scenario 3: Fire involving 600,000 kg of Class 3 flammable liquids at B1/B2

This scenario assumes that the previous fire has not been able to be contained and the maximum storage amount that could be contained is involved.

This scenario describes the event that a large fire had occurred involving the combustion of the maximum storage amount of Class 3 PGIII flammable liquids within either warehouse.

The following calculations and assumptions were considered in the modelling of effects:

- 600,000 kg of xylene was assumed to be involved in the fire;
- The pool fire surface area was the floor of either warehouse;
- A calculated combustion rate was used from TNO Effects;
- Ambient weather conditions at Minto; and
- Control measures in place consisting of fire-rated walls, roof collapsed.

The heat radiation distances obtained are presented in Table 5-12 and Figure 5-9 respectively.

Table 5-12: Heat Radiation Distances for Scenario 3

Level	Heat Radiation Distance from Fire Boundary (m)
4.7 kW/m ²	50
12.6 kW/m ²	23.8
23 kW/m ²	11.4
35 kW/m ²	3.5

Comment:

The heat of radiation levels are contained within the warehouse area. Structural damage would not be expected to be extensive due to the presence of the 240/240/240 fire rated walls.

Figure 5-9: Heat Radiation Contours for Scenario 3: Bund fire involving 600,000 kg of Class 3 flammable liquids



Note: Isopleths illustrate the heat of radiation contours: Yellow = 4.7 kW/m^2 ; Orange = 12.6 kW/m^2 ; Blue = 23 kW/m^2 ; Red = 35 kW/m^2 .

This fire is the maximum possible as it assumes all the contents able to be stored would be ignited.

The following scenarios occur at the Stage IV facility.

5.8.4 Scenario 4: Fire involving 100 kg of Class 8(3) liquids

This scenario describes the event that a very small fire occurs within any area of the facility involving the combustion of 100 kg of Class 3 PGIII flammable liquids. It is likely the fire has erupted due to a small spillage of liquid.

The following calculations and assumptions were considered in the modelling of effects:

- 100 kg of xylene was assumed to be involved in the fire;
- The pool fire surface area was calculated to be 2 m² based on the spill occurring in a bunded area;
- A calculated combustion rate was used from TNO Effects;
- Ambient weather conditions at Minto; and
- No control measures in place such as fire-rated walls and fire-fighting equipment and devices.

The heat radiation distances obtained are presented in Table 5-13.

Table 5-13: Heat Radiation Distances for Scenario 4

Level	Heat Radiation Distance from Fire Boundary (m)
4.7 kW/m ²	5.0
12.6 kW/m ²	4.3
23 kW/m ²	4.3

Comment:

The heat of radiation levels would not reach the control office and there would be no structural damage.



5.8.5 Scenario 5: Fire involving 3,000 kg of Class 8(3) liquids

This scenario describes the event that a large fire had occurred involving the combustion of a larger amount of flammable liquids to show how far the heat of radiation contours would extend and cause damage to tanks and potentially cause the fire to spread.

The following calculations and assumptions were considered in the modelling of effects using TNO Effects:

- 3,000 kg of xylene was assumed to be involved in the fire;
- The pool fire surface area was estimated to be based on the area of the building as a worst case scenario¹;
- A calculated combustion rate was used from TNO Effects;
- Ambient weather conditions at Minto; and
- No control measures in place such as fire-rated walls and fire-fighting equipment and devices.

The heat radiation distances obtained are presented in Table 5-14 and Figure 5-10 respectively.

Table 5-14: Heat Radiation Distances for Scenario 5

Level	Heat Radiation Distance from Fire Boundary (m)
4.7 kW/m ²	66.7
12.6 kW/m ²	46.8
23 kW/m ²	36.5
35 kW/m ²	28.7

Comment:

The heat of radiation levels based on these assumptions could expose adjoining areas of the Stage IV facility to heat that would cause tanks to fail and the building structure to collapse.

Prevention of structural damage to adjoining properties would rely on fire fighting water directed by Fire Officers.

A recommendation is included that requires cooling water to be placed above the Class 8(3) tanks.

¹ The bunded areas within the warehouse boundary are built with a gradual gradation on the side facing the points of vehicular access. The gradation ceases a distance from those points so product cannot be spilled beyond the warehouse. Using the larger surface area of the building provided a worst case scenario regarding heat of radiation impacts.

Figure 5-10: Heat Radiation Contours for Scenario 5: Fire involving 3,000 kg of Class 8(3) liquids



Note: Isopleths illustrate the heat of radiation contours: Yellow = 4.7 kW/m^2 ; Orange = 12.6 kW/m^2 ; Blue = 23 kW/m^2 ; Red = 35 kW/m^2 .
The surface area remains constant for 3000 kg, 10000 kg and 30000 kg therefore the heat contours are identical.



5.8.6 Scenario 6: Fire involving 10,000 kg of Class 8(3) liquids

This scenario accepts that the fire has not been contained and has caused a bulk tank to fail or involved compartments of a road tanker.

The following calculations and assumptions were considered in the modelling of effects using TNO Effects:

- 10,000 kg of xylene was assumed to be involved in the fire;
- The pool fire surface area was estimated to be based on the area of the building as a worst case scenario¹;
- A calculated combustion rate was used from TNO Effects;
- Ambient weather conditions at Minto; and
- No control measures in place such as fire-rated walls and fire-fighting equipment and devices.

The heat radiation distances obtained are presented in Table 5-15 and Figure 5-11 respectively.

Table 5-15: Heat Radiation Distances for Scenario 6

Level	Heat Radiation Distance from Fire Boundary (m)
4.7 kW/m ²	66.7
12.6 kW/m ²	46.8
23 kW/m ²	36.5
35 kW/m ²	28.7

Comments:

The heat of radiation levels based on these assumptions could expose adjoining areas of the Stage IV facility to heat that would cause tanks to fail and the building structure to collapse.

Prevention of structural damage to adjoining properties would rely on fire fighting water directed by Fire Officers.

A recommendation is included that requires cooling water to be placed above the Class 8(3) tanks.

¹ The bunded areas within the warehouse boundary are built with a gradual gradation on the side facing the points of vehicular access. The gradation ceases a distance from those points so product cannot be spilled beyond the warehouse. Using the larger surface area of the building provided a worst case scenario regarding heat of radiation impacts.

Figure 5-11: Heat Radiation Contours for Scenario 6: Fire involving 10,000 kg of Class 8(3) liquids



Note: Isopleths illustrate the heat of radiation contours: Yellow = 4.7 kW/m^2 ; Orange = 12.6 kW/m^2 , Blue = 23 kW/m^2 , Red = 35 kW/m^2 .
The surface area remains constant for 3000 kg, 10000 kg and 30000 kg therefore the heat contours are identical.



5.8.7 Scenario 7: Fire involving 30,000 kg of Class 8(3) liquid

This scenario assumes that the whole of a bulk storage tank or a road tanker is involved.

The following calculations and assumptions were considered in the modelling of effects using TNO Effects:

- 30,000 kg of xylene was assumed to be involved in the fire;
- The pool fire surface area was estimated to be based on the area of the building as a worst case scenario¹;
- A calculated combustion rate was used from TNO Effects;
- Ambient weather conditions at Minto; and
- No control measures in place such as fire-rated walls and fire-fighting equipment and devices.

The heat radiation distances obtained are presented in Table 5-16 and Figure 5-12 respectively.

Table 5-16: Heat Radiation Distances for Scenario 7

Level	Heat Radiation Distance from Fire Boundary (m)
4.7 kW/m ²	66.7
12.6 kW/m ²	46.8
23 kW/m ²	36.5
35 kW/m ²	28.7

Comment:

The heat of radiation levels based on these assumptions could expose adjoining areas of the Stage IV facility to heat that would cause tanks to fail and the building structure to collapse.

Prevention of structural damage to adjoining properties would rely on fire fighting water directed by Fire Officers.

A recommendation is included that requires cooling water to be placed above the Class 8(3) tanks.

¹The bunded areas within the warehouse boundary are built with a gradual gradation on the side facing the points of vehicular access. The gradation ceases a distance from those points so product cannot be spilled beyond the warehouse. Using the larger surface area of the building provided a worst case scenario regarding heat of radiation impacts.

Figure 5-12: Heat Radiation Distances for Scenario 7: Fire involving 30,000 kg of Class 8(3) liquid



Note: Isopleths illustrate the heat of radiation contours: Yellow = 4.7 kW/m^2 ; Orange = 12.6 kW/m^2 , Blue = 23 kW/m^2 Red = 35 kW/m^2 .
The surface area remains constant for 3000 kg, 10000 kg and 30000 kg therefore the heat contours are identical.



5.9 CONSEQUENCE ANALYSIS – TOXIC COMBUSTION PRODUCT EMISSIONS

The new generation air dispersion model, AERMOD was used for the prediction of off-site impacts associated with the air emissions from the proposed operations. AERMOD uses air dispersion based on planetary boundary layer turbulence structure and scaling concepts. The AERMOD model replaced AUSPLUME as the air dispersion model accepted by the Victorian EPA in January 2014 and is accepted by the NSW EPA for air and odour assessments.

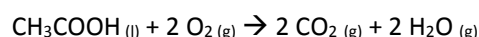
The nearest weather monitoring station within proximity to the subject site is the Campbelltown AWS operated by the Bureau of Meteorology. This monitoring station is located approximately 7.5 kilometres away to the south of the subject site and was considered to be the most appropriate due to the vicinity, completeness and latest data available to carry out dispersion modelling. Weather data for the year 2015 was obtained. For the purpose of inclusion in the air dispersion model a meteorological file using 2015 as the base year was generated by Air Quality Professionals Pty Ltd as a site-representative meteorological file for use in the assessment.

Flammable substances such as acetic acid and formic acid would consist of hydrocarbon, which would burn into carbon dioxide and water vapour in the event of complete combustion due to fire. Incomplete combustion would occur when the amount of oxygen in the air becomes insufficient compared to the hydrocarbon. When this occurs, smoke would be generated due to formation of toxic carbon monoxide.

5.9.1 Complete Combustion

Acetic Acid:

Complete combustion of acetic acid would follow the stoichiometric equation below:



For a complete combustion 2 moles of oxygen would be required per mole of acetic acid. To determine whether a fire event would likely to undergo complete combustion, the amount of oxygen available in the warehouse was determined below.

Assuming 10.455 m roof height at the peak (h_1) and 8.5 m to the top of the walls (h_2), and the area of the warehouse is 1253 m², the warehouse volume is:

$$V = Ah_1 + \frac{Ah_2}{3} = 11,467 \text{ m}^3$$

The volume of air would be approximately equal to warehouse volume. Assuming ideal gas under standard temperature and pressure

$$PV = nRT$$

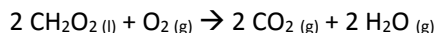
$$n = \frac{(101,325 \text{ Pa})(11,467 \text{ m}^3)}{(8.314)(298 \text{ K})} = 4.69 \times 10^5 \text{ moles}$$



Air consist of approximately 21% oxygen, therefore oxygen content in the warehouse would be 9.85×10^4 moles. This would be enough to completely react with 49,250 moles of acetic acid, equating to 2957 kg of spill.

Formic Acid:

Complete combustion of formic acid would follow the stoichiometric equation below:



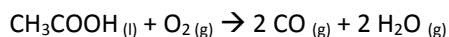
For a complete combustion 1 mole of oxygen would be required for every 2 moles of formic acid. To determine whether a fire event would likely to undergo complete combustion, the amount of oxygen available in the warehouse as calculated above was used.

9.85×10^4 moles of oxygen in the warehouse would be enough to completely react with 197,000 moles of acetic acid, equating to 9068 kg of spill.

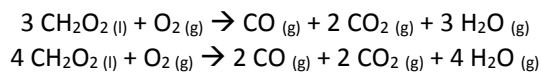
5.9.2 Incomplete Combustion

When the amount of oxygen becomes insufficient, other combustion products such as carbon monoxide, oxides of nitrogen, carbon (soot), and other hydrocarbon derivatives would be formed. Amongst all these products, toxic carbon monoxide smoke would likely be most selective according to various stoichiometric ratios. Examples of incomplete combustion would be:

Acetic acid:



Formic acid:



To account for the worst case scenario, the following ratios were considered applicable:

- For acetic acid, a ratio of 2 carbon monoxide formed per mole of acetic acid burnt.
- For formic acid, a ratio of 1:1 carbon monoxide formed per mole of formic acid was adopted. This is considered a worst case scenario as the number of moles of carbon monoxide produced gradually approaches but never quite reaches 1.

There would also be some extent of incomplete combustion from packaging materials such as cardboard, plastic and wood, which would contribute to smoke generation, however this has been considered much lower compared to that generated by burning flammables.

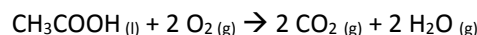
5.9.3 Scenario 8: Ground level concentrations from a fire involving 100 kg of Acetic Acid for a 2 m² pool area

This scenario describes the event that a small fire had occurred involving the combustion of 100 kg of acetic acid for a 2 m² area within the warehouse.



It was calculated that all of the 100 kg of acetic acid would undergo complete combustion in this scenario as there would be enough air within the warehouse to combust 2957 kg of acetic acid completely.

The combustion rate of acetic acid was found to be approximately 0.06 kg/s (TNO Effects) while the rate of combustion products formation was calculated according to the stoichiometric ratio below:



The average molecular weights of acetic acid and carbon dioxide are 60.05 g/mole and 44.01 g/mole respectively. This equates to the release of 36.6 kg of carbon dioxide. TNO effects estimated that the combustion of these products would take 26 minutes to complete. However, a minimum duration of 1 hour is required as the input into AERMOD, therefore an adjusted emission rate of 92.1 g/s of CO₂ was used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

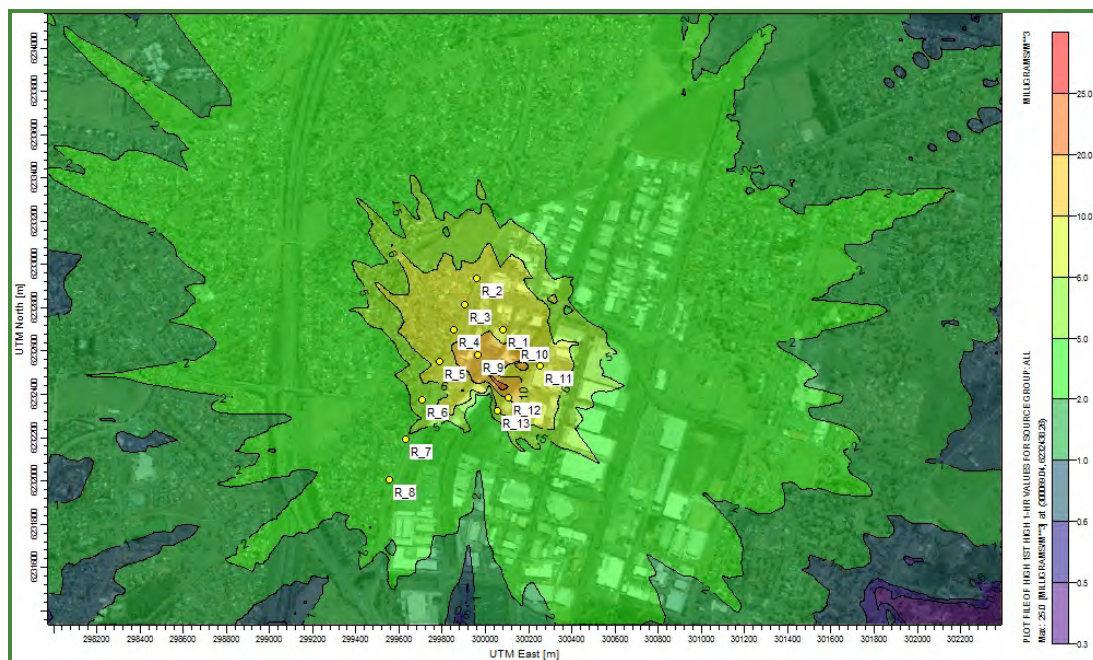
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 1.41 m which is equal to the pool fire diameter;
- Temperature of 117.9°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s

The next step involves estimation of ground level concentration and comparison to the ILDH and ERPG levels to determine potential consequences to the residential areas.

Table 5-17: Scenario 8: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 72,000 mg/m ³ Exceeded?
R1	9	No
R2	8	No
R3	8	No
R4	9	No
R5	8	No
R6	5	No
R7	5	No
R8	3	No
R9	14	No
R10	10	No
R11	8	No
R12	10	No
R13	5	No

Figure 5-13: Scenario 1: Ground Level Concentration of Carbon Dioxide Isopleth



Comment:

The IDLH limit was not exceeded at the identified sensitive receptors for this scenario.

5.9.4 Scenario 9: Ground level concentrations from a fire involving 5000 kg of Acetic acid for a 30 m² pool area

This scenario describes the event that a fire had occurred involving the combustion of 5000 kg of acetic acid for a 30 m² area within the warehouse.

It was calculated that there would only be enough oxygen to fully combust 2957 kg of acetic acid completely. As such incomplete combustion is expected to occur.

The combustion rate of acetic was found to be approximately 0.96 kg/s (TNO Effects). The average molecular weights of acetic acid and carbon monoxide are 60.05 g/mole and 28.01 g/mol respectively. This equates to the release of 1166.1 kg of carbon monoxide. TNO effects estimated that the combustion of these products would take 87 minutes to complete. An emission rate of 224.2 g/s for CO was used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

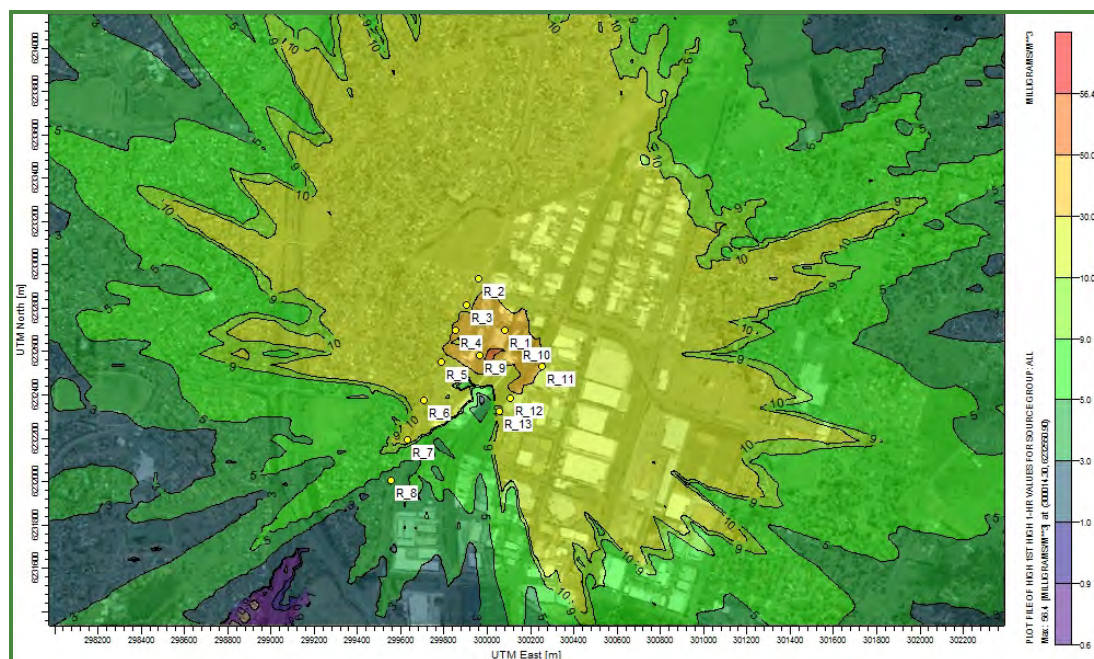
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 5.48 m which is equal to the pool fire diameter;
- Temperature of 117.9°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s

The next step involves estimation of ground level concentration and comparison to the ILDH and ERPG levels to determine potential consequences to the residential areas.

Table 5-18: Scenario 9: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 1,374.7 mg	ERPG – 1 229.1 mg/m ³ exceeded	ERPG-2 401.0 mg/m ³ exceeded	ERPG-3 572.8 mg/m ³ exceeded
R1	36	No	No	No	No
R2	28	No	No	No	No
R3	29	No	No	No	No
R4	31	No	No	No	No
R5	18	No	No	No	No
R6	10	No	No	No	No
R7	11.5	No	No	No	No
R8	4	No	No	No	No
R9	45	No	No	No	No
R10	38.5	No	No	No	No
R11	31	No	No	No	No
R12	18.5	No	No	No	No
R13	13	No	No	No	No

Figure 5-14: Scenario 9: Ground Level Concentration of Carbon Monoxide Isopleth



Comment:

The IDLH limit and ERPG 1-3 limits were not exceeded at the identified sensitive receptors for this scenario.



5.9.5 Scenario 10: Ground level concentration from a fire involving 30,000 kg of Acetic acid for a 30 m² pool area

This scenario describes the event that a small fire had occurred involving the combustion of 30,000 kg of acetic acid for a 30 m² area within the warehouse.

It was calculated that there would only be enough oxygen to fully combust 2957 kg of acetic acid completely. As such incomplete combustion is expected to occur.

The combustion rate of acetic was found to be approximately 0.96 kg/s (TNO Effects). The average molecular weights of acetic acid and carbon monoxide are 60.05 g/mole and 28.01 g/mol respectively. This equates to the release of 6996.7 kg of carbon monoxide. TNO effects estimated that the combustion of these products would take 520 minutes to complete. An emission rate of 224.2 g/s for CO was used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

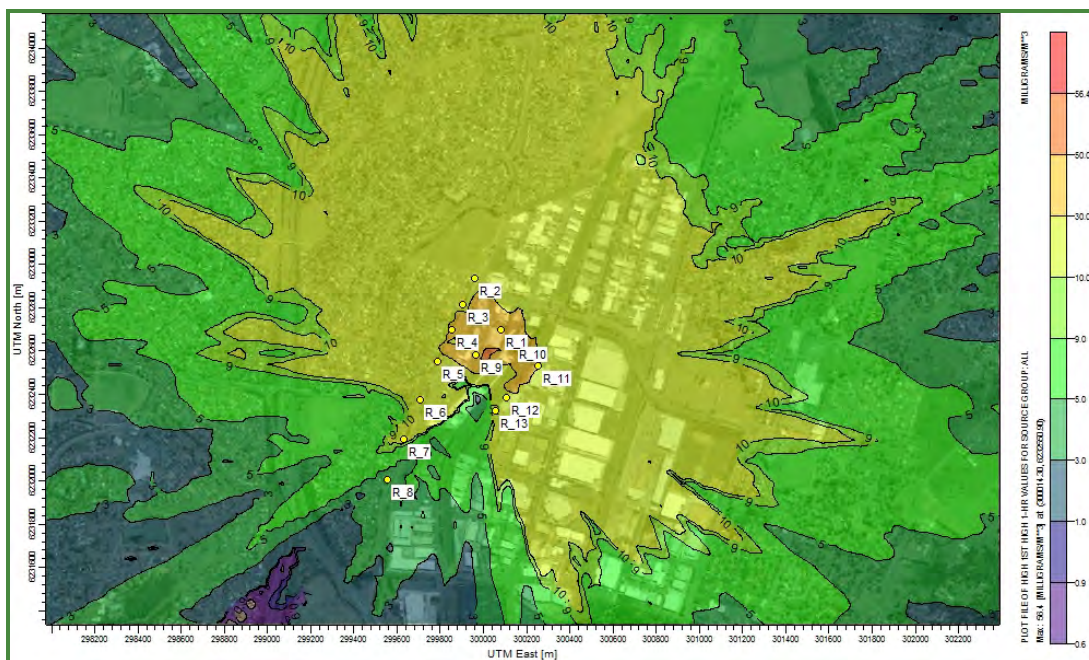
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 5.48 m which is equal to the pool fire diameter;
- Temperature of 117.9°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s

The next step involves estimation of ground level concentration and comparison to the IDLH and ERPG levels to determine potential consequences to the residential areas.

Table 5-19: Scenario 10: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 1,374.7 mg	ERPG – 1 229.1 mg/m ³ exceeded	ERPG-2 401.0 mg/m ³ exceeded	ERPG-3 572.8 mg/m ³ exceeded
R1	36	No	No	No	No
R2	28	No	No	No	No
R3	29	No	No	No	No
R4	31	No	No	No	No
R5	18	No	No	No	No
R6	10	No	No	No	No
R7	11.5	No	No	No	No
R8	4	No	No	No	No
R9	45	No	No	No	No
R10	38.5	No	No	No	No
R11	31	No	No	No	No
R12	18.5	No	No	No	No
R13	13	No	No	No	No

Figure 5-15: Scenario 10: Ground Level Concentration of Carbon Monoxide Isopleth



Comment:

The IDLH limit and ERPG 1-3 limits were not exceeded at the identified sensitive receptors for this scenario.

5.9.6 Scenario 11: Ground level concentrations from a fire involving 5,000 kg of Acetic acid for a 120 m² pool area

This scenario describes the event that a fire had occurred involving the combustion of 5000 kg of acetic acid for a 120 m² area within the warehouse.

It was calculated that there would only be enough oxygen to fully combust 2957 kg of acetic acid completely. As such incomplete combustion is expected to occur.

The combustion rate of acetic acid was found to be approximately 3.84 kg/s (TNO Effects). The average molecular weights of acetic acid and carbon monoxide are 60.05 g/mole and 28.01 g/mol respectively. This equates to the release 1166.1 kg of carbon monoxide. TNO effects estimated that the combustion of these products would take 22 minutes to complete. However, a minimum duration of 1 hour is required as the input into AERMOD, therefore an adjusted emission rate of 1099.24 g/s of CO₂ was used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 10.95 m which is equal to the pool fire diameter;
- Temperature of 117.9°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and

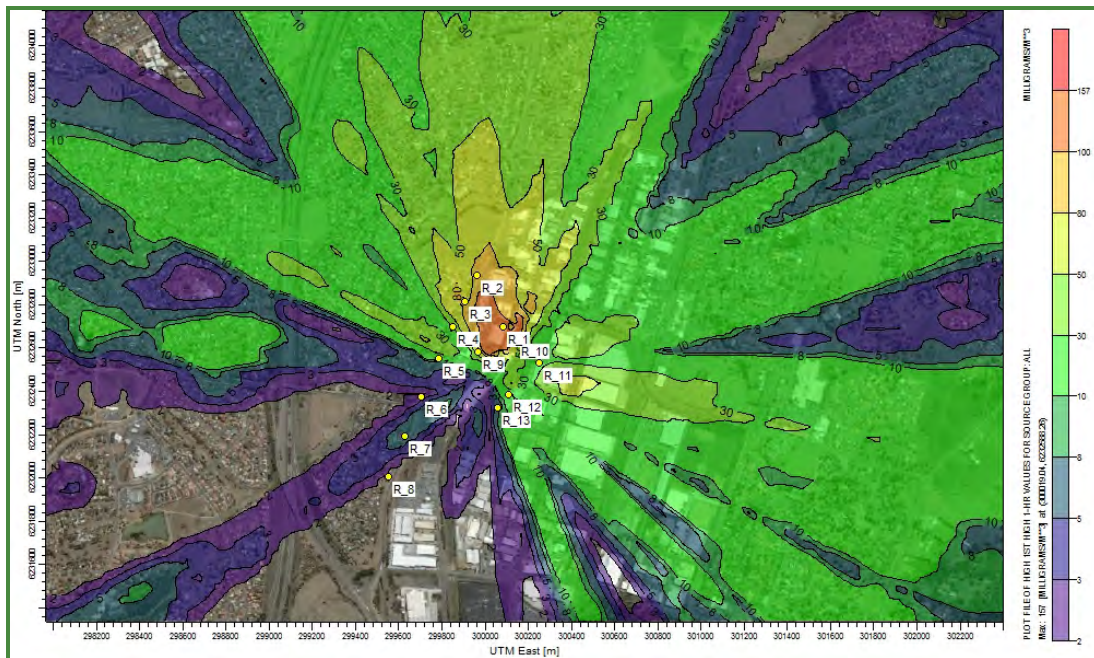
- Exit velocity was assumed to be 4 m/s

The next step involves estimation of ground level concentration and comparison to the ILDH and ERPG levels to determine potential consequences to the residential areas.

Table 5-20: Scenario 11: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 1,374.7 mg	ERPG – 1 229.1 mg/m ³ exceeded	ERPG-2 401.0 mg/m ³ exceeded	ERPG-3 572.8 mg/m ³ exceeded
R1	115	No	No	No	No
R2	90	No	No	No	No
R3	90	No	No	No	No
R4	30	No	No	No	No
R5	11	No	No	No	No
R6	2	No	No	No	No
R7	6.5	No	No	No	No
R8	1	No	No	No	No
R9	54	No	No	No	No
R10	113	No	No	No	No
R11	21	No	No	No	No
R12	13	No	No	No	No
R13	7	No	No	No	No

Figure 5-16: Scenario 11: Ground Level Concentration of Carbon Monoxide Isopleth



Comment:

The IDLH limit and ERPG 1-3 limits were not exceeded at the identified sensitive receptors for this scenario.



5.9.7 Scenario 12: Ground level concentrations from a fire involving 30,000 kg of Acetic acid for a 120 m² pool area

This scenario describes the event that a small fire had occurred involving the combustion of 30,000 kg of acetic acid for a 120 m² area within the warehouse.

It was calculated that there would only be enough oxygen to fully combust 2957 kg of acetic acid completely. As such incomplete combustion is expected to occur.

The combustion rate of acetic acid was found to be approximately 3.84 kg/s (TNO Effects). The average molecular weights of acetic acid and carbon monoxide are 60.05 g/mole and 28.01 g/mol respectively. This equates to the release of 6996.7 kg of carbon monoxide. TNO effects estimated that the combustion of these products would take 130 minutes to complete. An emission rate of 896.7 kg/s and CO was used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

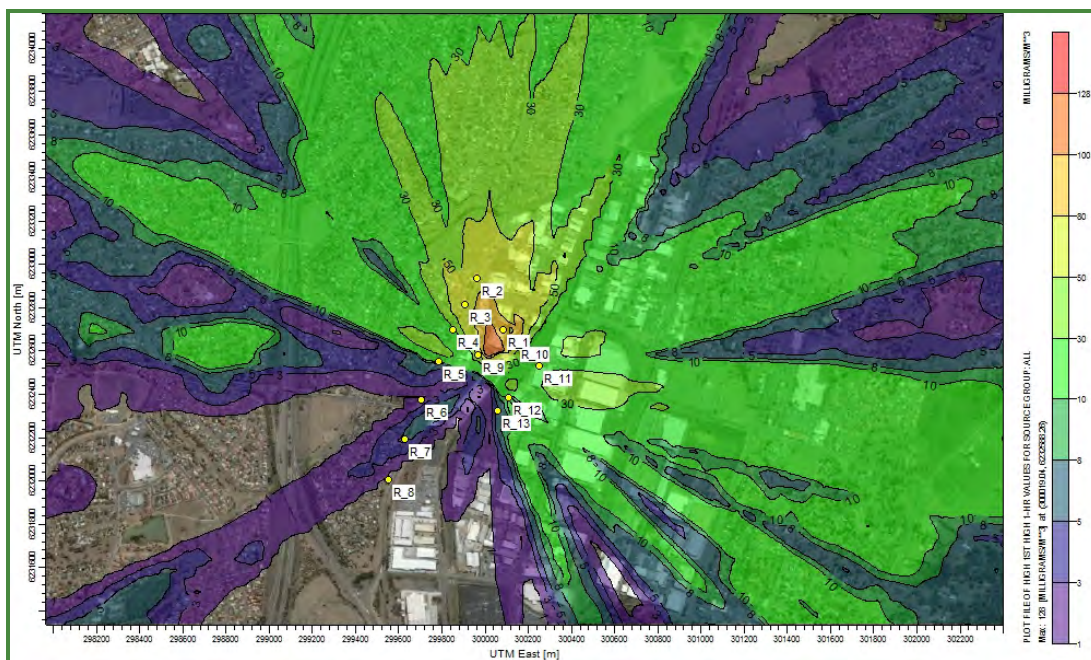
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 10.95 m which is equal to the pool fire diameter;
- Temperature of 117.9°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s

The next step involves estimation of ground level concentration and comparison to the ILDH and ERPG levels to determine potential consequences to the residential areas.

Table 5-21: Scenario 12: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 1,374.7 mg	ERPG – 1 229.1 mg/m ³ exceeded	ERPG-2 401.0 mg/m ³ exceeded	ERPG-3 572.8 mg/m ³ exceeded
R1	94	No	No	No	No
R2	73	No	No	No	No
R3	74	No	No	No	No
R4	25	No	No	No	No
R5	9	No	No	No	No
R6	1.5	No	No	No	No
R7	5.5	No	No	No	No
R8	1	No	No	No	No
R9	44.5	No	No	No	No
R10	91	No	No	No	No
R11	17	No	No	No	No
R12	10.5	No	No	No	No
R13	6	No	No	No	No

Figure 5-17: Scenario 12: Ground Level Concentration of Carbon Monoxide Isopleth



Comment:

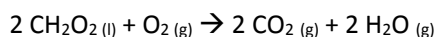
The IDLH limit and ERPG values were not exceeded at the identified sensitive receptors for this scenario.

5.9.8 Scenario 13: Ground level concentrations from a fire involving 100 kg of Formic acid for a 2 m² pool area

This scenario describes the event that a small fire had occurred involving the combustion of 100 kg of formic acid for a 2 m² area within the warehouse.

It was calculated that all of the 100 kg of formic acid would undergo complete combustion in this scenario as there would be enough air within the warehouse to combust 9068 kg of formic acid completely.

The combustion rate of formic acid was found to be approximately 0.02 kg/s (TNO Effects) while the rate of combustion products formation was calculated according to the stoichiometric ratio below:



The average molecular weights of formic acid and carbon dioxide are 46.03 g/mole and 44.01 g/mole respectively. This equates to the release of 47.8 kg of carbon dioxide. TNO effects estimated that the combustion of these products would take 88 minutes to complete. An emission rate of 9.03 g/s of CO₂ was used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:



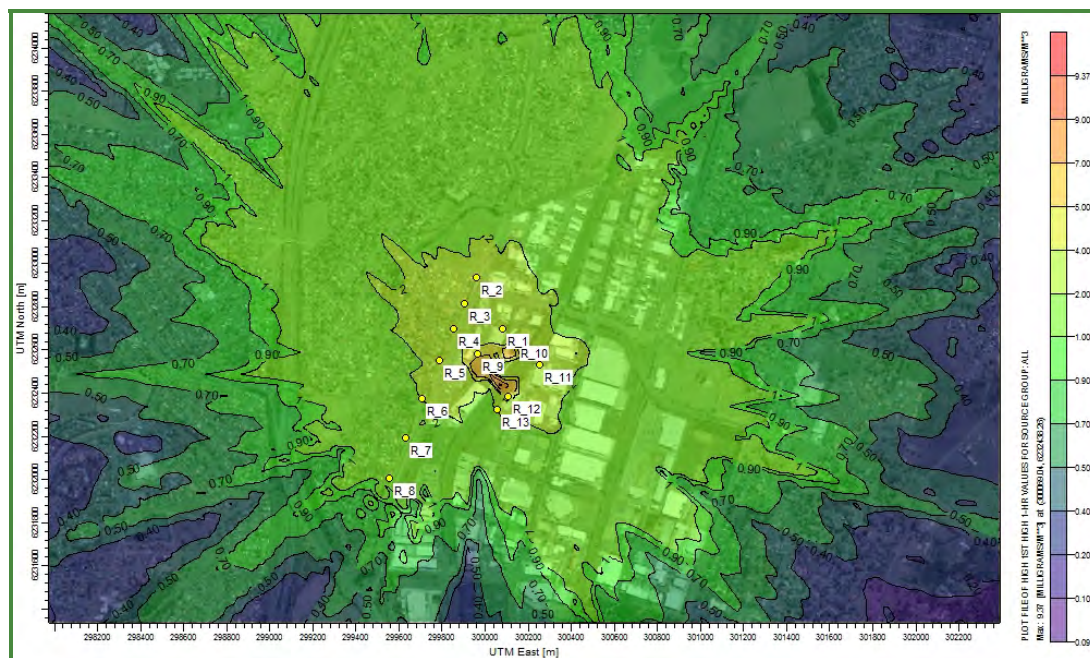
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 1.41 m which is equal to the pool fire diameter;
- Temperature of 101°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s

The next step involves estimation of ground level concentration and comparison to the ILDH and ERPG levels to determine potential consequences to the residential areas.

Table 5-22: Scenario 13: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 72,000 mg/m ³ Exceeded?
R1	3	No
R2	2.5	No
R3	3	No
R4	3	No
R5	3	No
R6	2	No
R7	2	No
R8	1	No
R9	5	No
R10	4	No
R11	3	No
R12	4	No
R13	2	No

Figure 5-18: Scenario 13: Ground Level Concentration of Carbon Dioxide Isopleth



Comment:

The IDLH limit was not exceeded at the identified sensitive receptors for this scenario.

5.9.9 Scenario 14: Ground level concentrations from a fire involving 5000 kg of Formic acid for a 30 m² pool area

This scenario describes the event that a fire had occurred involving the combustion of 5000 kg of formic acid for a 30 m² area within the warehouse.

It was calculated that all of the 5000 kg of formic acid would undergo complete combustion in this scenario as there would be enough air within the warehouse to combust 9068 kg of formic acid completely.

The combustion rate of formic acid was found to be approximately 0.28 kg/s (TNO Effects). The average molecular weights of formic acid and carbon dioxide are 46.03 g/mole and 44.01 g/mole respectively. This equates to the release of 2390.5 kg of carbon dioxide. TNO effects estimated that the combustion of these products would take 294 minutes to complete. An emission rate of 135.4 g/s for CO was used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

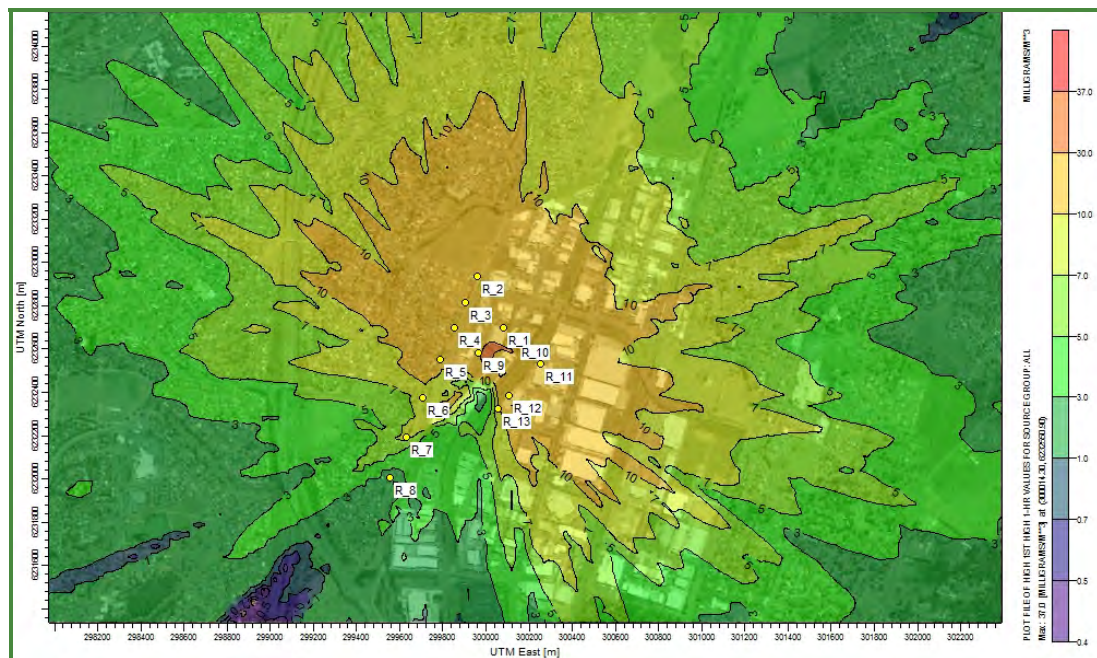
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 5.48 m which is equal to the pool fire diameter;
- Temperature of 101°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s

The next step involves estimation of ground level concentration and comparison to the IDLH and ERPG levels to determine potential consequences to the residential areas.

Table 5-23: Scenario 14: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 72,000 mg/m ³ Exceeded?
R1	23	No
R2	18	No
R3	19	No
R4	22	No
R5	13	No
R6	7	No
R7	8	No
R8	3	No
R9	30	No
R10	24	No
R11	20	No
R12	12.5	No
R13	9	No

Figure 5-19: Scenario 14: Ground Level Concentration of Carbon Dioxide Isoleth



Comment:

The IDLH limit was not exceeded at the identified sensitive receptors for this scenario.

5.9.10 Scenario 15: Ground level concentrations from a fire involving 30,000 kg of Formic acid for a 30 m² pool area

This scenario describes the event that a small fire had occurred involving the combustion of 30,000 kg of formic acid for a 30 m² area within the warehouse.

It was calculated that there would only be enough oxygen to fully combust 9068 kg of formic acid completely. As such incomplete combustion is expected to occur.

The combustion rate of formic acid was found to be approximately 0.28 kg/s (TNO Effects). The average molecular weights of formic acid, carbon dioxide and carbon monoxide are 46.03 g/mole, 44.01 g/mole, and 28.01 g/mol respectively. This equates to the release of 14,343 kg of carbon dioxide and 18,257 kg of carbon monoxide. TNO effects estimated that the combustion of these products would take 1766 minutes to complete. Emission rates of 135.4 and 172.3 g/s for CO₂ and CO respectively were used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

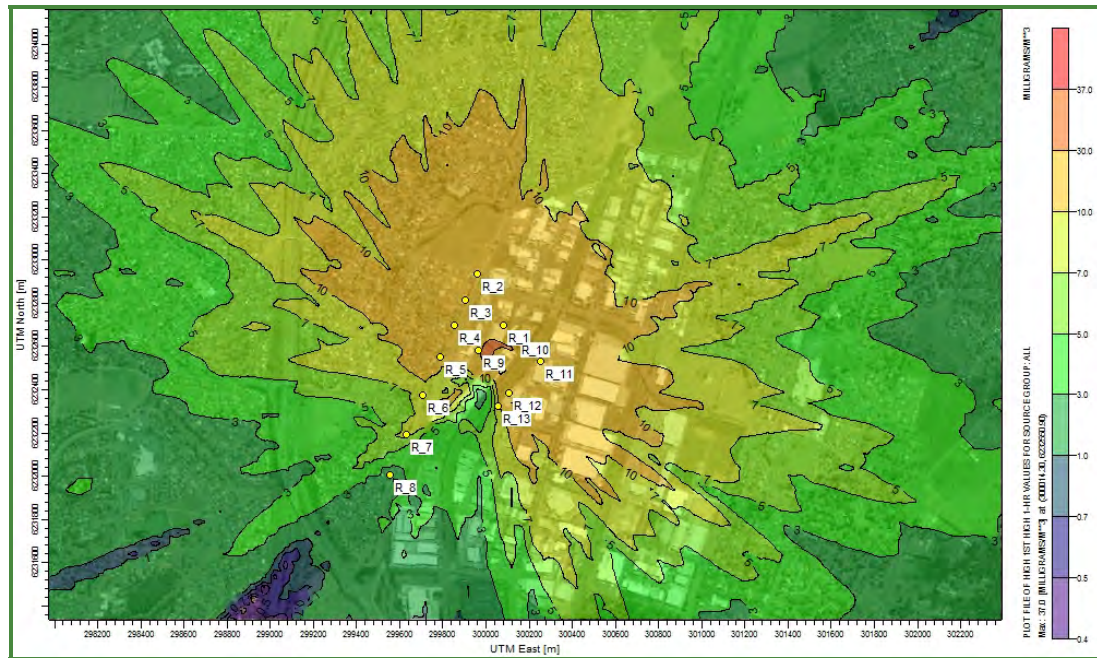
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 5.48 m which is equal to the pool fire diameter;
- Temperature of 101°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s

The next step involves estimation of ground level concentration and comparison to the IDLH and ERPG levels to determine potential consequences to the residential areas.

Table 5-24: Scenario 15: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 72,000 mg/m ³ Exceeded?
R1	23	No
R2	18	No
R3	19	No
R4	22	No
R5	13	No
R6	7	No
R7	8	No
R8	3	No
R9	29	No
R10	24	No
R11	20	No
R12	13	No
R13	9	No

Figure 5-20: Scenario 15: Ground Level Concentration of Carbon Dioxide Isopleth



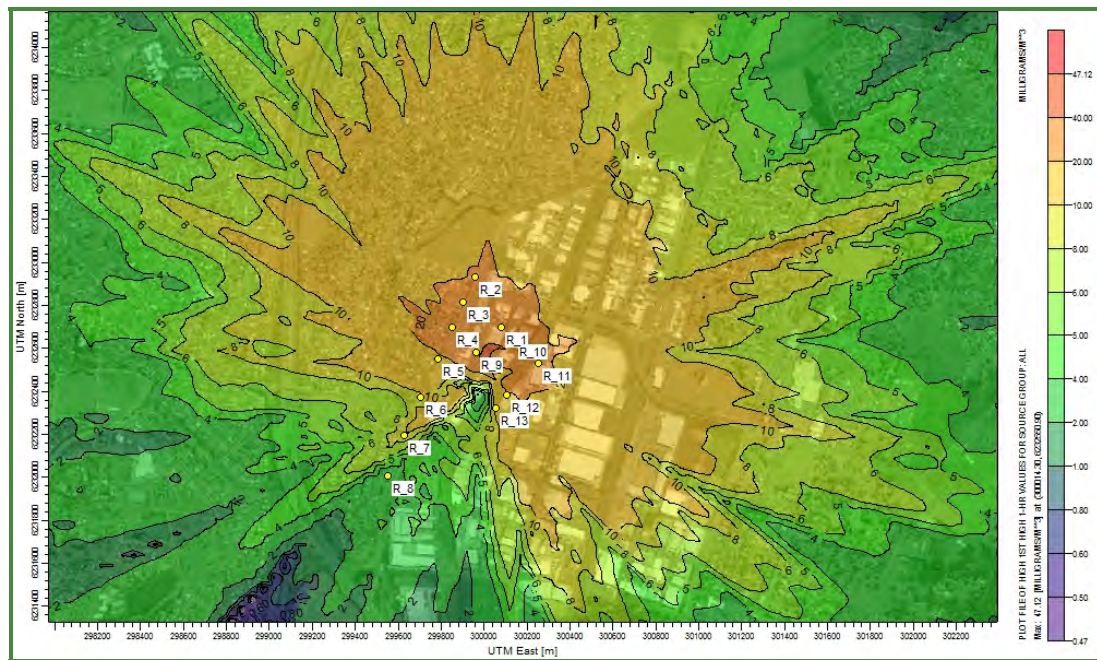
Comment:

The IDLH limit was not exceeded at the identified sensitive receptors for this scenario.

Table 5-25: Scenario 15: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 1,374.7 mg	ERPG – 1 229.1 mg/m ³ exceeded	ERPG-2 401.0 mg/m ³ exceeded	ERPG-3 572.8 mg/m ³ exceeded
R1	30	No	No	No	No
R2	22	No	No	No	No
R3	24	No	No	No	No
R4	28	No	No	No	No
R5	16	No	No	No	No
R6	9	No	No	No	No
R7	10	No	No	No	No
R8	3.5	No	No	No	No
R9	37.4	No	No	No	No
R10	31	No	No	No	No
R11	25.5	No	No	No	No
R12	16	No	No	No	No
R13	11	No	No	No	No

Figure 5-21: Scenario 15: Ground Level Concentration of Carbon Monoxide Isopleth



Comment:

The IDLH limit was not exceeded at the identified sensitive receptors for this scenario.

5.9.11 Scenario 16: Ground level concentrations from a fire involving 5,000 kg of Formic acid for a 120 m² pool area

This scenario describes the event that a small fire had occurred involving the combustion of 5,000 kg of formic acid for a 120 m² area within the warehouse.

It was calculated that all of the 5000 kg of formic acid would undergo complete combustion in this scenario as there would be enough air within the warehouse to combust 9068 kg of formic acid completely.

The combustion rate of formic acid was found to be approximately 1.13 kg/s (TNO Effects). The average molecular weights of formic acid and carbon dioxide are 46.03 g/mole and 44.01 g/mole respectively. This equates to the release of 2390.5 kg of carbon dioxide. TNO effects estimated that the combustion of these products would take 74 minutes to complete. An emission rate of 541.6 g/s for CO₂ was used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

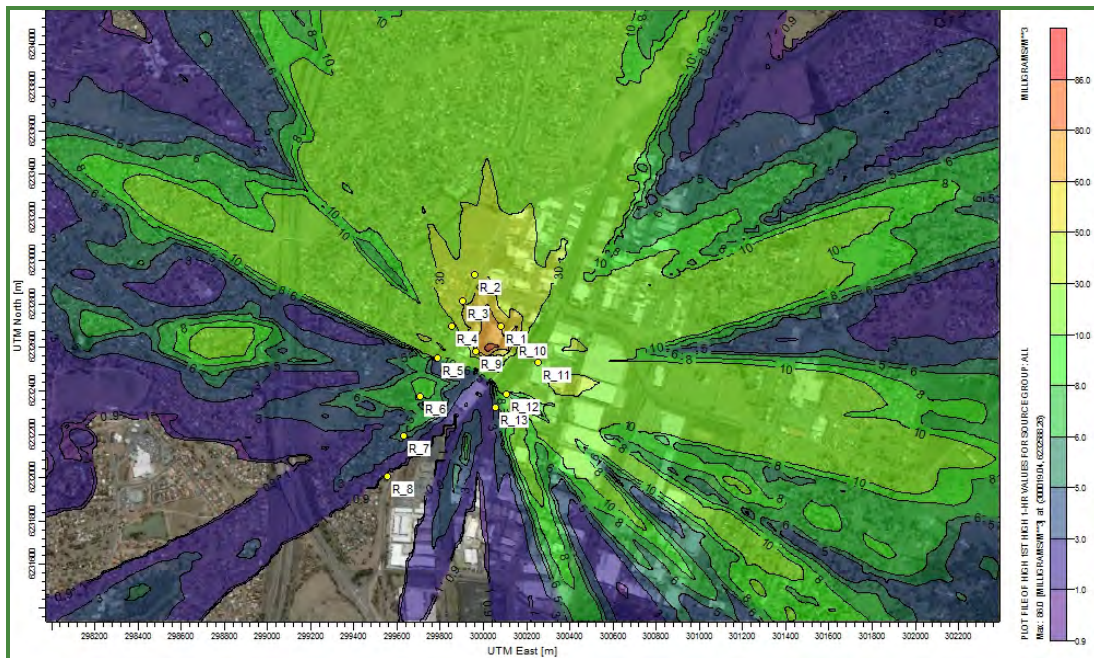
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 10.95 m which is equal to the pool fire diameter;
- Temperature of 101°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s

The next step involves estimation of ground level concentration and comparison to the IDLH and ERPG levels to determine potential consequences to the residential areas.

Table 5-26: Scenario 16: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 72,000 mg/m ³ Exceeded?
R1	61	No
R2	46	No
R3	51.5	No
R4	20	No
R5	7	No
R6	9	No
R7	5.5	No
R8	1	No
R9	51	No
R10	62	No
R11	23	No
R12	10	No
R13	3.5	No

Figure 5-22: Scenario 16: Ground Level Concentration of Carbon Dioxide Isoleth



Comment:

The IDLH limit was not exceeded at the identified sensitive receptors for this scenario.

5.9.12 Scenario 17: Ground level concentrations from a fire involving 30,000 kg of Formic acid for a 120 m² pool area

This scenario describes the event that a small fire had occurred involving the combustion of 30,000 kg of formic acid for a 120 m² area within the warehouse.

It was calculated that there would only be enough oxygen to fully combust 9068 kg of formic acid completely. As such incomplete combustion is expected to occur.

The combustion rate of formic acid was found to be approximately 1.13 kg/s (TNO Effects). The average molecular weights of formic acid, carbon dioxide and carbon monoxide are 46.03 g/mole, 44.01 g/mole, and 28.01 g/mol respectively. This equates to the release of 14,343 kg of carbon dioxide and 18,257 kg of carbon monoxide. TNO effects estimated that the combustion of these products would take 441 minutes to complete. Emission rates of 541.6 and 689.4 g/s for CO₂ and CO respectively were used. The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data.

A list of additional modelling assumptions used in AERMOD is provided below:

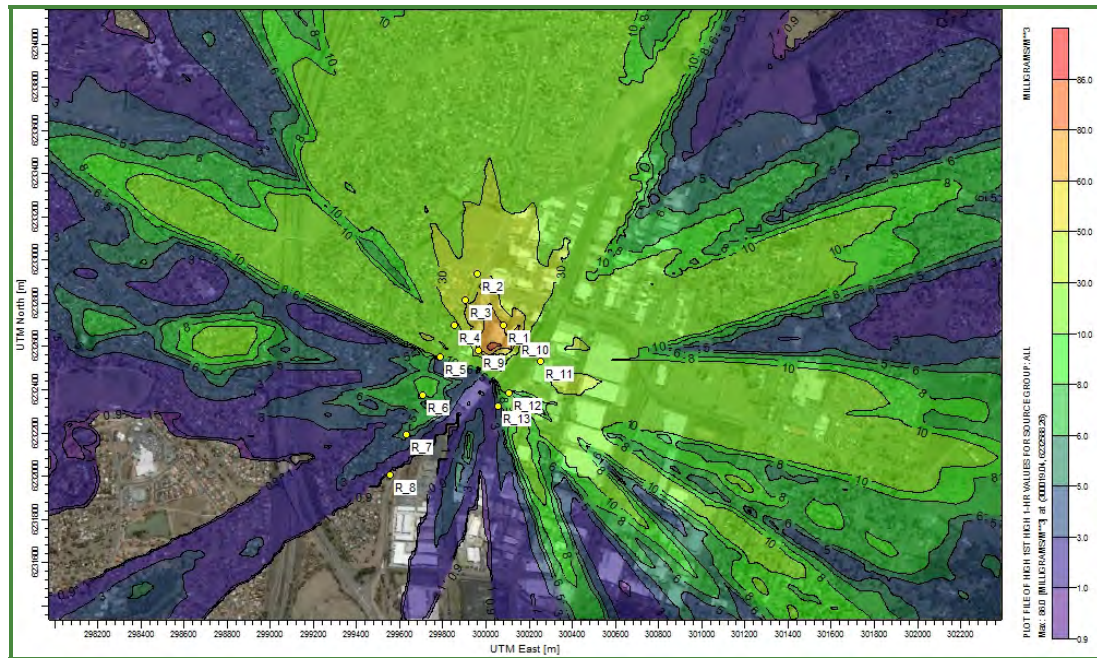
- Toxic emissions were modelled as a point flare source with a stack height of 4.25 m which is equal to half the height of the inside of the building (calculated from TNO Effects) and a stack diameter of 10.95 m which is equal to the pool fire diameter;
- Temperature of 101°C which is equal to the minimum temperature for the liquid to undergo combustion predicted by TNO Effects; and
- Exit velocity was assumed to be 4 m/s.

The next step involves estimation of ground level concentration and comparison to the IDLH and ERPG levels to determine potential consequences to the residential areas.

Table 5-27: Scenario 17: Ground Level Concentration of Carbon Dioxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m ³) 1 hour averaging period	IDLH 72,000 mg/m ³ Exceeded?
R1	61	No
R2	46	No
R3	51.5	No
R4	20	No
R5	7	No
R6	9	No
R7	6	No
R8	1	No
R9	51	No
R10	62	No
R11	23	No
R12	10	No
R13	4	No

Figure 5-23: Scenario 17: Ground Level Concentration of Carbon Dioxide Isopleth



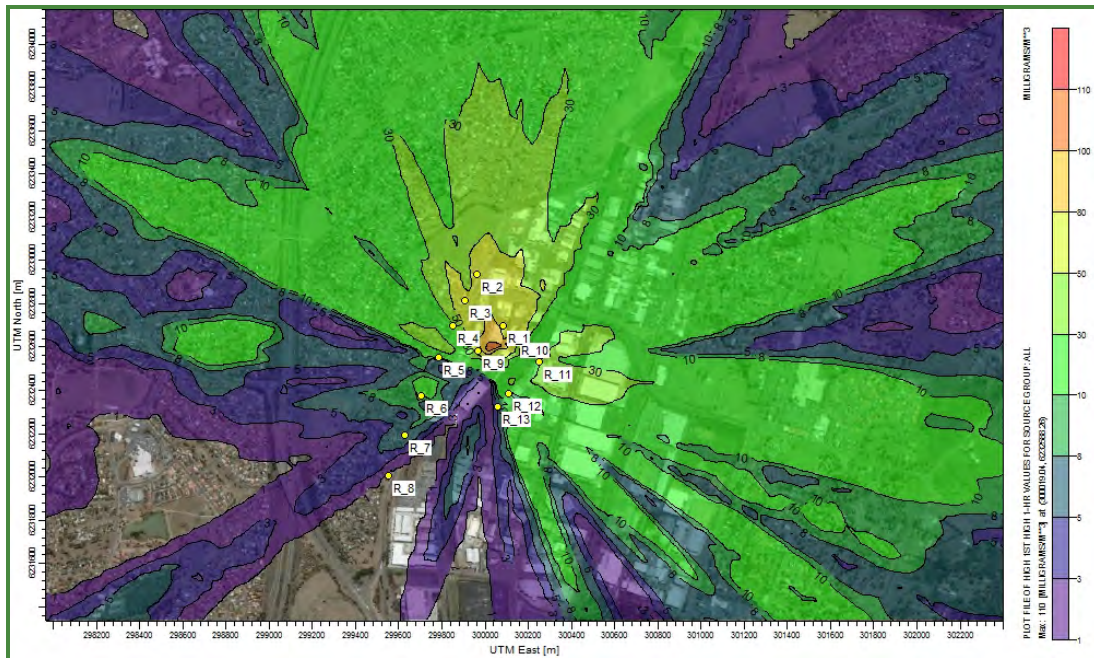
Comment:

The IDLH limit was not exceeded at the identified sensitive receptors for this scenario.

Table 5-28: Scenario 17: Ground Level Concentration of Carbon Monoxide at Sensitive Receptors

Receptors	Ground Level Concentration (mg/m³) 1 hour averaging period	IDLH 1,374.7 mg	ERPG – 1 229.1 mg/m³ exceeded	ERPG-2 401.0 mg/m³ exceeded	ERPG-3 572.8 mg/m³ exceeded
R1	78	No	No	No	No
R2	59	No	No	No	No
R3	66	No	No	No	No
R4	25	No	No	No	No
R5	9	No	No	No	No
R6	12	No	No	No	No
R7	7	No	No	No	No
R8	1	No	No	No	No
R9	65	No	No	No	No
R10	79	No	No	No	No
R11	30	No	No	No	No
R12	13	No	No	No	No
R13	5	No	No	No	No

Figure 5-24: Scenario 17: Ground Level Concentration of Carbon Monoxide Isopleth



Comment:

The IDLH limit was not exceeded at the identified sensitive receptors for this scenario.

5.10 CONSEQUENCE ANALYSIS – TOXIC EMISSIONS FROM SPILLS

The dispersion calculations are based on determining the worst case ground level concentrations.

The modelling assumes there are no controls in place. A reduction factor of 0.1 was used to adjust the results to account for the building that encloses the facility (90% efficiency).

The analyses of scenarios where large volume spillages are modelled without controls in place or without reactive responses being implemented are hardly credible on this site.

Therefore results presented have been adjusted to account for the building that encloses the facility.

5.10.1 Scenario 18: Spill involving 100 kg of Acetic Acid

This section examines the scenario involving a spill of 100 kg of acetic acid within the warehouse. The toxic vapours evaporated from the spill would most likely be released to the atmosphere from the roller shutter doors. These emissions have been modelled using AERMOD where volume sources have been used to represent each source.

The following calculations and assumptions were considered in the modelling of effects using AERMOD:

- 100 kg of acetic acid will be involved in the spill;
- A maximum pool surface area of 2 m² was used;

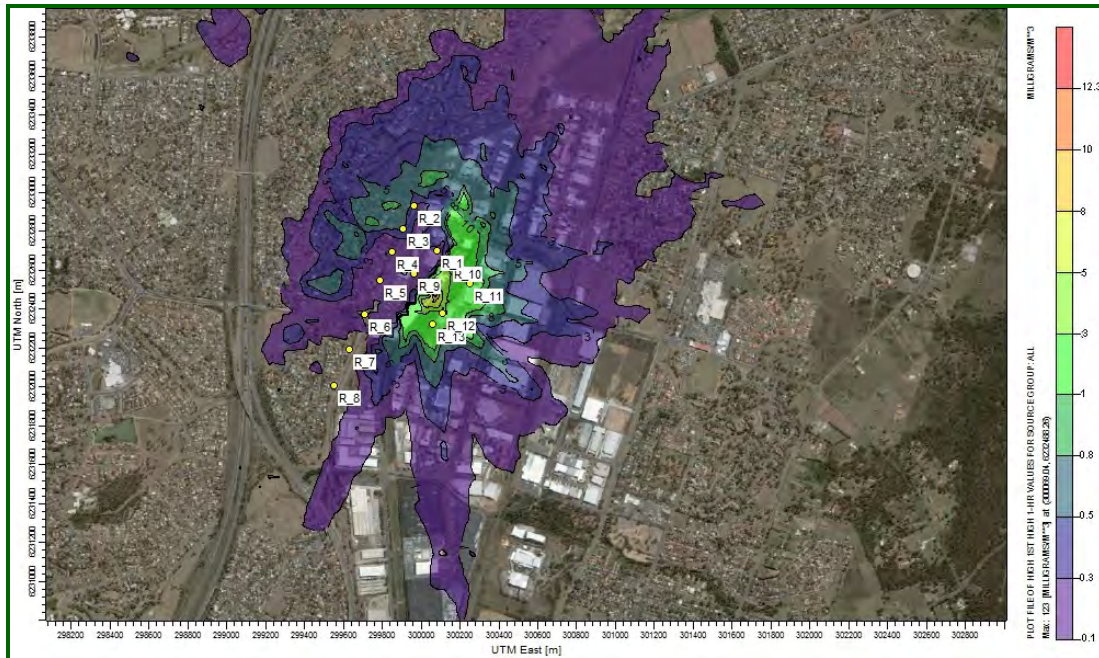


- Meteorological data file of the nearest weather monitoring station at Campbelltown for the year 2015 was used;
- The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data;
- A total evaporation rate of 1.5 g/s was generated from the Pool Evaporation model in TNO Effects;
- No control measures were assumed in the modelling. A reduction factor of 0.1 has been applied to the results to account for the building that encloses the facility. No other control measures are assumed to be in place.

Table 5-29: Scenario 18: Ground Level Concentration of Acetic Acid at Sensitive Receptors for spill of 100 kg over 2 m².

Receptor	Ground Level Concentration (mg/m ³)	IDLH Exceeded?	ERPG-1		ERPG-2 87.5 mg/m ³	ERPG-3 625 mg/m ³
			125 mg/m ³	12.5 mg/m ³		
R1	0.2	No	No	No	No	No
R2	0.3	No	No	No	No	No
R3	0.4	No	No	No	No	No
R4	0.6	No	No	No	No	No
R5	0.2	No	No	No	No	No
R6	0.2	No	No	No	No	No
R7	0.1	No	No	No	No	No
R8	0.1	No	No	No	No	No
R9	0.1	No	No	No	No	No
R10	0.2	No	No	No	No	No
R11	0.6	No	No	No	No	No
R12	1.7	No	No	No	No	No
R13	2.5	No	No	No	No	No

Figure 5-25: Scenario 18: Adjusted Ground Level Concentration of Acetic Acid Isopleth for spill of 100 kg over 2 m².



Comment:

There are no exceedances of health risk levels at the childcare centre, residences or nearby industrial premises.

5.10.2 Scenario 19: Spill involving 5,000 kg of Acetic Acid

This section examines the scenario involving a spill of 5,000 kg of acetic acid within the warehouse. The toxic vapours evaporated from the spill would most likely be released to the atmosphere from the roller shutter doors. These emissions have been modelled using AERMOD where volume sources have been used to represent each source.

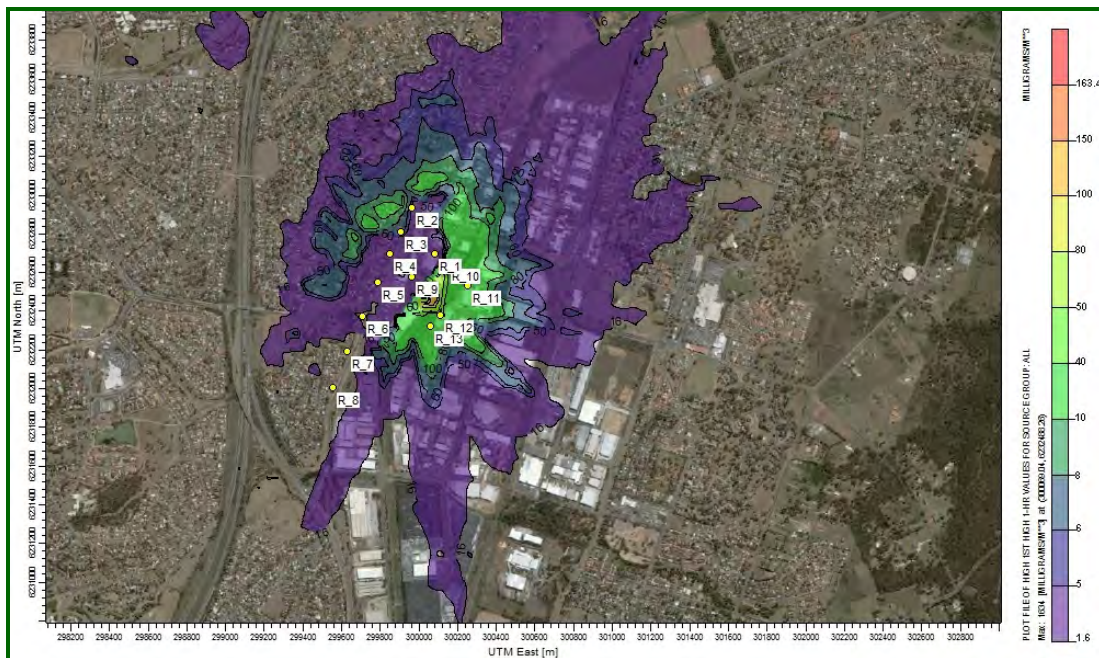
The following calculations and assumptions were considered in the modelling of effects using AERMOD:

- 5,000 kg of acetic acid will be involved in the spill;
- A maximum pool surface area of 30 m² was used;
- Meteorological data file of the nearest weather monitoring station at Campbelltown for the year 2015 was used;
- The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data;
- A total evaporation rate of 20 g/s was generated from the Pool Evaporation model in TNO Effects;
- No control measures were assumed in the modelling. A reduction factor of 0.1 has been applied to the results to account for the building that encloses the facility. No other control measures are assumed to be in place.

Table 5-30: Scenario 19: Adjusted Ground Level Concentration of Acetic Acid at Sensitive Receptors for spill of 5,000 kg over 30 m².

Receptor	Ground Level Concentration (mg/m ³)	IDLH Exceeded?	ERPG-1		ERPG-2 87.5 mg/m ³	ERPG-3 625 mg/m ³
			125 mg/m ³	12.5 mg/m ³		
R1	3.3	No	No	No	No	No
R2	4.8	No	No	No	No	No
R3	7.5	No	No	No	No	No
R4	2.4	No	No	No	No	No
R5	2.3	No	No	No	No	No
R6	1.3	No	No	No	No	No
R7	1.1	No	No	No	No	No
R8	0.8	No	No	No	No	No
R9	2.4	No	No	No	No	No
R10	7.9	No	No	No	No	No
R11	22.4	No	No	Yes	No	No
R12	33.1	No	No	Yes	No	No
R13	28.0	No	No	Yes	No	No

Figure 5-26: Scenario 19: Adjusted Ground Level Concentration of Acetic Acid Isopleth for spill of 5,000 kg over 30 m².



Comment:

There are no exceedances of health risk levels at the childcare centre and residences. R11–R13 are industrial sites. Exceedances of ERPG-1 values may occur under worst-case wind conditions towards these industrial receptors. ERPG-1 values relate to the potential for irritation to a person standing in the open. This exceedance demonstrates that the emergency plan would need to address the use of fogging nozzles available at hose reels so that the spill could be diluted and any



release of acetic acid absorbed by fine droplets of water. Potential presence of irritant fumes would require these sites to be advised if there were such a pollution incident. No life threatening concentrations would be expected.

5.10.3 Scenario 20: Spill involving 100 kg of Formic Acid

This section examines the scenario involving a spill of 100 kg of formic acid within the warehouse. The toxic vapours evaporated from the spill would most likely be released to the atmosphere from the roller shutter doors. These emissions have been modelled using AERMOD where volume sources have been used to represent each source.

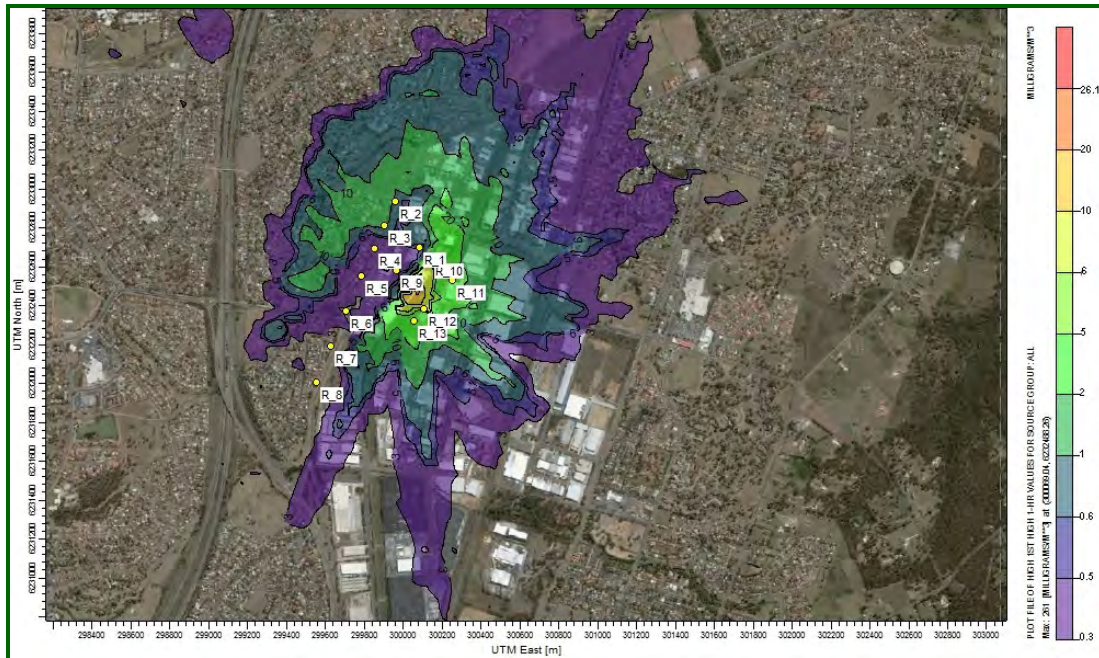
The following calculations and assumptions were considered in the modelling of effects using AERMOD:

- 100 kg of formic acid will be involved in the spill;
- A maximum pool surface area of 2 m² was used;
- Meteorological data file of the nearest weather monitoring station at Campbelltown for the year 2015 was used;
- The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data;
- A total evaporation rate of 3.2 g/s was generated from the Pool Evaporation model in TNO Effects;
- No control measures were assumed in the modelling. A reduction factor of 0.1 has been applied to the results to account for the building that encloses the facility. No other control measures are assumed to be in place.

Table 5-31: Scenario 20: Adjusted Ground Level Concentrations of Formic Acid at Sensitive Receptors for spill of 100 kg over 2 m².

ERPG-2	Ground Level Concentration (mg/m ³)	IDLH Exceeded?	ERPG-1		ERPG-2 47.5 mg/m ³	ERPG-3 475 mg/m ³
			57 mg/mg ³	5.7 mg/mg ³		
R1	0.5	No	No	No	No	No
R2	0.8	No	No	No	No	No
R3	1.2	No	No	No	No	No
R4	0.4	No	No	No	No	No
R5	0.4	No	No	No	No	No
R6	0.2	No	No	No	No	No
R7	0.2	No	No	No	No	No
R8	0.1	No	No	No	No	No
R9	0.4	No	No	No	No	No
R10	1.3	No	No	No	No	No
R11	3.6	No	No	No	No	No
R12	5.3	No	No	No	No	No
R13	4.5	No	No	No	No	No

Figure 5-27: Scenario 20: Adjusted Ground Level Concentrations of Formic Acid Isopleth for spill of 100 kg over 2 m².



Comment:

There are no exceedances of health risk levels at the childcare centre, residences or nearby industrial premises.

5.10.4 Scenario 21: Spill involving 5,000 kg of Formic Acid

This section examines the scenario involving a spill of 5,000 kg of formic acid within the warehouse. The toxic vapours evaporated from the spill would most likely be released to the atmosphere from the roller shutter doors. These emissions have been modelled using AERMOD where volume sources have been used to represent each source.

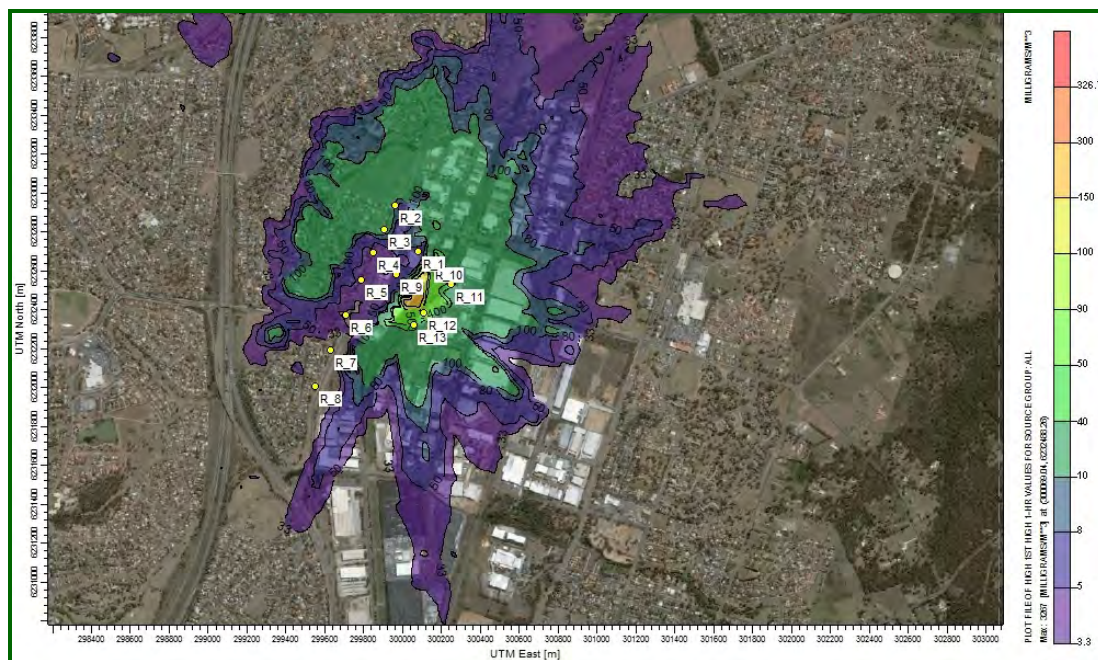
The following calculations and assumptions were considered in the modelling of effects using AERMOD:

- 5,000 kg of formic acid will be involved in the spill;
- A maximum pool surface area of 30 m² was used;
- Meteorological data file of the nearest weather monitoring station at Campbelltown for the year 2015 was used;
- The event was modelled to occur continuously in order to assess peak 1 hour impacts over the entire year range of meteorological data;
- A total evaporation rate of 40 g/s was generated from the Pool Evaporation model in TNO Effects;
- No control measures were assumed in the modelling. A reduction factor of 0.1 has been applied to the results to account for the building that encloses the facility. No other control measures are assumed to be in place.

Table 5-32: Scenario 21: Adjusted Ground Level Concentrations of Formic Acid at Sensitive Receptors for spill of 5,000 kg over 30 m².

Receptor	Ground Level Concentration (mg/m ³)	IDLH Exceeded?	ERPG-1		ERPG-2 47.5 mg/m ³	ERPG-3 475 mg/m ³
			57 mg/mg ³	5.7 mg/mg ³		
R1	6.53	No	No	Yes	No	No
R2	9.7	No	No	Yes	No	No
R3	15.02	No	No	Yes	No	No
R4	4.84	No	No	No	No	No
R5	4.56	No	No	No	No	No
R6	2.75	No	No	No	No	No
R7	2.01	No	No	No	No	No
R8	1.58	No	No	No	No	No
R9	4.9	No	No	No	No	No
R10	15.69	No	No	Yes	No	No
R11	44.9	No	No	Yes	No	No
R12	66.12	Yes	Yes	Yes	Yes	No
R13	56.13	No	No	Yes	Yes	No

Figure 5-28: Scenario 21: Adjusted Ground Level Concentration of Formic Acid Isopleth for spill of 5,000 kg over 30 m².



Comment:

There are minor exceedances of health risk levels at the childcare centre and residences R2 and R3. R10–R13 are industrial sites. Potential presence of irritant fumes would require these sites to be advised if there were such a pollution incident. R1, R2 and R3 would also be included in any warning. The potential for life threatening levels exist and although a spillage of this size is not credible with the safeguards in place, the analysis supports the need for these safeguards and detailed consideration of the spill control actions in the Emergency Plan and the PIRMP. The main



control available is closing doors of the building, hence preventing fumes from being able to be dispersed.

The tanks would each have a number of safeguards and backup safeguards.

These are:

- Level indicators near the filling points.
- Level indicators within the PLDC system graphic displays in the control room.
- Level alarms at the desired levels of liquid in the tank.
High level alarm if this level is exceeded. Alarms are a flashing light and alarm audible within the Stage IV facility.
- The filling line for the acetic and formic acid tanks would both have a shut off valve on the filling line if the high level alarm is activated.
- The overflow pipe on these tanks would be piped into a 100 L pit that is able to be filled with water and used to dilute the spilt liquid.
- The bunded area is able to be fogged using hose reels and as well the tank cooling water is able to be used to provide a large volume of water to cover the spill.

5.11 DISCUSSION OF THE FINDINGS

The heat of radiation calculations show that a fire involving 3,000 kg could expose the alkali storage tanks to sufficient heat to lead to tank failure. This could then cause the alkali to be decomposed and release toxic gases.

To prevent this from being a credible event the following safeguards were included in the design of the Stage IV facility:

- 240/240/240 fire rated walls between the three sets of bulk storage tanks i.e. the acids-alkali have a 240/240/240 fire rated wall and similarly the alkali-food grades.

This design also provides effective separation distances.

- Within the acids tank farm the following would be provided:
 - ▶ The acetic and formic acids would be stored at either end of the tank farm to maximise separation whenever it is practical to do so.
 - ▶ The acid tanks would each have intervening bund walls of a height less than the perimeter bund wall of the acid tank farm.

This would contain a spill and a pool fire during its initial ignition.

- ▶ The tanker loading/unloading areas for acids have been separated from this similar area for the alkali and food grade chemicals.

This confines a pool fire so that it is less able to envelop the alkali and food grade chemicals.

The two separated tanker loading/unloading areas would also be graded in opposite directions. A sump would be provided at the far ends of these two areas.



This practice would also aid the fire fighting of a pool fire during the initial stage of fire development.

- ▶ Each of the storage tanks would be provided with cooling water based on the design requirements from AS 1940 such that ~28 litres/second is required per tank.

This water supply capacity is in addition to the water supply required for hose reels and hydrants.

These safeguards are basic measures that are needed and reduce the risk of a fire event to a minimal level.

The release of toxic fume from a large spill involving either acetic or formic acid could, under unfavourable wind conditions, expose receivers to irritating levels of these chemicals. Although a large spill within the Stage IV facility is extremely unlikely and has not occurred at the Deltrex Girraween site, a number of safeguards have been designed into the facility.

In summary these are:

- Level indicators near the filling points.
- Level indicators within the PLDC system graphic displays in the control room.
- Level alarms at the desired levels of liquid in the tank.
- High level alarm if this level is exceeded. Alarms are a flashing light and alarm audible within the Stage IV facility.
- The filling line for the acetic and formic acid tanks would both have a shut off valve on the filling line if the high level alarm is activated.
- The overflow pipe on these tanks would be piped into a 100 L pit that is able to be filled with water and used to dilute the spilt liquid.
- The bunded area is able to be fogged using hose reels and as well the tank cooling water is able to be used to provide a large volume of water to cover the spill.

The proposed modifications would not cause a cumulative hazard to occur as, in the existing warehouses being used for basic logistics operations with no decanting or processing, the level of risk is very low.



6. CONTAINMENT OF CONTAMINATED FIREFIGHTING WATER

The methodology for calculating the amount of contaminated firefighting water to be contained and the methodology of containment follow the recommendations in the document *HIPAP No. 2 - Fire Safety Study Guidelines* (DoP 2011) and the *Best Practice Guidelines for Contaminated Water Retention and Treatment Systems* (HMPCC 1994).

6.1 IDENTIFICATION OF MATERIALS AND HAZARDS

A potential hazard that could occur on the site that would produce contaminated water would be a fire. It is expected that the firewater used to fight or contain a fire would become contaminated due to liquid being released in the event of tank/hose/fitting failure.

During a fire event it is expected that depending on the location and extent of the fire some of the liquid would be combusted. The liquid and the products of burning liquid would therefore contaminate the spent firewater.

6.2 CONSEQUENCES OF CONTAMINATED FIRE WATER

If no system were in place to contain used firewater then it would enter the site stormwater system, and would flow off site, into local waterways (Maxwells Creek) or directly enter Maxwells Creek. If the water was contaminated with significant levels of hazardous materials, there is the potential for an impact on the waterways. In recognition of this a containment system has been devised and has been put into place.

6.3 ESTIMATION OF POTENTIAL CONTAMINATED FIREWATER VOLUMES

The primary method to capture the contaminated firewater is the implementation of bunding for the entire site. The height of the bund would need to be 160 mm along the perimeter of the sites hardstand surface.

A worst-case fire scenario at the site has been used to calculate the maximum amount of contaminated firewater that would be generated in such an event. This would involve a fire consuming a large proportion of the Site and the Fire Brigade using a large number of services available, which include the following:

- 3 Fire Hydrants.

Thus the discharges of these for 90 minutes will be equal to:



Table 6-1: Required Containment of Contaminated Firewater

Total Containment Required	
<u>Fire Hydrants</u>	
Operational Discharge of 20 L/s	432,000 L
20 L/s x 60 s/min x 90 min = 108,000 L	
4 x 108,000 L = 432,000 L	
Total Requirement of Firewater Containment	432,000 L
Containment already exists – exceeds 432,000L	

6.4 ANALYSIS OF CONTAMINATED FIRE FIGHTING WATER, TREATMENT AND DISPOSAL

Fire fighting water would require analysis prior to being removed from the site. Pending the results, the water would be either disposed off-site by a licensed liquid disposal contractor or discharged to stormwater.

Analysis would involve sampling the firewater with the subsequent analysis conducted by a NATA accredited laboratory. The water would be analysed for specific analytes based on the location of fire and the types of contaminants that may have potentially contaminated the firewater. The results of the analysis would be compared against the current Australian water quality benchmarks. If the criteria are satisfied, the water would be discharged to stormwater. Otherwise the water would have to be pumped into a series of road tankers and disposed by a licensed liquid disposal contractor.

The firewater would be held on site for the time taken for analysis to be completed. The maximum time expected would be 24 hours. If at any stage rain threatened the contaminated firewater storage to overflow then the contained waters would be immediately assumed to be contaminated and a licensed contractor commissioned to pump the contaminated water and remove from site.

6.5 ANALYSIS OF CONTAMINATED FIRE FIGHTING WATER, TREATMENT AND DISPOSAL

Fire fighting water would require analysis prior to being removed from the site. Pending the results, the water would be either disposed off-site by a licensed liquid disposal contractor or discharged to stormwater.

Analysis would involve sampling the firewater with the subsequent analysis conducted by a NATA accredited laboratory. The water would be analysed for specific analytes based on the location of fire and the types of contaminants that may have potentially contaminated the firewater. The results of the analysis would be compared against the current Australian water quality benchmarks. If the criteria are satisfied, the water would be discharged to stormwater. Otherwise the water would have to be pumped into a series of road tankers and disposed by a licensed liquid disposal contractor.



The firewater would be held on site for the time taken for analysis to be completed. The maximum time expected would be 24 hours. If at any stage rain threatened the contaminated firewater storage to overflow then the contained waters would be immediately assumed to be contaminated and a licensed contractor commissioned to pump the contaminated water and remove from site.



7. HAZARD AND RISK ANALYSIS

Table 7-1: Hazard and Risk Register

Event Number	Hazard Identification Guide Word	Hazardous Event	Causes	Prevention Safeguards	Consequences	Mitigation Safeguards	Consequences	Likelihood	Existing Risk Rating	Is the risk ALARP?	Additional Safeguards	Consequence	Likelihood	Residual Risk Rating
1. General Site Risks														
1	External Fire / Explosion	Vehicle fire	Brake fire. Tyre fire. Fuel leak (e.g. fork lift trucks (FLT) use LPG) and fire. Batteries short-circuiting. Packaging fires	Vehicle design and maintenance, vehicles registered, DG licensed drivers, inspected vehicles, no smoking on site (except in the designated area), hot work permit	Damage to the vehicle, propagation to package goods storage and property damage	Operator response to oil leaks, fire extinguishers, fire water available from hydrants and hand-held hoses, emergency response plan includes actions to take if a fire occurs	Significant	Unlikely	III	Yes		Significant	Unlikely	III
2	Activity Hazards	Injury to the heavy vehicle driver	Lifting the side gates into place on a heavy vehicle	Cage designed to be of minimum weight, cage supported by hangers	Injury requiring medical treatment and possibly a lost time injury	Trained First Aider on site, First Aid facilities	Severe	Possible	II	No	An additional trained First Aid person is required on site, e.g. to cover annual leave	Severe	Possible	II
3	Environmental Pollution	Potential for environmental impact from vehicle fuel or oil leaks	Fuel or oil leaks from vehicles, i.e. leaching through the bitumen or entering the stormwater system with the ultimate potential to flow off-site to the local creeks.	Vehicle design and maintenance, vehicles registered, DG licensed drivers, inspected vehicles	Impact to the aquatic life in the local creeks.	Spill kit on DG vehicle, emergency response plan with sand bags and the requirement to close the stormwater isolation valve to the local creeks.	Significant	Possible	III	No	Obtain hydrocarbon spill kits for the site	Significant	Unlikely	III
					Potential for a fine (business impact)		Minor	Possible	III			Minor	Unlikely	III
4	Transport Hazards	Impact from FLT	Driver error. Excessive speed. Poor visibility, e.g. corners of warehouses	All FLT drivers licensed, site speed limit, observations of work practices by management, mirrors on warehouse corners	Injury to personnel	Trained First Aider on site, First Aid facilities	Severe	Possible	II	No	Formalise work practice reviews by management, e.g. via an audit program. Include in the site induction the site speed limit	Severe	Unlikely	III



Table 7-1: Hazard and Risk Register

Event Number	Hazard Identification Guide Word	Hazardous Event	Causes	Prevention Safeguards	Consequences	Mitigation Safeguards	Consequences	Likelihood	Existing Risk Rating	Is the risk ALARP?	Additional Safeguards	Consequence	Likelihood	Residual Risk Rating
					Damage to property, e.g. FLT rollover	Maintenance and repair	Minor	Possible	III	No		Minor	Unlikely	III
5	Transport Hazards	Loss of load whilst using a FLT	Rough floor surface. Tynes piercing containers and packages. Driver error. Excessive speed. Poor visibility	All FLT drivers licensed, site speed limit, observations of work practices by management, mirrors on warehouse corners	Injury to personnel if pallet dropped from a height	Routine maintenance of the roads to fix cracks and holes, trained First Aider on site, First Aid facilities	Ex. Serious	V. Unlikely	III	Yes		Ex. Serious	V. Unlikely	III
					Release of materials leading to environmental impact	Housekeeping and spill response including isolation of the stormwater outlet valve	Severe	Ex. Unlikely	III	Yes		Severe	Ex. Unlikely	III
6	External Fire / Explosion	Warehouse fire	Ignition of packaging (i.e. cardboard), plastic wrap, wooden pallets, wooden structures (Building 1). Vehicles fires. Conveyor fires. Smoking. Lightning strike. Grass fires. Adjacent property fires. Arson. Broken fluorescent light. Appliance fire, e.g. stove in Building 1	Vehicle design and maintenance, licensed FLT drivers, no smoking on site (except in the designated area), hot work permit, landscaping to keep grass level low, security system including fully fenced site, locked gates when facility not in use, smoke detectors within selected buildings	This can result in toxic products of combustion equipment and property damage from radiant heat, missiles (e.g. LPG cylinders), rupturing of containers and contaminated fire water runoff.	Fire sprinkler systems installed, fire water from hydrants, emergency response including off-site evacuations, hand held hoses and extinguishers for small fires	Ex. Serious	Unlikely	II	No	Provide covers over all lights within the warehouse. Provide routine electrical testing for all electrical leads and earth leakage detectors at the site. Incompatible materials should not be stored in the same area.	Ex. Serious	Unlikely	II



Table 7-1: Hazard and Risk Register

Event Number	Hazard Identification Guide Word	Hazardous Event	Causes	Prevention Safeguards	Consequences	Mitigation Safeguards	Consequences	Likelihood	Existing Risk Rating	Is the risk ALARP?	Additional Safeguards	Consequence	Likelihood	Residual Risk Rating
7	Harmful Exposure	Mixing of incompatible materials	Common drainage system where spills could mix. Inadequate housekeeping with multiple spills in a warehouse. FLT collision whilst carrying incompatible material.	Housekeeping and immediate clean-up of a spill, waste water pit contains water and hence dilution occurs, management observation of work practices, licensed FLT drivers, liquid acids stored separately from the hypochlorite materials. Separate Warehouses used with separate bunding for acids and alkali and preventing mixing under all circumstances.	Ultimate impact is harm to people, e.g. inhalation of chlorine which is a toxic gas, and impact to the environment	Evacuation and emergency response when chlorine detected, safety showers	Severe	Unlikely	III	No	As above, review if the incompatible materials can be separated further. As above, provide liquid spill response absorbents and equipment	Severe	Unlikely	III



Table 7-1: Hazard and Risk Register

Event Number	Hazard Identification Guide Word	Hazardous Event	Causes	Prevention Safeguards	Consequences	Mitigation Safeguards	Consequences	Likelihood	Existing Risk Rating	Is the risk ALARP?	Additional Safeguards	Consequence	Likelihood	Residual Risk Rating
			Tanker unloading error.	Tanker connections for acids and alkalis are different sizes. Each connection is also clearly labelled. All pipework is clearly labelled. Plant supervisor present while tanker deliveries of raw material occur. A work procedure is in place. Internal audits of use of procedures in place.	Ultimate impact is harm to people, e.g. inhalation of chlorine which is a toxic gas, and impact to the environment	Evacuation and emergency response when chlorine detected, safety showers	Severe	Unlikely	III	No	No further safeguards needed	Severe	Unlikely	III
					This could also result in off-site impact to people (i.e. adverse public relations)		Serious	Unlikely	III			Serious	Unlikely	III
8	Physical Over / Under Pressure	Solvent container rupture	Blocked vent due to faulty membrane	Store men place containers within the Warehouses.	Spray release of vapour with the potential to harm personnel	Trained First Aider on site, First Aid facilities, safety glasses worn when handling drums	Severe	Unlikely	III	Yes		Severe	Unlikely	III
9	Harmful Exposure	Release of liquid from container		Trained personnel aware if checking all shipments for leaking containers.	Release of solution causing chemical harm to personnel	Trained First Aider on site, First Aid facilities, safety glasses worn, safety showers	Severe	Unlikely	III	Yes		Severe	Unlikely	III



Table 7-1: Hazard and Risk Register

Event Number	Hazard Identification Guide Word	Hazardous Event	Causes	Prevention Safeguards	Consequences	Mitigation Safeguards	Consequences	Likelihood	Existing Risk Rating	Is the risk ALARP?	Additional Safeguards	Consequence	Likelihood	Residual Risk Rating
10	Activity Hazards	Manual handling injuries due to personnel lifting containers and boxes	Inadequate lifting techniques, one person lifting a 40 kg container (a two person activity)	Training program on correct lifting techniques, signage, observations by management, toolbox talks on issues such as correct lifting techniques, job rotation	Injuries, e.g. back injuries, and chemical exposure injuries (skin and eyes). Potential for spillage of solutions.	Medical treatment required	Severe	Probable	II	Yes		Severe	Probable	II
11	Activity Hazards	Personnel exposed to dust	Spill cleaning. Disposing of empty packaging	skin protection via sprayed on barrier cream	Harm to skin, lungs, eyes	Medical treatment required	Minor	Probable	III	No		Minor	Probable	III
12	Violent Release of Energy	Warehouse racking collapse	Impact from FLT. Excessive weight. Corrosion. Fire. Fatigue. Poor lighting in warehouses	Licensed FLT drivers, site speed limit, racking designed for single pallet stacking only, Dexion perform a routine racking audit, job rotation, FLT fitted with lights	Potential for spills within the bunded warehouses and injury to personnel	Medical treatment required	Ex. Serious	V. Unlikely	III	Yes		Ex. Serious	V. Unlikely	III
13	Natural and Other Occurrences	Aircraft crash	Pilot error, plane failure	Aviation standards for aircraft design, maintenance and safe operation	Significant damage and injury toll across the site	Emergency response	Catastrophic	Ex. Unlikely	III	Yes		Catastrophic	Ex. Unlikely	III



Table 7-1: Hazard and Risk Register

Event Number	Hazard Identification Guide Word	Hazardous Event	Causes	Prevention Safeguards	Consequences	Mitigation Safeguards	Consequences	Likelihood	Existing Risk Rating	Is the risk ALARP?	Additional Safeguards	Consequence	Likelihood	Residual Risk Rating
14	Activity Hazards	Lone workers	Activities on site where personnel are working in isolation	Supervisors conduct regular visits to all work areas	In an emergency, assistance may be inadequate	Emergency response	Serious	Possible	II	No	Implement means for detecting when lone workers are in need of emergency assistance	Serious	Unlikely	III
15	Harmful Exposure	Flammable or combustible liquid.	Ignition of packaging (i.e. cardboard), plastic wrap, wooden pallets, wooden structures (Building 1). Vehicles fires. Conveyor fires. Hot work. Smoking. Lightning strike. Grass fires. Adjacent property fires. Arson. Broken fluorescent light. Appliance fire, e.g. stove in Building 1	Vehicle design and maintenance, licensed FLT drivers, no smoking on site (except in the designated area), hot work permit, landscaping to keep grass level low, security system including fully fenced site, locked gates when facility not in use, smoke detectors within selected buildings	Potential to release decomposition products	Fire water from hydrants, emergency response including off-site evacuations, hand held hoses and extinguishers for small fires	Severe	V. Unlikely	III	Yes		Severe	V. Unlikely	III
16	Exposure to Damaging Energy	Electrocution	Contact with electricity due to poor quality electrical lead, damaged conduits, e.g. submersible pump for the waste liquid concrete underground tank	Earth leakage protection on all GPOs	Fatality	Emergency response	Ex. Serious	Unlikely	II	No	As above, implement electrical safety testing	Ex. Serious	V. Unlikely	III
17	Activity Hazards	Contact with moving parts	Stretch wrapping machines	Observations by management, operator training and awareness	Injury if clothing and body caught in the machines	Trained First Aider on-site and First Aid facilities	Severe	Possible	II	No	As above, include formal reviews of machine safety	Severe	Unlikely	III



Table 7-1: Hazard and Risk Register

Event Number	Hazard Identification Guide Word	Hazardous Event	Causes	Prevention Safeguards	Consequences	Mitigation Safeguards	Consequences	Likelihood	Existing Risk Rating	Is the risk ALARP?	Additional Safeguards	Consequence	Likelihood	Residual Risk Rating
18	Violent Release of Energy	Compressed air hose failure	Inadequate connection, hose degradation, coupling failure	Hoses inspected annually and replaced as required, operators respond to leaking hoses for maintenance, low pressure in the hoses, hoses tied when in use	Injury to personnel if struck with a flaying hose	Medical treatment required	Significant	Unlikely	III	Yes		Significant	Unlikely	III
19	Activity Hazards	Confined space entry	Person enters a tank or pit	Work permits	Potential for fatality		Ex. Serious	V. Unlikely	III	No	Review means to prevent people falling through tank manholes. Identify all confined spaces on the site and then produce confined space risk assessments	Ex. Serious	V. Unlikely	III
20	Natural and Other Occurrences	Software theft	Hacking	Firewalls	Loss of company confidential information		Serious	V. Unlikely	III	Yes		Serious	V. Unlikely	III
2. Front Gate Activities														
21	Transport Hazards	Heavy vehicle movement resulting in impact	Heavy vehicle brake failure (i.e. unplanned movement down the slope). Driver error	Modern vehicle design includes brakes being locked when the motor is off	Injury to people and/or damage to equipment (including other vehicles). This could also result in pallets falling off the heavy vehicle resulting in spills and/or injury	Medical treatment	Ex. Serious	V. Unlikely	III	No	Use wheel chocks to prevent trucks rolling down the slope	Ex. Serious	V. Unlikely	III



Table 7-1: Hazard and Risk Register

Event Number	Hazard Identification Guide Word	Hazardous Event	Causes	Prevention Safeguards	Consequences	Mitigation Safeguards	Consequences	Likelihood	Existing Risk Rating	Is the risk ALARP?	Additional Safeguards	Consequence	Likelihood	Residual Risk Rating
22	Transport Hazards	Fork lift truck operations when pallet loaded onto a truck (applies for all similar operations across the site)	Dropping pallets off tynes. Impact with people, heavy vehicle and/or property. Piercing of containers. Pinch hazards	Licensed FLT drivers, site speed limit, observation by management, stretch wrap around the packages on the pallets	Injury to people and/or damage to equipment	Medical treatment	Ex. Serious	V. Unlikely	III	Yes		Ex. Serious	V. Unlikely	III
					Spilt material could cause environmental impact if it flows off-site through the stormwater system	Spill response, stormwater pit outlet isolation valve to be closed in an emergency	Severe	Unlikely	III	Yes		Severe	Unlikely	III
23	Environmental Pollution	Raw materials or products on a vehicle's wheels and driven off-site	Vehicles drive through a spill and material sticks to the wheels of the vehicles	Housekeeping and spill response, small size of the packages limits amount involved, stretch wrapping provides some containment	Potential for materials to pollute the environment when washed into the off-site stormwater drains	Off-site response to contaminants on the roads	Significant	Possible	III	Yes		Significant	Possible	III



8. RECOMMENDATIONS

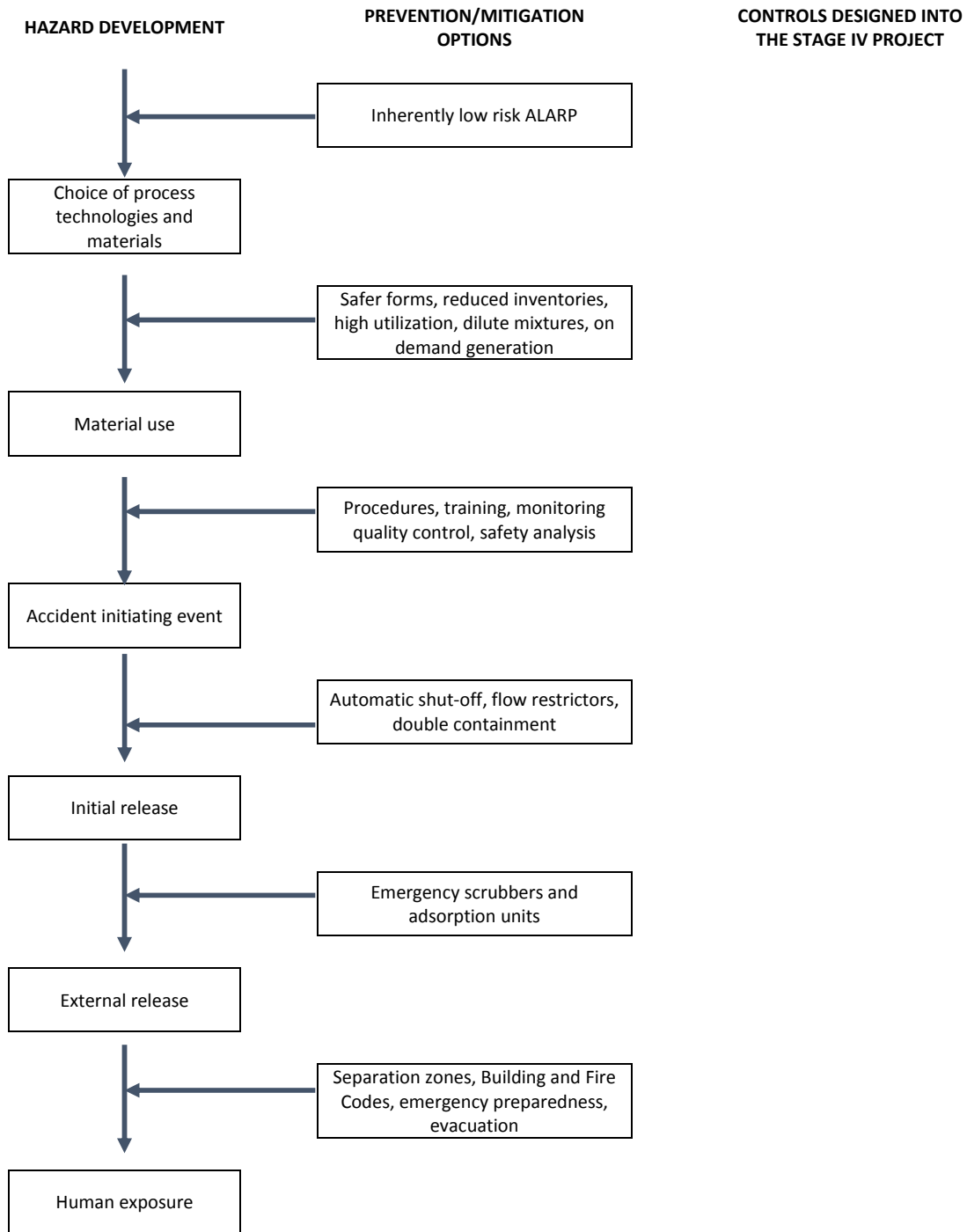
The following safeguards are considered to be fundamental to control hazards presented by the site:

- A fire hydrant system is to be provided in accordance with the NCC and AS 2419.1–2005/Amdt 1-2007;
- A hose reel system is to be provided in accordance with the NCC and AS 2441–2005/Amdt 1-2009;
- Foam injection kits and 20 L of foam need to be installed and training undertaken;
- Fire extinguishers to be provided at the site in accordance with the NCC and AS 2444–2001;
- Fire services at the site are to be maintained in accordance with AS 1851–2012;
- Emergency lighting and exit signage are to be provided in accordance with the NCC and AS 2293;
- An occupant warning system in accordance with the NCC and AS 1670.4–2004;
- A comprehensive Emergency Plan and a Pollution Incident Risk Management Plan need to be developed for the site;
- Specific on-site personnel are to be trained in specific site procedures, emergency procedures and the use of fire extinguishers and hose reels;
- Strict control of ignition sources to be enforced on site;
- Fire alarm and detection system in accordance with Clause 5(b) of specification E2.2a of the BCA and AS 1670.1–2015.
- Fire services as described in the Fire Safety Study;
- The tank farm separated into at least four areas with dividing concrete walls 1.5 m high;
- The external walls of the building constructed to 240/240/240 FRL;
- All access doorways designed to –/180/30 FRL;
- A triple bunding system provided from application of the following approach:
 - ▶ Tank farm bunded to AS 1940–2017;
 - ▶ Tanker unloading/loading area bunded;
 - ▶ Filling area/staging area of filled containers, drums and IBCs bunded;
 - ▶ Building would have bunding; and
 - ▶ Site already has stormwater isolation in place.
- Cooling water on the four acid storage tanks.
- Greater flexibility in the truck routes from the Redox site.
- Movement of trucks and mobile equipment on-site is to be restricted. Site management is to ensure that the necessary timetabling and organisation of contractors is conducted in a manner that accommodates this requirement.
- Low on-site speed limits.
- No use of horns or engine brakes when entering/exiting the site.
- Adequate access road design/maintenance.
- Maintenance of Equipment: It is important to ensure that all vehicles, machinery and ancillary equipment meet the appropriate environmental noise requirements.
- Include adequate fire protection and cooling water to prevent these events causing off site hazards.
- Cooling water to be placed above the Class 8(3) tanks.
- Level indicators near the filling points.
- Level indicators within the PLDC system graphic displays in the control room.
- Level alarms at the desired levels of liquid in the tank.
- High level alarm if this level is exceeded. Alarms are a flashing light and alarm audible within the Stage IV facility.



- The filling line for the acetic and formic acid tanks would both have a shut off valve on the filling line if the high level alarm is activated.
- The overflow pipe on these tanks would be piped into a 100 L pit that is able to be filled with water and used to dilute the spilt liquid.
- The bunded area is able to be fogged using hose reels and as well the tank cooling water is able to be used to provide a large volume of water to cover the spill.
- Accident prevention and mitigation
An effective approach to achieving these twin goals has been developed by specialist industry groups as a consequence of catastrophic spillages of liquids or uncontrolled toxic gas releases.
- Tanker connections for acids and alkalis are different sizes. Each connection is also clearly labelled. All pipework is clearly labelled. Plant supervisor present while tanker deliveries of raw material occur.
- A work procedure is in place. Internal audits of use of procedures is in place.

The following diagram and comparison to the recommendations included in the design of the Stage IV project provides a useful hazard reduction checklist.





9. CONCLUSION

This Preliminary Hazard Analysis (PHA) assessed the redesigned Stage IV development in accordance with the Multi-Level Risk Assessment and Hazardous Industry Planning Advisory Papers (HIPAPs) guidelines stipulated by the Department of Planning and Environment (DoP&E) NSW. The design approach of the proposed development is the reduction and removal of hazards in order to minimise risk to the surrounding sensitive receptors.

The PHA found that the operation of the proposed development readily meets the criteria laid down in HIPAP No. 4 *Risk Criteria for Land Use Safety Planning* and would not cause any risk, significant or minor, to the community, with the recommended safeguards in place.

Throughout the preparation of this PHA, it has been determined that the proposed development meets all the safety requirements stipulated by DoP&E and hence would not be considered to be an offensive or hazardous development.

Prepared by:

A handwritten signature in black ink, appearing to read 'L Zanotto'.

Linda Zanotto
Senior Environmental Engineer

A handwritten signature in black ink, appearing to read 'R T Benbow'.

R T Benbow
Principal Consultant



10. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

This report has been prepared solely for the use of Redox Pty Ltd, as per our agreement for providing environmental services. Only Redox Pty Ltd is entitled to rely upon the findings in the report within the scope of work described in this report. Otherwise, no responsibility is accepted for the use of any part of the report by another in any other context or for any other purpose.

Although all due care has been taken in the preparation of this study, no warranty is given, nor liability accepted (except that otherwise required by law) in relation to any of the information contained within this document. We accept no responsibility for the accuracy of any data or information provided to us by Redox Pty Ltd for the purposes of preparing this report.

Any opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal advice.



11. REFERENCES

AS/NZS 3833:2007 *The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers*

DoP&E 2011

"Applying SEPP 33," January 2011

DoP&E 2011

"Multi-level Risk Assessment," January 2011

DoP&E 2011

"Hazardous Industry Planning Advisory Paper No 4 (HIPAP No. 4) –Risk Criteria for Land Use Safety Planning," January 2011

DoP&E 2011

"Hazardous Industry Planning Advisory Paper No 6 (HIPAP No. 6) –Hazard Analysis," January 2011

IAEA 1996

"Manual for the Classification and Prioritization of Risks due to Major Accidents in Process and Related Industries, Rev 1," International Atomic Energy Agency, November 1996

LPMA 2010

NSW Land and Property Management Authority 2010

NFPA 491M 1991

"Hazardous Chemical Reactions", National Fire Protection Association, 1991 Edition

AS 1670.1–2015 *Fire detection, warning, control and intercom systems – System design, installation and commissioning – Fire*

AS 1670.4–2015 *Fire detection, warning, control and intercom systems – System design, installation and commissioning – Emergency warning and intercom systems*

AS 1851–2012 (Amdt 2016) *Routine service of fire protection systems and equipment*

AS 1940–2017 *The storage and handling of flammable and combustible liquids*

AS 2293–2005 (Set) *Emergency escape lighting and exit signs for buildings*

AS 2419.1–2005 (Amdt 2007) *Fire hydrant installations Part 1: System design, installation and commissioning*

AS 2444–2001 *Portable fire extinguishers and fire blankets – Selection and location*

AS 3780–2008 (Amdt 2009) *The storage and handling of corrosive substances*

AS 2890.1–2004 (Amdt 2005) *Parking facilities Part 1: Off-street car parking*

AS 2890.2–2002 *Parking facilities Part 2: Off-street commercial vehicle facilities*



AS/NZS 3833:2007 *The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers*

AS/NZS 4452:1997 – *The storage and handling of toxic substances*

AS/NZS 4804:2001 – *Occupational health and safety management systems – General guidelines on principles, systems and supporting techniques*

Australian Dangerous Goods (ADG) Code 7th Edition

Environmental Planning and Assessment Act, 1979

Environmental Planning and Assessment Regulation, 2000

EPA, *Environment Protection Authority, Air Quality Monitoring Reports, Data Search Facility, 2011*

Fire Protection Guide to Hazardous Materials NFPA 14th Edition

Globally Harmonised System of Classification and Labelling of Chemicals 4th Revised Edition (2011)

Greater Metropolitan Regional Environmental Plan No. 2 (REP 2)

NSW Government, Environment and Heritage, NSW BioNet Atlas of NSW Wildlife, accessed 28 February 2012 < <http://www.bionet.nsw.gov.au/>>

NSW Environment Protection Authority, *NSW Industrial Noise Policy*, January 2000

NSW Environment Protection Authority, *The Approved Methods for the Modelling and Assessment of Air Pollutant in New South Wales*, NSW Environmental Protection Authority, August 2005

NSW Environment Protection Authority, *Waste Classification Guidelines, Part 1 - Classifying Waste*, April 2008

NSW State Government, *Protection of the Environment Operations Act, 1997*

NSW State Government, *Protection of the Environment Operations (Clean Air) Regulation 2010*

SafeWork Australia – *National Standard for the Storage and Handling of Dangerous Goods* [NOHSC:1015 (2001)]

SafeWork Australia – *National Code of Practice for the Storage and Handling of Dangerous Goods* [NOHSC:2017 (2001)]

SafeWork Australia – *Managing Risks of Hazardous Chemicals in the Workplace* Code of Practice, 2012

State Environmental Planning Policy (Infrastructure) 2007 under the Environmental Planning and Assessment Act, 1979



State Environmental Planning Policy no. 33 – Hazardous and Offensive Development, as at March 1995, under the Environmental Planning and Assessment Act, 1979

State Environmental Planning Policy no. 55 – Remediation of Land, 1998, under the Environmental Planning and Assessment Act, 1979

Work Health and Safety Act 2011

Work Health and Safety Regulation 2017

Dangerous Goods (Road and Rail Transport) Act 2008

Dangerous Goods (Road and Rail Transport) Regulation 2009

How to Manage Work Health and Safety Risks Code of Practice 2011

Vasilis, M. Fthenakis, (1996) Department of Applied Science, Brookhaven National Laboratory, Upton New York. *Approaches for preventing and mitigating accidental gaseous chemical releases*

Sherin, Brian J., (1989) *Risk assessment and control of toxic gas releases* Environmental Health and Safety Specialists, Hewlett Packard Corporation

Moshowitz, P.D, Fthenakis, V.M and Kalb, P.D. (1988) *Preventing and controlling accidental gas releases* AIP Conference Proceedings, p.166.

Manual for the Classification and Prioritization of Risks due to major accidents in process and related industries International Atomic Energy Agency, Vienna (1996)

PHA ATTACHMENTS

Dangerous Goods Stock Manifest

Stock Summary

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Class	Sub. Risks	Pack Group	Quantity Packaged		Quantity Bulk	
			Weight (kg)	Volume (L)	Weight (kg)	Volume (L)
3		II	3,137.476	3,891.047	1.000	1.075
3		III	17,668.162	28,944.471	26.227	27.350
3	6.1	II	1.484	1.873		
3	8	II	2,521.725	3,551.583		
4.1		II	0.700	2.557		
4.1		III	22.450	15.996		
4.2		II	0.270	0.298		
4.2		III	5.000	7.059		
4.3		III	0.400	0.175		
5.1		II	9.090	9.313		
5.1		III	41.750	55.244		
5.1	6.1	II	0.230	0.092		
5.1	6.1	III	97.400	152.680		
5.1	8	II	1.200	1.140		
5.1	8	III	0.800	0.640		
6.1		I	0.200	0.124		
6.1		II	0.010	0.010		
6.1		III	103,804.000	133,888.522		
6.1	8	II	0.300	0.240		
6.1		II	1.050	0.991		
6.1		III	0.450	0.360		
8		II	286,435.323	365,099.296	0.200	0.132
8		III	116,438.801	114,702.780		
8	3	I	0.500	0.499		
8	3	II	17.653	17.332		
8	6.1	II	251.000	300.876		
8	6.1	III	1,080.600	217.064		
8		II	8,710.050	9,939.989		

Dangerous Goods Stock Manifest

Stock Summary

		Location		Date	
		Redox Pty Ltd 4 Holmes Road Minto NSW 2566 Australia		2/11/2016	
				Emergency Contact 1	
				Emergency Contact 2	
8	III	26,978.700	35,302.577		
9	III	1,225.400	1,317.628		
Combustible Liquid (CL)		20,295.422	25,041.047	4.000	5.000

Dangerous Goods Stock Manifest

Stock by Building

Building B1 / ALGLET1500 to OILCEL1025

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ALGLET1500	Alkyl Glycidyl Ether Alkyl Glycidyl Ether	20160429: B14	1.44 tonne 8 x 180 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 68609-97-2 Xi, N	pH	Neutral
ALHYDR5600	Enersol L PETROLEUM DISTILLATES, N.O.S. (ALIPHATIC HYDROCARBON)	2980014: B14	0.8 KLTR 4 x 200 L drums	Class UN Number Poison Sch.	3 1268 5	Sub. Risk(s) Pack Group Hazchem	N/A II 3WE	Physical State CAS Number	Liquid 64742-89-8 F+, Xn, Xi, Carc. 2, Muta. 2	pH	N/A
BRFLUI4600	Brake Fluid Dot 4 (XHD 260) 220kg Drums BRAKE FLUID DOT4	2913148B: B14	0.88 tonne 4 x 220 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 143-22-6 Xi	pH	Alkali
CASODA1300	Caustic Soda Pearl SODIUM HYDROXIDE, SOLID	60301: B14	0.1 tonne 4 x 25 kg bags	Class UN Number Poison Sch.	8 1823 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2W	Physical State CAS Number	Solid 1310-73-2 C	pH	Conc. Str. Alkali
DIPENT1000	Dipentene DIPENTENE	452120215: B14	1.4 tonne 8 x 175 kg drums	Class UN Number Poison Sch.	3 2052 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III 3Y	Physical State CAS Number	Liquid 138-86-3 Xi, N	pH	N/A
DIQUPO2000	ABIL QUAT 3272 Diquaternary Polydimethylsiloxane	E516403685: B12	0.4 tonne 2 x 200 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 13473-05-6	pH	Alkali
DIQUPO2001	ABIL QUAT 3272 Diquaternary Polydimethylsiloxane	E516403672: B12	0.125 tonne 5 x 25 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 13473-05-6	pH	Alkali
DYBARB2700	AUTOMATE Red IK HF - 20kg Dye Automate Red IK HF	YY00FCS130: B11	220 kg 11 x 20 kg pails	Class UN Number Poison Sch.	CL N/A 5	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 71819-51-7 Xn	pH	Neutral
ETGLBE1502	Ethyl Glycol Monobutyl Ether ETHYL GLYCOL MONOBUTYL ETHER	3101695: B14	4.4 tonne 5 x 880 kg IBCs	Class UN Number Poison Sch.	CL N/A 6	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 111-76-2 Xn	pH	N/A
OILCEL1025	Celery Seed Oil "A" - 401/213 Celery seed Oil	3107642: B11	0.025 tonne 5 x 5 kg drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 8015-90-5 Xn	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building B1 / POLYIN4701 to SOLONE5500

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

	Description		Quantity								
Code	Proper Shipping Name	Batch(es) / Area(s)	Packs	Hazard Classification							
POLYIN4701	CHEMCURE 147	3000592771: B13	3049.6 kg	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	Corrosive Liquid, N.O.S. (Contains Diethylenetriamine & Tetraethylenepentamine)		16 x 190.6 kg drums	UN Number	1760	Pack Group	III	CAS Number			
				Poison Sch.	N/A	Hazchem	2X		Xi		
PRGLME9800	Propyleneglycol Monomethyl Ether	3238369: B13	15.2 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	1-METHOXY-2-PROPANOL		80 x 190 kg drums	UN Number	3092	Pack Group	III	CAS Number	107-98-2		
				Poison Sch.	N/A	Hazchem	•2Y				
PTFEAA0600	Dryfilm RA/IPA	3216915: B11	15.88 kg	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	ISOPROPANOL (ISOPROPYL ALCOHOL)		1 x 15.88 kg pails	UN Number	1219	Pack Group	II	CAS Number	Various		
				Poison Sch.	Not schedule d	Hazchem	•2YE		F, Xi		
SOLAET3220	SLES 70% 2EO(N) Low Dioxane	3198246B: B12	0.48 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		2 x 240 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
				Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
SOLONE5500	Shellsol A	2529619: B11	0.2 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	PETROLEUM DISTILLATES, N.O.S.(PETROLEUM NAPHTHA)		1 x 200 L drums	UN Number	1268	Pack Group	III	CAS Number	64742-95-6		
				Poison Sch.	5	Hazchem	3Y		Xn, N		

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / ACACID9800 to CYNONE6800

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

	Description		Quantity								
Code	Proper Shipping Name	Batch(es) / Area(s)	Packs	Hazard Classification							
ACACID9800	Acetic Acid 90% 20 Litre	C02000: CABINET SHELF (Sample)	0.0108 KLTR	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
	ACETIC ACID SOLUTION, more than 80% acid, by mass		0.54 x 20 L drums	UN Number	2789	Pack Group	II	CAS Number	64-19-7		
ACETON0200	Acetone	122341A: CABINET-F4 (Sample)	0.0005 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	ACETONE		0.003125 x 160 kg drums	UN Number	1090	Pack Group	II	CAS Number	67-64-1		
ALHYDR3200	Redsol D30	67949: CABINET-F2 (Sample)	0.00045 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	HYDROCARBON, LIQUID N.O.S (ISONANES AND N-NONANE)		0.002195 x 205 L drums	UN Number	3295	Pack Group	III	CAS Number	64742-48-9		
ALHYDR5200	X55 Solvent (Unmarked)	S13786: CABINET-F2 (Sample)	0.0005 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	PETROLEUM DISTILLATES, N.O.S. (Solvent Naphtha)		0.0025 x 200 L drums	UN Number	1268	Pack Group	II	CAS Number	64742-89-8		
ALHYDR7100	White Spirits	1913021: CABINET C1 (Sample)	0.0005 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	TURPENTINE SUBSTITUTE		0.0025 x 200 L drums	UN Number	1300	Pack Group	III	CAS Number	64742-82-1		
ALHYDR8600	White Spirits 205Ltr Drums	S13536: CABINET-F3 (Sample)	0.0002 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	PETROLEUM DISTILLATES, N.O.S.(CONTAINS WHITE SPIRITS)		0.000975 x 205 L drums	UN Number	1268	Pack Group	II	CAS Number	64742-89-8		
ALHYDR9800	White Spirit (Unmarked)	77563: CABINET-F2 (Sample)	0.0012 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	TURPENTINE SUBSTITUTE		1.2 x 1 L bulk	UN Number	1300	Pack Group	III	CAS Number	64742-82-1		
BUACEI1000	Butyl Acetate Industrial	56136: CABINET-F4 (Sample)	0.00078 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	BUTYL ACETATES		0.004333 x 180 kg drums	UN Number	1123	Pack Group	III	CAS Number	123-86-4		
BUACET1000	Butyl Acetate Urethane Grade	31909: CABINET-F4 (Sample)	0.002 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	BUTYL ACETATES		0.011111 x 180 kg drums	UN Number	1123	Pack Group	III	CAS Number	123-86-4		
BUTANO3001	Butanol Normal	102121: CABINET-F2 (Sample)	0.0003 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	BUTANOLS		0.001796 x 167 kg drums	UN Number	1120	Pack Group	III	CAS Number	71-36-3		
CYNONE6800	Cyclohexanone	86451: CABINET-F1 (Sample)	0.001 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	CYCLOHEXANONE		0.005263 x 190 kg drums	UN Number	1915	Pack Group	III	CAS Number	108-94-1		

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / DEHYAM3001 to DRICOB1500

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
DEHYAM3001	N,N-Diethylhydroxylamine DEHA FLAMMABLE LIQUID, N.O.S. (N,N-DIETHYLHYDROXYLAMINE)	S14856: CABINET-F3 (Sample)	0.0005 tonne 0.002941 x 170 kg drums	Class UN Number Poison Sch.	3 1993 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •3Y	Physical State CAS Number	Liquid 3710-84-7 Xn	pH	Alkali
DEHYAM5000	Diethylhydroxylamine 85% FLAMMABLE LIQUID, N.O.S. (N,N-DIETHYLHYDROXYLAMINE)	L148851: B21	0.185 tonne 1 x 185 kg drums	Class UN Number Poison Sch.	3 1993 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •3Y	Physical State CAS Number	Liquid 3710-84-7 Xn	pH	Alkali
DEMISP4000	SPIRDANE D 40S PETROLEUM DISTILLATES, N.O.S.(Naphtha (Petroleum), Hydrotreated Heavy)	84763: CABINET-F3 (Sample) 84765: CABINET-F1 (Sample)	0.0167 KLTR 16.7 x 1 L bulk	Class UN Number Poison Sch.	3 1268 5	Sub. Risk(s) Pack Group Hazchem	N/A III 3Y	Physical State CAS Number	Liquid 64742-48-9 Xn	pH	N/A
DEMISP6500	SPIRDANE D60 Spirdane D-60	20100640: CABINET-C8 (Sample) 84764: CABINET-C10 (Sample) S15068: CABINET-C10 (Sample)	0.00429 KLTR 0.02145 x 200 L drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 64742-48-9 Xn	pH	N/A
DIACAL1700	Diacetone Alcohol DIACETONE ALCOHOL	70449: CABINET-F3 (Sample)	0.00002 tonne 0.000102 x 195 kg drums	Class UN Number Poison Sch.	3 1148 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III •2Y	Physical State CAS Number	Liquid 123-42-2 Xi	pH	N/A
DIETHY1000	Diethylamine DIETHYLAMINE	2704070: B24 3189493: B23	2.52 tonne 18 x 140 kg drums	Class UN Number Poison Sch.	3 1154 Not schedule d	Sub. Risk(s) Pack Group Hazchem	8 II •2WE	Physical State CAS Number	Liquid 109-89-7 F, C	pH	Alkali
DIGLDI1000	Diethyleneglycol Dim. Ether FLAMMABLE LIQUID N.O.S (DIETHYLENEGLYCOL DIMETHYL ETHER)	S13295: CABINET-F3 (Sample)	0.0006 tonne 0.003076 x 195 kg drums	Class UN Number Poison Sch.	3 1993 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •3Y	Physical State CAS Number	Liquid 111-96-6 Xn, Xi	pH	N/A
DIPGME6500	Dipropyleneglycol Methyl Ether Dipropylene Glycol Monomethyl Ether	107293A: CABINET-C3 (Sample)	0.0003 tonne 0.001578 x 190 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 34590-94-8	pH	N/A
DIQUPO2000	ABIL QUAT 3272 Diquaternary Polydimethylsiloxane	E516303516: B22	0.2 tonne 1 x 200 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 13473-05-6	pH	Alkali
DRICOB1500	Drier - Cobalt Octoate 6% DRIER - COBALT OCTOATE 6%	S12577: CABINET-F4 (Sample)	0.00006 tonne 0.000333 x 180 kg drums	Class UN Number Poison Sch.	CL N/A 5	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid Various N, Xn	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / DYBAGM1000 to ISOPAR4200

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

	Description		Quantity								
Code	Proper Shipping Name	Batch(es) / Area(s)	Packs	Hazard Classification							
DYBAGM1000	AUTOMATE GREEN HFX 20kg Pail	YY00G85270: B22	40 kg	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	2 x 20 kg pails		UN Number	N/A	Pack Group	N/A	CAS Number	64742-94-5			
DYBARB2050	AUTOMATE RED IK HF 4 x 5kg Carton	YY00E7L073: B21	5 each	Poison Sch.	N/A	Hazchem		N/A	Xn, N		
	5 x 1 each cartons		Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	Neutral	
DYBARB2700	AUTOMATE Red IK HF - 20kg	YY00F3K253: B22 YY00FCS130: B22	140 kg	UN Number	N/A	Pack Group	N/A	CAS Number	71819-51-7		
	7 x 20 kg pails		Poison Sch.	5	Hazchem		N/A	Xn			
EPRESA1100	Epoxy Resin KER 1001-X-75	74539: CABINET-F1 (Sample)	0.001 tonne	Class	3	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	0.005 x 200 kg drums		UN Number	1866	Pack Group	III	CAS Number	25036-25-3			
ETALCO1500	95% SG Ethanol Bonded	S13333: CABINET-F2 (Sample)	0.0002 KLTR	Poison Sch.	N/A	Hazchem		•3Y	Xn		
	ETHANOL (ETHYL ALCOHOL) or ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)		0.001 x 200 L drums	Class	3	Sub. Risk(s)		Physical State	Liquid	pH	N/A
ETALCO3000	Ethanol 95 (Bonded)	74163: CABINET-F4 (Sample) 87994: CABINET (Sample)	0.0005 KLTR	UN Number	1170	Pack Group	II	CAS Number	64-17-5		
	ETHANOL (ETHYL ALCOHOL) or ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)		0.0025 x 200 L drums	Poison Sch.	Not scheduled	Hazchem		•2YE	F		
ETETPR3000	Ethyl 3-Ethoxypropionate	136840: CABINET-F3 (Sample)	0.002 tonne	Class	3	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	ESTERS, N.O.S. (ethyl 3-ethoxypropionate)		0.010526 x 190 kg drums	UN Number	3272	Pack Group	III	CAS Number	763-69-9		
ETETPR4000	Ethyl 3-Ethoxypropionate	EEP/201110P16: CABINET C1 (Sample)	0.00075 tonne	Poison Sch.	N/A	Hazchem		•3Y	Xn		
	ESTERS, N.O.S. (ethyl 3-ethoxypropionate)		0.00375 x 200 kg drums	Class	3	Sub. Risk(s)		Physical State	Liquid	pH	N/A
ETGLBE6935	Ethylene Glycol Monobutyl Ether	3229145B: B24	0.54 tonne	UN Number	3272	Pack Group	III	CAS Number	763-69-9		
	ETHYL GLYCOL MONOBUTYL ETHER		3 x 180 kg drums	Poison Sch.	N/A	Hazchem		•3Y	Xn		
ETHYLP1000	N-Ethylpyrrolidone-2	S14778: CABINET-C7 (Sample)	0.0005 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	Alkali
	N-ETHYLPYRROLIDONE-2		0.0025 x 200 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	2687-91-4		
ISOPAR3200	SK Isol-G	C11421: CABINET-F1 (Sample)	0.0002 tonne	Poison Sch.	N/A	Hazchem		N/A	Xi		
	PETROLEUM DISTILLATES, N.O.S. (Naphtha (Petroleum) Hydrotreated Heavy)		0.001351 x 148 kg drums	Class	3	Sub. Risk(s)		Physical State	Liquid	pH	N/A
ISOPAR4200	Isopar H	117272B: CABINET-F1 (Sample)	0.0002 KLTR	UN Number	1268	Pack Group	III	CAS Number	64742-48-9		
	HYDROCARBONS, LIQUID, N.O.S (Naphtha (petroleum), hydrotreated heavy)		0.00098 x 204 L drums	Poison Sch.	5	Hazchem		3Y	Xn, Carc. 2, Muta. 2		
				Class	3	Sub. Risk(s)		Physical State	Liquid	pH	N/A
				UN Number	3295	Pack Group	III	CAS Number	64742-48-9		
				Poison Sch.	5	Hazchem		3Y	Xn, F		

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / ISOPAR5000 to MESPSP2000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity	Hazard Classification							
	Proper Shipping Name		Packs								
ISOPAR5000	Isopar L	L134053: CABINET-C6 (Sample)	0.0005 KLTR	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	ISOPAR L		0.0025 x 200 L drums	UN Number	N/A	Pack Group	N/A	CAS Number	64742-48-9		
ISPRAC1000	Iso Propyl Acetate	61655: CABINET-F1 (Sample)	0.00035 tonne	Poison Sch.	5	Hazchem	N/A	CAS Number	Xn		
	ISOPROPYL ACETATE		0.001944 x 180 kg drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
KEROSE5000	Kerosene - High Flash	S13598: CABINET-SHELF (Sample)	0.005 KLTR	UN Number	1220	Pack Group	II	CAS Number	108-21-4		
	KEROSENE HIGH FLASH POINT		5 x 1 L bulk	Poison Sch.	N/A	Hazchem	•3YE	CAS Number	F+		
KEROSE8100	Kerosene	83903: CABINET-F3 (Sample)	0.0005 KLTR	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	KEROSENE		0.0025 x 200 L drums	UN Number	N/A	Pack Group	N/A	CAS Number	64741-44-2		
LIMONE3094	D-Limonene	3062688: B23	0.692 tonne	Poison Sch.	5	Hazchem	N/A	CAS Number	Xn, N		
	TERPENE HYDROCARBONS, N.O.S. (D-LIMONENE)		4 x 173 kg drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
MEACET2000	Methyl Acetate (Meac) 99.5%	007197: CABINET-F3 (Sample)	0.003 tonne	UN Number	2319	Pack Group	III	CAS Number	8028-48-6		
	METHYL ACETATE		0.015789 x 190 kg drums	Poison Sch.	Not scheduled	Hazchem	3Y	CAS Number	Xn, N		
MEISBU2000	Methyl Iso Butyl Ketone	77462: CABINET-F2 (Sample)	0.00045 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	METHYL ISOBUTYL KETONE		0.002727 x 165 kg drums	UN Number	1245	Pack Group	II	CAS Number	108-10-1		
MEISCA5000	Methyl Isobutyl Carbinol	091228: CABINET-F4 (Sample)	0.001 tonne	Poison Sch.	5	Hazchem	•3YE	CAS Number	F, Xn		
	METHYL ISOBUTYL CARBINOL		0.00625 x 160 kg drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
MEPRAC4000	Methoxypropyl Acetate	142866: CABINET F1 (Sample)	0.001 tonne	UN Number	2053	Pack Group	III	CAS Number	108-11-2		
	ESTERS, N.O.S. (2-METHOXY-1-METHYLETHYL ACETATE, 2-METHOXYPROPYL ACETATE)		0.005 x 200 kg drums	Poison Sch.	N/A	Hazchem	•3Y	CAS Number	Xi		
MEPYRR5100	Methyl-2-Pyrrolidone Min 99.9%	3082292: B24	4.2 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	N-Methyl-2-Pyrrolidone		20 x 210 kg drums	UN Number	3272	Pack Group	III	CAS Number	108-65-6		
MESPIR4000	Methylated Spirits 95%	C24956: CABINET-F1 (Sample)	0.0006 KLTR	Poison Sch.	Not scheduled	Hazchem	•3Y	CAS Number	Xi		
	ETHANOL (ETHYL ALCOHOL)		0.003 x 200 L drums	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	Alkali
MESPSP2000	100% SMS F4 Bonded	C12561: CABINET-F3 (Sample)	0.0004 KLTR	UN Number	N/A	Pack Group	N/A	CAS Number	872-50-4		
	ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)		0.002 x 200 L drums	Poison Sch.	6	Hazchem	N/A	CAS Number	T, Repr. 2		
				Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
				UN Number	1170	Pack Group	II	CAS Number	64-17-5		
				Poison Sch.	5	Hazchem	•2YE	CAS Number	F		
				Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
				UN Number	1170	Pack Group	II	CAS Number	64-17-5		
				Poison Sch.	Not scheduled	Hazchem	•2YE	CAS Number	F, Xi		

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / MESPSP4000 to SOLAET6800

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
MESPSP4000	95% SMS F6 Bonded ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	C17217: CABINET-F1 (Sample)	0.0006 KLTR 0.003 x 200 L drums	Class UN Number Poison Sch.	3 1170 5	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid 64-17-5 F	pH	N/A
METHAN3000	Methanol METHANOL	C03093: CABINET-F (Sample), CABINET-F3 (Sample) SAMPLE: CABINET (Sample)	0.001284 tonne 0.008025 x 160 kg drums	Class UN Number Poison Sch.	3 1230 6	Sub. Risk(s) Pack Group Hazchem	6.1 II •2WE	Physical State CAS Number	Liquid 67-56-1 F, T	pH	N/A
NOPARA0500	Normal Paraffin C5-C6 FLAMMABLE LIQUID, N.O.S (N-PARAFFIN)	S12644: CABINET-C12 (Sample)	0.001 KLTR 0.005 x 200 L drums	Class UN Number Poison Sch.	3 1993 5	Sub. Risk(s) Pack Group Hazchem	N/A II •3YE	Physical State CAS Number	Liquid 8002-74-2 F	pH	N/A
OILORA5500	Oil - Orange TERPENE HYDROCARBONS, N.O.S. (ORANGE OIL)	76627B: CABINET-F1 (Sample)	0.00025 tonne 0.001445 x 173 kg drums	Class UN Number Poison Sch.	3 2319 5	Sub. Risk(s) Pack Group Hazchem	N/A III 3Y	Physical State CAS Number	Liquid 8028-48-6 Xi, N	pH	N/A
OLEBPP1100	Black Pepper Oil - 401/667 Oleoresins - Black Pepper	401F165945: B21	0.01 tonne 1 x 10 kg drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 84929-41-9 Xi	pH	N/A
OLECEL1000	Oleoresin Celery 8% - 401/199 Oleoresin - Celery	401H150544: B21	0.1 tonne 5 x 20 kg drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 89997-35-3 Xi	pH	N/A
PRACET2100	Propyl Acetate NPAC n-PROPYL ACETATE	85319: CABINET-F3 (Sample)	0.0002 tonne 0.001111 x 180 kg drums	Class UN Number Poison Sch.	3 1276 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid 109-60-4 F, Xi	pH	N/A
PRGLME1000	Propyleneglycol Monometh Ether 1-METHOXY-2-PROPANOL	104311: CABINET-F3 (Sample)	0.0006 tonne 0.003243 x 185 kg drums	Class UN Number Poison Sch.	3 3092 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •2Y	Physical State CAS Number	Liquid 107-98-2	pH	N/A
PRGLME7000	Propyleneglycol Monometh Ether 1-METHOXY-2-PROPANOL	77586: CABINET-F2 (Sample)	0.0002 tonne 0.001086 x 184 kg drums	Class UN Number Poison Sch.	3 3092 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •2Y	Physical State CAS Number	Liquid 107-98-2	pH	N/A
PRGLME8000	Propyleneglycol Monometh Ether 1-METHOXY-2-PROPANOL	91730: CABINET-F2 (Sample) 98418: CABINET-F3 (Sample)	0.0003 tonne 0.001578 x 190 kg drums	Class UN Number Poison Sch.	3 3092 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •2Y	Physical State CAS Number	Liquid 107-98-2	pH	N/A
SILSUR7000	Matestab AK-8818 SILICONE SURFACTANT AK-8818	S14550: CABINET-C7 (Sample)	0.00025 tonne 0.00125 x 200 kg drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 68938-54-5	pH	Acid
SOLAET6800	SLES 70% 2EO Natural 170kg drums Sodium Lauryl Ether Sulphate	3187036C: B21	6.8 tonne 40 x 170 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Solid 68891-38-3 Xi, N	pH	Alkali

Dangerous Goods Stock Manifest

Stock by Building

Building B2 / SOLONE7500 to VIPYVE1200

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
SOLONE7500	Solvarex 9S (100)	82173: CABINET-F1 (Sample)	0.008591 tonne	Class 3	Sub. Risk(s) N/A	Physical State	Liquid	pH	N/A		
	PETROLEUM DISTILLATES, N.O.S. (Solvent naphtha (petroleum) light aromatic)		8.591 x 1 kg bulk	UN Number 1268 Poison Sch. 5	Pack Group III Hazchem 3Y	CAS Number	64742-95-6	Xn, N			
SOLVEN3050	Solvent 2026 200L Drums	3195172: B24	0.4 KLTR	Class 3	Sub. Risk(s) N/A	Physical State		pH	N/A		
	PETROLEUM DISTILLATES, N.O.S.		2 x 200 L drums	UN Number 1268 Poison Sch. 6	Pack Group II Hazchem 3YE	CAS Number	Mixture F+, Xn, N				
TEACET2500	Terpinyl Acetate 95%	S14901: CABINET-C2 (Sample)	0.00005 tonne	Class CL	Sub. Risk(s)	Physical State	Liquid	pH	N/A		
	TERPINYL ACETATE		0.00027 x 185 kg drums	UN Number N/A Poison Sch. N/A	Pack Group N/A Hazchem N/A	CAS Number	80-26-2				
TOLUEN5500	Toluene	84419: CABINET-F2 (Sample)	0.001 KLTR	Class 3	Sub. Risk(s) N/A	Physical State	Liquid	pH	N/A		
	TOLUENE		0.005 x 200 L drums	UN Number 1294 Poison Sch. 6	Pack Group II Hazchem 3YE	CAS Number	108-88-3	F, Xn, Repr. 3			
VIPYVE1200	PVP VA73E - 180kg Drums	82057: CABINET-F1 (Sample)	0.0002 tonne	Class 3	Sub. Risk(s) N/A	Physical State	Liquid	pH	N/A		
	RESIN SOLUTION, flammable		0.001111 x 180 kg drums	UN Number 1866 Poison Sch. N/A	Pack Group II Hazchem •3YE	CAS Number	Mixture F				

Dangerous Goods Stock Manifest

Stock by Building

Building C1 / CECHLO6110 to LUBEAD3250

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Description		Batch(es) / Area(s)	Quantity		Hazard Classification						
Code	Proper Shipping Name		Packs								
CECHLO6110	Cetrimonium Chloride 28-30%	3155245: C12	4.439 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (cetrimonium chloride)		23 x 193 kg drums	UN Number	3267	Pack Group	II	CAS Number			
				Poison Sch.	Not schedule d	Hazchem	2X		Xn, N		
LUBEAD3250	VISCOPLEX 0-030 175kg Drum	1408271180: C11	1.225 tonne	Class	9	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	ELEVATED TEMPERATURE LIQUID, N.O.S. (contains MINERAL OIL)		7 x 175 kg drums	UN Number	3257	Pack Group	III	CAS Number			
				Poison Sch.	Not schedule d	Hazchem	2Y				

Dangerous Goods Stock Manifest

Stock by Building

Building C3 / BESOTH2600 to ISDIAM6000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
BESOTH2600	PROXEL GXL CAUSTIC ALKALI LIQUID, N.O.S.(SODIUM HYDROXIDE AND BENZISOTHIAZOLIN-3-ONE)	3808670: C31	0.2 tonne 1 x 200 kg drums	Class UN Number Poison Sch.	8 1719 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2R	Physical State CAS Number	Liquid 2634-33-5 C, Xn, N	pH	Conc. Str. Alkali
CAPOTA1200	Caustic Potash Flk POTASSIUM HYDROXIDE, SOLID	16.05.18: C34	1.1 tonne 44 x 25 kg bags	Class UN Number Poison Sch.	8 1813 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2W	Physical State CAS Number	Solid 1310-58-3 C	pH	Alkali
CAPOTA1300	Caustic Potash Flk 500kg POTASSIUM HYDROXIDE, SOLID	15.02.01: C34 (Reject)	2 tonne 4 x 500 kg bags	Class UN Number Poison Sch.	8 1813 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2W	Physical State CAS Number	Solid 1310-58-3 C	pH	Alkali
CAPOTA1900	Caustic Potash Flake 25kg POTASSIUM HYDROXIDE, SOLID	20160804: C34	8.575 tonne 343 x 25 kg bags	Class UN Number Poison Sch.	8 1813 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2W	Physical State CAS Number	Solid 1310-58-3 C	pH	Alkali
CASODA1100	Caustic Soda Pearl SODIUM HYDROXIDE, SOLID	00416: C36	21 tonne 840 x 25 kg bags	Class UN Number Poison Sch.	8 1823 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2W	Physical State CAS Number	Solid 1310-73-2 C	pH	Conc. Str. Alkali
CASODA5000	Caustic Soda Micropearl SODIUM HYDROXIDE, SOLID	3186420A: C34 3209630A: C34 3222866A: C34	96.675 tonne 3867 x 25 kg bags	Class UN Number Poison Sch.	8 1823 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2W	Physical State CAS Number	Solid 1310-73-2 C	pH	Conc. Str. Alkali
CASODA8200	Caustic Soda Micropearls SODIUM HYDROXIDE, SOLID	3223733A: C34	16.85 tonne 674 x 25 kg bags	Class UN Number Poison Sch.	8 1823 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2W	Physical State CAS Number	Solid 1310-73-2 C	pH	Conc. Str. Alkali
DICHLO1500	Dichlorophene - Liquid CORROSIVE LIQUID, N.O.S. (Contains Sodium Hydroxide)	DCN-L/F/1602001: C31	1.575 tonne 7 x 225 kg drums	Class UN Number Poison Sch.	8 1760 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 97-23-4 C, Xn	pH	Alkali
EDTATL7800	EDTA Tetrasodium Salt 40% Liq CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (contains Tetrasodium EDTA)	3161343B: C31 3194329D: C31 3220535C: C32	12 tonne 12 x 1000 kg IBCs	Class UN Number Poison Sch.	8 3267 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 64-02-8 Xn	pH	Conc. Str. Alkali
ISDIAM6000	Isophorone Diamine ISOPHORONEDIAMINE	3203230: C33	0.9 tonne 5 x 180 kg drums	Class UN Number Poison Sch.	8 2289 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 2855-13-2 C	pH	Alkali

Dangerous Goods Stock Manifest

Stock by Building

Building C3 / LIHYDR2215 to SOMESI3200

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
LIHYDR2215	Lithium Hydroxide Monohydrate LITHIUM HYDROXIDE	3224932: C31	0.25 tonne 10 x 25 kg bags	Class UN Number Poison Sch.	8 2680 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 1310-66-3 C	pH	Conc. Str. Alkali
MEXYDI5000	Meta Xylene Diamine 200kg Drum AMINES, LIQUID, CORROSIVE, N.O.S. (m-XYLENEDIAMINE, 99%)	3110747A: C31	0.8 tonne 4 x 200 kg drums	Class UN Number Poison Sch.	8 2735 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 1477-55-0 C, Xn	pH	Alkali
NONPHE3001	Nonyl Phenol ALKYLPHENOLS, LIQUID, N.O.S. (including C2-C12 homologues)	3196877: C34	9.12 tonne 48 x 190 kg drums	Class UN Number Poison Sch.	8 3145 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 84852-15-3 C, N	pH	Alkali
SOHYDR1150	Sodium Hydrosulphide 900kg SODIUM HYDROSULPHIDE, HYDRATED, with not less than 25% water of crystallization	2727301: C34 (Reject)	1.8 tonne 2 x 900 kg bulkers	Class UN Number Poison Sch.	8 2949 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 16721-80-5 C	pH	Conc. Str. Alkali
SOHYDR2000	Sodium Hydrosulphide Flake SODIUM HYDROSULPHIDE, HYDRATED, with not less than 25% water of crystallization	3136242: C33 3216352A: C34	32.125 tonne 1285 x 25 kg bags	Class UN Number Poison Sch.	8 2949 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 16721-80-5 C	pH	Conc. Str. Alkali
SOMESE3200	Sodium Metasilicate Penta 25kg DISODIUM TRIOXOSILICATE	3214149: C36	40.55 tonne 1622 x 25 kg bags	Class UN Number Poison Sch.	8 3253 5	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 10213-79-3 C	pH	Conc. Str. Alkali
SOMESE4200	Sodium Metasilicate Penta DISODIUM TRIOXOSILICATE	3074315: C34	0.825 tonne 33 x 25 kg bags	Class UN Number Poison Sch.	8 3253 5	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 10213-79-3 C	pH	Conc. Str. Alkali
SOMESE6100	Sodium Metasilicate Penta Fine DISODIUM TRIOXOSILICATE	3208331: C33	19.575 tonne 783 x 25 kg bags	Class UN Number Poison Sch.	8 3253 5	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 10213-79-3 C	pH	Conc. Str. Alkali
SOMESI3200	Sodium Metasilicate Anhydrous DISODIUM TRIOXOSILICATE	3150378: C35	15.9 tonne 636 x 25 kg bags	Class UN Number Poison Sch.	8 3253 5	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 6834-92-0 C	pH	Conc. Str. Alkali

Dangerous Goods Stock Manifest

Stock by Building

Building C3 / SOSULF2900 to TRETTE4000

Location

Redox Pty Ltd
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Date

2/11/2016

Emergency Contact 1

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Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
SOSULF2900	Sodium Sulfide 10ppm SODIUM SULPHIDE, HYDRATED with not less than 30% water	2693859B: C31 (Reject)	0.05 tonne 2 x 25 kg bags	Class UN Number Poison Sch.	8 1849 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 27610-45-3 C, N, T	pH	Conc. Str. Alkali
SOSULF3000	Sodium Sulphide 30ppm SODIUM SULPHIDE, HYDRATED with not less than 30% water	3092289: C36	8 tonne 320 x 25 kg bags	Class UN Number Poison Sch.	8 1849 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 27610-45-3 C, N, T	pH	Conc. Str. Alkali
SUFBIO1002	REWOCID WK 30 CORROSIVE LIQUID, N.O.S. (microbicidal amphoteric surfactants)	3097051: C35	0.41 tonne 2 x 205 kg drums	Class UN Number Poison Sch.	8 1760 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid Various C, N	pH	Alkali
TDMAMP2000	Tri(Dimethylaminomethyl)Phenol AMINES, LIQUID, CORROSIVE N.O.S.(TRIS-2,4,6-(DIMETHYLAMINOMETHYL)PHENOL)	3083482: C31 3183930: C31	5.2 tonne 26 x 200 kg drums	Class UN Number Poison Sch.	8 2735 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 3X	Physical State CAS Number	Liquid 90-72-2 Xn, Xi	pH	Alkali
TDMAMP2001	Tri(Dimethylaminomethyl)Phenol AMINES, LIQUID, CORROSIVE N.O.S.(TRIS-2,4,6-(DIMETHYLAMINOMETHYL)PHENOL)	3094088: C36	11.2 tonne 56 x 200 kg drums	Class UN Number Poison Sch.	8 2735 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 3X	Physical State CAS Number	Liquid 90-72-2 Xn, Xi	pH	Alkali
TOLYLJ2500	Tolyltriazole Liq. 50% IBC CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (Tolytriazole, Sodium Salt)	3190556: C33 3201443: C34	3.6 tonne 3 x 1200 kg IBCs	Class UN Number Poison Sch.	8 3267 N/A	Sub. Risk(s) Pack Group Hazchem	CL III 2X	Physical State CAS Number	Liquid 64665-57-2 C, Xn	pH	Alkali
TRETTE4000	Triethylene Tetramine TRIETHYLENETETRAMINE	3091771: C34	16 tonne 80 x 200 kg drums	Class UN Number Poison Sch.	8 2259 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 112-24-3 C, N	pH	Conc. Str. Alkali

Dangerous Goods Stock Manifest

Stock by Building

Building D1 / ACACID1921 to HYACID1900

Location

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2/11/2016

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Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACACID1921	Acetic Acid 75% ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass	SSBP140108: D12 (Reject)	0.21 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			1 x 210 kg drums	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
ACTEPO2210	Terpolymer XF-3100 CORROSIVE LIQUID, ACIDIC, ORGANIC N.O.S. (Acrylic Acid/2-Acrylamido-2-methylpropanesulfonic Acid Terpolymer)	3246566: D14	0.48 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 240 kg drums	UN Number	3265	Pack Group	II	CAS Number	Xi, C		
AMBIFL1100	Ammonium Bifluoride 98% Min AMMONIUM HYDROGENDIFLUORIDE, SOLID	3180504: D13	3.025 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
			121 x 25 kg bags	UN Number	1727	Pack Group	II	CAS Number	1341-49-7		
FORMAL1810	Formalin 37/7 (APVMA) 20L Carboys FORMALDEHYDE SOLUTION with not less than 25% formaldehyde	3801923: D13	1.68 KLTR	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
			84 x 20 L carboys	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
FORMAL1816	Formalin 37/7 (APVMA) 200L Drums FORMALDEHYDE SOLUTION with not less than 25% formaldehyde	60815AF42: D11 60921AF41: D14	2.2 KLTR	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
			11 x 200 L drums	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
FORMAL8500	Formaldehyde 37/7 (Industrial) 22kg Carboys FORMALDEHYDE SOLUTION with not less than 25% formaldehyde	60921AF41: D14	2.508 tonne	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
			114 x 22 kg carboys	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
FORMAL8600	Formaldehyde 37/7 Industrial (Seajay) 22kg Carboys FORMALDEHYDE SOLUTION with not less than 25% formaldehyde	3808183: D12	3.52 tonne	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
			160 x 22 kg carboys	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
GLACID1010	Glycolic Acid 70% Solution CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Glycolic Acid)	3137906: D12	13.5 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			54 x 250 kg drums	UN Number	3265	Pack Group	II	CAS Number	79-14-1		
HYACID1834	HYDROCHLORIC ACID 33%, 20 litre carboys (One-Way) HYDROCHLORIC ACID	3189417: D13	0.2 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			10 x 20 L carboys	UN Number	1789	Pack Group	II	CAS Number	7647-01-0		
HYACID1900	Hydrochloric Acid 33%, 240 kg Drums HYDROCHLORIC ACID	3133034: D11 3153317: D13	18.24 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			76 x 240 kg drums	UN Number	1789	Pack Group	II	CAS Number	7647-01-0		

Dangerous Goods Stock Manifest

Stock by Building

Building D1 / HYPACI2210 to POPEOX9900

Location

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Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
HYPACI2210	Hypophosphorous Acid 50% Solution CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Hypophosphorous Acid)	2890966E: D14	0.3 tonne 12 x 25 kg carboys	Class UN Number Poison Sch.	8 3264 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 6303-21-5 C	pH	Acid
IODINE1020	Iodine Prill IODINE	3180437: D14	1 tonne 50 x 20 kg drums	Class UN Number Poison Sch.	8 3495 6	Sub. Risk(s) Pack Group Hazchem	6.1 III 2X	Physical State CAS Number	Solid 7553-56-2 Xn, N	pH	Acid
KUAMCO1450	Benzalkonium Chloride 50% Corrosive liquid, Acidic, Organic, N.O.S. (Benzalkonium Chloride, solution, 50%) (Benzalkonium Chloride)	3191520A: D13	6.8 tonne 34 x 200 kg drums	Class UN Number Poison Sch.	8 3265 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 139-07-1 C, N	pH	Acid
LAACID1700	L(+) Lactic Acid 80% FCC - 250kg CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	L1606020519: D14	0.75 tonne 3 x 250 kg drums	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 50-21-5 C	pH	Conc. Str. Acid
LAACID7800	Lactic Acid 80% 25kg Carboys CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	C15039: D11	0.025 tonne 1 x 25 kg carboys	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 50-21-5 C	pH	Conc. Str. Acid
LAACID9600	Lactic Acid Heatstable FCC 88% CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	L1603010297: D11	0.1 tonne 4 x 25 kg carboys	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 50-21-5 C	pH	Conc. Str. Acid
LUBEAD3210	STURACO 7098 208L Drum CORROSIVE LIQUID, N.O.S. (N-TALLOW-1,3- DIAMINOPROPANE, BIS(2-ETHYLHEXYL) HYDROGEN PHOSPHATE)	201511200071: D13	0.832 KLTR 4 x 208 L drums	Class UN Number Poison Sch.	8 1760 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid Mixture	pH	N/A
MAMEAC2500	XF-322W Maleic Acid Copolymer – drums CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Copolymer Of Maleic Anhydride And Acrylic Acid)	2962396C: D14	1 tonne 4 x 250 kg drums	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 113221-69-5 C	pH	Acid
PHACID0200	Phosphoric Acid 85% Food 330kg PHOSPHORIC ACID, SOLUTION	45CX1602016: D14 (Reject)	0.66 tonne 2 x 330 kg drums	Class UN Number Poison Sch.	8 1805 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2R	Physical State CAS Number	Liquid 7664-38-2 C	pH	Conc. Str. Acid
POPEOX9900	Pot Peroxymono Sulphate CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (Potassium Peroxomonosulfate)	3113427A: D11 3214043: D11	15.75 tonne 630 x 25 kg bags	Class UN Number Poison Sch.	8 3260 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Solid 70693-62-8 C	pH	Acid

Dangerous Goods Stock Manifest

Stock by Building

Building D1 / SOBIFL2000 to ZICHLO1850

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
SOBIFL2000	Sodium Bifluoride	81776: D12	0.06 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	SODIUM HYDROGEN-DIFLUORIDE		3 x 20 kg bags	UN Number Poison Sch.	2439 Not schedule d	Pack Group Hazchem	II 2X	CAS Number	1333-83-1 T, C		
SOLAET6800	SLES 70% 2EO Natural 170kg drums	3132105: D12	0.17 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		1 x 170 kg drums	UN Number Poison Sch.	N/A Not schedule d	Pack Group Hazchem	N/A N/A	CAS Number	68891-38-3 Xi, N		
SUACID2000	Sulphamic Acid	2258552: D11 (Reject), D12 (Reject)	0.085 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	SULPHAMIC ACID		3.4 x 25 kg bags	UN Number Poison Sch.	2967 6	Pack Group Hazchem	III 2X	CAS Number	5329-14-6 Xi		
SUACID2050	Sulphamic Acid	3119994: D13	1.075 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	SULPHAMIC ACID		43 x 25 kg bags	UN Number Poison Sch.	2967 6	Pack Group Hazchem	III 2X	CAS Number	5329-14-6 Xi		
SUACID3500	Sulphamic Acid	3107528: D13	3.7 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	SULPHAMIC ACID		148 x 25 kg bags	UN Number Poison Sch.	2967 6	Pack Group Hazchem	III 2X	CAS Number	5329-14-6 Xi		
SUACID3700	Sulphamic Acid	3227297: D13	0.25 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	SULPHAMIC ACID		10 x 25 kg bags	UN Number Poison Sch.	2967 6	Pack Group Hazchem	III 2X	CAS Number	5329-14-6 Xi		
SUACID9000	Sulphamic Acid - 25kg	3222872: D13	19.8 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	SULPHAMIC ACID		792 x 25 kg bags	UN Number Poison Sch.	2967 6	Pack Group Hazchem	III 2X	CAS Number	5329-14-6 Xi		
ZICHLO1100	Zinc Chloride 98%	3158176: D14	0.95 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Acid
	ZINC CHLORIDE, ANHYDROUS		38 x 25 kg bags	UN Number Poison Sch.	2331 6	Pack Group Hazchem	III 2X	CAS Number	7646-85-7 C, N, Xn		
ZICHLO1850	Zinc Chloride	2932527A: D12	0.05 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Acid
	ZINC CHLORIDE, ANHYDROUS		2 x 25 kg bags	UN Number Poison Sch.	2331 6	Pack Group Hazchem	III 2X	CAS Number	7646-85-7 C, N, Xn		

Dangerous Goods Stock Manifest

Stock by Building

Building D2 / BAMETA2500 to SOSILI1500

Location

Redox Pty Ltd
4 Holmes Road
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Date

2/11/2016

Emergency Contact 1

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Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
BAMETA2500	Barium Metaborate BARIUM COMPOUND, N.O.S. (Barium metaborate monohydrate)	3085573: D22	1 tonne 40 x 25 kg bags	Class UN Number Poison Sch.	6.1 1564 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2Z	Physical State CAS Number	Solid 13701-59-2 Xn	pH	Alkali
CAFFEI6200	Caffeine Anhydrous BP/USP ALKALOIDS, SOLID, N.O.S. (Caffeine)	1031601837: D24	0.68 tonne 34 x 20 kg cartons	Class UN Number Poison Sch.	6.1 1544 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 58-08-2 T	pH	N/A
CHMEIS3000	Cmit Min 14% - 250Kg Drums CORROSIVE LIQUID, TOXIC, N.O.S. (5-Chloro-2-methyl-4-isothiazolin-3-one)	3028126B: D23	0.25 tonne 1 x 250 kg drums	Class UN Number Poison Sch.	8 2922 6	Sub. Risk(s) Pack Group Hazchem	6.1 II 2X	Physical State CAS Number	Liquid 26172-55-4 C, N	pH	Acid
DBTOXI1000	Di-N-Butyltinoxide ORGANOTIN COMPOUND, SOLID, N.O.S. (Contains Dibutyltin Oxide)	2844090B: D21 (Reject)	0.05 tonne 2 x 25 kg drums	Class UN Number Poison Sch.	6.1 3146 7	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 818-08-6 T, N, Xi, Muta. 2	pH	N/A
IODINE1020	Iodine Prill IODINE	3013963: D24	0.08 tonne 4 x 20 kg drums	Class UN Number Poison Sch.	8 3495 6	Sub. Risk(s) Pack Group Hazchem	6.1 III 2X	Physical State CAS Number	Solid 7553-56-2 Xn, N	pH	Acid
SOSILI1000	Sodium Silicofluoride SODIUM FLUOROSILICATE	3141851: D24 (Reject)	0.02 tonne 0.8 x 25 kg bags	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1000	Sodium Silicofluoride SODIUM FLUOROSILICATE	3199408: D21 3214387: D22	31 tonne 1240 x 25 kg bags	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1029	Sodium Silicofluoride SODIUM FLUOROSILICATE	3078719: D24 (Reject)	1.8 tonne 72 x 25 kg bags	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1029	Sodium Silicofluoride SODIUM FLUOROSILICATE	3233900: D21	4 tonne 160 x 25 kg bags	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1100	Sodium Silicofluoride SODIUM FLUOROSILICATE	2762159C: D21 (Reject) 2847852: D21 (Reject)	1.902 tonne 1.902 x 1000 kg bulkers	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1100	Sodium Silicofluoride SODIUM FLUOROSILICATE	3141850C: D24	59 tonne 59 x 1000 kg bulkers	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A
SOSILI1500	Sodium Silicofluoride SODIUM FLUOROSILICATE	53892A: D22 (Reject)	0.4 tonne 16 x 25 kg bags	Class UN Number Poison Sch.	6.1 2674 6	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 16893-85-9 T	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building D2 / THIOUR7501 to TRCHLO1020

Location

Redox Pty Ltd
4 Holmes Road
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Date

2/11/2016

Emergency Contact 1

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Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
THIOUR7501	Thiourea Min 99%	L80710: D24	0.025 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	TOXIC SOLID, ORGANIC, N.O.S. (Thiourea)		1 x 25 kg bags	UN Number	2811	Pack Group	III	CAS Number	62-56-6		
TRCHLO1020	Trichloroethylene Superior Grade	3093938: D23	3.92 tonne	Poison Sch.	6	Hazchem	2X		Xn, N		
	TRICHLOROETHYLENE	3155563: D22	14 x 280 kg drums	Class	6.1	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
				UN Number	1710	Pack Group	III	CAS Number	79-01-6		
				Poison Sch.	6	Hazchem	2Z		T, Xi, N, Carc. 2, Muta. 3		

Dangerous Goods Stock Manifest

Stock by Building

Building Default / HEPTAN3080 to LAACID9600

Location

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4 Holmes Road
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Date

2/11/2016

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Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
HEPTAN3080	Heptane Bulk	3229045: Default	0.01 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	HEPTANES		10 x 1 L bulk	UN Number	1206	Pack Group	II	CAS Number	64742-49-0		
LAACID1700	L(+) Lactic Acid 80% FCC - 250kg	L1606130841: Default	3.75 tonne	Poison Sch.	5	Hazchem	3YE		F, Xn, N		
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)		15 x 250 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
LAACID2800	L(+) Lactic Acid 88% - 1200kg	L1606130842: Default	1.2 tonne	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)		1 x 1200 kg IBCs	Poison Sch.	N/A	Hazchem	2X		C		
LAACID4700	Lactic Acid Heatstable FCC 88%	L1606130840: Default	1.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)		1 x 1200 kg IBCs	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
LAACID9600	Lactic Acid Heatstable FCC 88%	L1606130840: Default	0.05 tonne	Poison Sch.	N/A	Hazchem	2X		C		
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)		2 x 25 kg carboys	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
				UN Number	3265	Pack Group	II	CAS Number	50-21-5		
				Poison Sch.	N/A	Hazchem	2X		C		

Dangerous Goods Stock Manifest

Stock by Building

Building E2 / CASODA1800 to CASODA1800

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

	Description		Quantity								
Code	Proper Shipping Name	Batch(es) / Area(s)	Packs		Hazard Classification						
CASODA1800	Caustic Soda Pearl	140641B: E22 (Reject)	0.175 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str.
	SODIUM HYDROXIDE, SOLID		7 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		Alkali
				Poison Sch.	6	Hazchem	2W		C		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / ACACID2700 to ACRACI9000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACACID2700	Acetic Acid 75% IBCs ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass	Sample: 8LA1 (Sample)	0.0008 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.0008 x 1000 kg IBCs	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
ACACID6200	Acetic Acid 45% - 200kg ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass	C03286: 8LA3 (Sample)	0.001 tonne	Poison Sch.	5	Hazchem	2R	C			
			0.005 x 200 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
ACACID6400	Acetic Acid 45% 1000kg IBC ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass	1999345: LAB (Sample)	0.000001 tonne	UN Number	2790	Pack Group	III	CAS Number	64-19-7		
			0.000001 x 1000 kg IBCs	Poison Sch.	5	Hazchem	2R	C			
ACACID6800	Acetic Acid 99.85% Pails ACETIC ACID, GLACIAL	1887262: 4S1 (Sample) 1998750: LAB (Sample) 2514598: LAB (Sample)	0.002113 KLTR	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
			0.140866 x 15 L pails	UN Number	2789	Pack Group	II	CAS Number	64-19-7		
ACACID7400	Acetic Acid 75% 1000kg IBC (One-way) ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass	C14797: 8LA3 (Sample)	0.0006 tonne	Poison Sch.	6	Hazchem	•2P	C			
			0.0006 x 1000 kg IBCs	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
ACACID8000	Acetic Acid 90% 200kg Drum ACETIC ACID SOLUTION, more than 80% acid, by mass	73030: QPBOX (Sample) 73035: QPBOX (Sample)	0.0002 tonne	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
			0.001 x 200 kg drums	Poison Sch.	6	Hazchem	•2P	C, C			
ACACID9800	Acetic Acid 90% 20 Litre ACETIC ACID SOLUTION, more than 80% acid, by mass	2370216: LAB (Sample)	0.000001 KLTR	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
			0.00005 x 20 L drums	UN Number	2789	Pack Group	II	CAS Number	64-19-7		
ACCARB0601	Picaclean SR CORROSIVE SOLID, BASIC, ORGANIC, N.O.S. (Contains Potassium Hydroxide)	S13892: NS33 (Sample)	0.00045 tonne	Poison Sch.	6	Hazchem	•2P	C, C			
			0.018 x 25 kg bags	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
ACCOPO7000	Acrylic Copolymer XF-3211 CORROSIVE LIQUID, N.O.S. (Acrylic Acid/2-acrylamido-2-methylpropanesulfonic Acid Copolymer)	3211100314: 8LB1 (Sample) 3211110722: NL04 (Sample)	0.0015 tonne	UN Number	3263	Pack Group	II	CAS Number	7440-44-0		
			0.00125 x 1200 kg IBCs	Poison Sch.	N/A	Hazchem	2X	C			
ACRACI9000	Acrylic Acid 99.5% Min ACRYLIC ACID, STABILISED	20141210: NL09 (Sample)	0.0003 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	N/A
			0.0015 x 200 kg drums	UN Number	2218	Pack Group	II	CAS Number	79-10-7		
				Poison Sch.	Not schedule d	Hazchem	•2W	C, N			

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / ACTEPO4000 to BESOTH9900

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACTEPO4000	XF-5000 Acrylic and Maleic Polymers CORROSIVE LIQUID, ACIDIC, ORGANIC N.O.S. (Acrylic Acid/2-Acrylamido-2-methylpropanesulfonic Acid Terpolymer)	5000100919: NL02 (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.00016 x 1250 kg IBCs	UN Number Poison Sch.	3265 Not schedule d	Pack Group Hazchem	II 2X	CAS Number	Xi, C		
ACTEPO4100	Terpolymer XF-3100 CORROSIVE LIQUID, ACIDIC, ORGANIC N.O.S. (Acrylic Acid/2-Acrylamido-2-methylpropanesulfonic Acid Terpolymer)	3100110814: NL04 (Sample)	0.0001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.000476 x 210 kg drums	UN Number Poison Sch.	3265 Not schedule d	Pack Group Hazchem	II 2X	CAS Number	Xi, C		
ALGLET1500	Alkyl Glycidyl Ether Alkyl Glycidyl Ether	20120605: LAB (Sample)	0.000111 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	Neutral
			0.000616 x 180 kg drums	UN Number Poison Sch.	N/A Not schedule d	Pack Group Hazchem	N/A N/A	CAS Number	68609-97-2 Xi, N		
ALHYDR2400	White Spirits (Low Aromatic) TURPENTINE SUBSTITUTE	2376960: LAB (Sample)	0.000056 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
			0.000271 x 206 L drums	UN Number Poison Sch.	1300 5	Pack Group Hazchem	III 3Y	CAS Number	64742-82-1 T, N, Carc. 2, Muta. 2		
ALPAST1600	ZQ-6122 Aluminium Paste 325 Mesh ALUMINIUM POWDER, COATED	2514034: 4S1 (Sample)	0.02 tonne	Class	4.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
			0.8 x 25 kg drums	UN Number Poison Sch.	1309 N/A	Pack Group Hazchem	III 4Z	CAS Number	7429-90-5 F, T		
AMAQUE7200	Ammonia Aqueous 25% - 210kg AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia	121087: 8LA2 (Sample)	0.00025 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
			0.00119 x 210 kg drums	UN Number Poison Sch.	2672 6	Pack Group Hazchem	III 2R	CAS Number	1336-21-6 C, N		
AMAQUI7000	Ammonia Aqueous 23% IBC AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia	149144B: QPBOX1 (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
			0.000219 x 910 kg IBCs	UN Number Poison Sch.	2672 6	Pack Group Hazchem	III 2R	CAS Number	1336-21-6 C, N		
AMBIFL1300	Ammonium Bifluoride 98% Min AMMONIUM HYDROGENDIFLUORIDE, SOLID	1868839: NS02 (Sample)	0.0003 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
			0.012 x 25 kg bags	UN Number Poison Sch.	1727 7	Pack Group Hazchem	II 2X	CAS Number	1341-49-7 T+, C		
BEHENT4000	VARISOFT BT 85 Pellets SOLIDS CONTAINING FLAMMABLE LIQUID N.O.S. (contains 2-Propanol)	ST02999707: NS60 (Sample)	0.0006 tonne	Class	4.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
			0.024 x 25 kg drums	UN Number Poison Sch.	3175 N/A	Pack Group Hazchem	II 1Z	CAS Number	Xn, N		
BESOTH9900	Benzisothiazolin-3-One CORROSIVE LIQUID, N.O.S. (1,2-BENZISOTHIAZOLINE-3-ONE)	S14325: 8LB2 (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
			0.001 x 200 kg drums	UN Number Poison Sch.	1760 6	Pack Group Hazchem	III 2X	CAS Number	2634-33-5 Xi		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / BIOCID0900 to CACYAN1200

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
BIOCID0900	Biocide Microcheck MZ 9F CORROSIVE LIQUID, TOXIC, N.O.S	S13919: 8LA2 (Sample)	0.0003 tonne 0.0015 x 200 kg drums	Class UN Number Poison Sch.	8 2922 N/A	Sub. Risk(s) Pack Group Hazchem	6.1 II 2XE	Physical State CAS Number	Liquid 55965-84-9 C	pH	Acid
BIOCID5700	Biocide Microcheck MZ 521 CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (5-CHLORO-2-METHYL-4-ISOTHIASOL-3-ONE	S13494: 8LA3 (Sample)	0.0005 tonne 0.0004 x 1250 kg IBCs	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 55965-84-9	pH	Acid
BORONF3000	Amorphous Boron Powder FLAMMABLE SOLID, INORGANIC, N.O.S. (Boron powder)	1869301: LAB (Sample)	0.0001 tonne 0.006666 x 15 kg pails	Class UN Number Poison Sch.	4.1 3178 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 1Z	Physical State CAS Number	Solid 7440-42-8 Xn, F	pH	N/A
BRCHDI3000	BCDMH 20g Tablet OXIDIZING SOLID CORROSIVE N.O.S (Bromochloro-5,5-dimethylimidazolidine-2,4-dione)	101856: 5S1 (Sample)	0.0008 tonne 0.032 x 25 kg drums	Class UN Number Poison Sch.	5.1 3085 6	Sub. Risk(s) Pack Group Hazchem	8 III 1W	Physical State CAS Number	Solid 32718-18-6 C, O, N	pH	Acid
BRFLUI4600	Brake Fluid Dot 4 (XHD 260) 220kg Drums BRAKE FLUID DOT4	26/1/15: NL14 (Sample)	0.0008 tonne 0.003636 x 220 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	8 N/A N/A	Physical State CAS Number	Liquid 143-22-6 Xi	pH	Alkali
BRHYDR1000	2-bromo-4'-hydroxyacetophenone TOXIC SOLID, CORROSIVE, ORGANIC, N.O.S (2-Bromo-4'-hydroxyacetophenone)	20130520: NS48 (Sample)	0.0003 tonne 0.012 x 25 kg drums	Class UN Number Poison Sch.	6.1 2928 N/A	Sub. Risk(s) Pack Group Hazchem	8 II 2X	Physical State CAS Number	Solid 2491-38-5 T	pH	N/A
BUTYTR1000	Monobutyltintrichloride CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S (Monobutyltintrichloride)	133845: 8LA3 (Sample)	0.0001 tonne 0.002 x 50 kg drums	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 1118-46-3 C	pH	N/A
BUTYTR3000	Monobutyltintrichloride CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S (Monobutyltintrichloride)	134104: 8LA3 (Sample)	0.0002 tonne 0.004 x 50 kg drums	Class UN Number Poison Sch.	8 3265 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 1118-46-3 C	pH	N/A
CAACID1100	Caprylic Acid CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (CAPRYLIC ACID)	3244148: NL02 (Sample)	0.0028 tonne 0.015555 x 180 kg drums	Class UN Number Poison Sch.	8 3265 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 124-07-2 C	pH	N/A
CACYAN1200	Calcium Cyanamide Granular 1200kg CALCIUM CYANAMIDE with more than 0.1% calcium carbide	023140819: NS11 (Sample)	0.0004 tonne 0.000333 x 1200 kg bulkers	Class UN Number Poison Sch.	4.3 1403 6	Sub. Risk(s) Pack Group Hazchem	N/A III 4W	Physical State CAS Number	Solid 156-62-7 Xn	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / CAHYPO8500 to CASODA1007

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CAHYPO8500	Calcium Hypochlorite 70% Gran	2305435: NS68 (Sample)	0.0036 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	CALCIUM HYPOCHLORITE, HYDRATED	77457: 5S2 (Sample)	0.08 x 45 kg drums	UN Number	2880	Pack Group	II	CAS Number	7778-54-3		
	MIXTURE with not less than 5.5% but not more than 16% water	92299: 5S1 (Sample)		Poison Sch.	6	Hazchem	1W		O, C, N		
CAHYPO8900	Calcium Hypochlorite 70% Gran	1908113: NS08 (Sample)	0.0001 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	CALCIUM HYPOCHLORITE, HYDRATED		0.0025 x 40 kg drums	UN Number	2880	Pack Group	II	CAS Number	7778-54-3		
	MIXTURE with not less than 5.5% but not more than 16% water			Poison Sch.	6	Hazchem	1W		O, C, N		
CAHYPO9400	Calcium Hypochlorite 70%	2148341: NS09 (Sample)	0.1 kg	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	CALCIUM HYPOCHLORITE, HYDRATED		0.01 x 10 kg pails	UN Number	2880	Pack Group	II	CAS Number	7778-54-3		
	MIXTURE with not less than 5.5% but not more than 16% water			Poison Sch.	6	Hazchem	1W		O, C, N		
CAHYPO9401	Calcium Hypochlorite 70% (Pool Ranger)	2148351: NS09 (Sample)	0.1 kg	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	CALCIUM HYPOCHLORITE, HYDRATED		0.01 x 10 kg pails	UN Number	2880	Pack Group	II	CAS Number	7778-54-3		
	MIXTURE with not less than 5.5% but not more than 16% water			Poison Sch.	6	Hazchem	1W		O, C, N		
CANITR2200	Calcium Nitrate Tetrahydrate 25kg	2363580: NS11 (Sample)	0.001 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	CALCIUM NITRATE		0.04 x 25 kg bags	UN Number	1454	Pack Group	III	CAS Number	13477-34-4		
				Poison Sch.	N/A	Hazchem	1Z				
CANITR4700	Calcium Nitrate Tetra 99%	105346: 5S2 (Sample)	0.0008 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	CALCIUM NITRATE	133606B: QPBOX2 (Sample)	0.032 x 25 kg bags	UN Number	1454	Pack Group	III	CAS Number	13477-34-4		
				Poison Sch.	N/A	Hazchem	1Z				
CAPOLI1000	Caustic Potash Liquid	SAMPLE: NL17 (Sample)	0.005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	POTASSIUM HYDROXIDE SOLUTION		0.017857 x 280 kg drums	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
				Poison Sch.	6	Hazchem	2R		C		
CAPOLI3000	Caustic Potash Liquid 1490kg	122756B: QPBOX (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	POTASSIUM HYDROXIDE SOLUTION		0.000134 x 1490 kg IBCs	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
				Poison Sch.	6	Hazchem	2R		C		
CAPOTA1900	Caustic Potash Flake 25kg	100222001: 8SA2 (Sample)	0.0017 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	POTASSIUM HYDROXIDE, SOLID		0.068 x 25 kg bags	UN Number	1813	Pack Group	II	CAS Number	1310-58-3		
				Poison Sch.	N/A	Hazchem	2W		C		
CAPOTA2500	Caustic Potash Pellets 25kg	110915: 8SB1 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	POTASSIUM HYDROXIDE, SOLID		0.02 x 25 kg cartons	UN Number	1813	Pack Group	II	CAS Number	1310-58-3		
				Poison Sch.	N/A	Hazchem	2W		C		
CASODA1007	Caustic Soda 99.0% Min Flake	S14273: 8SB1 (Sample)	0.00015 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE, SOLID		0.006 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2W		C		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / CASODA3500 to CECHLO6000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CASODA3500	Caustic Soda Pearl SODIUM HYDROXIDE, SOLID	71280: 8SB1 (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			0.008 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA3600	Caustic Soda Flake SODIUM HYDROXIDE, SOLID	71332: 8SB1 (Sample)	0.0004 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			0.016 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA5000	Caustic Soda Micropearl SODIUM HYDROXIDE, SOLID	2652127B: LAB (Sample)	0.025 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			1 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA6000	Caustic Soda Micropearl 25 kg Bags SODIUM HYDROXIDE, SOLID	82975: 8SB1 (Sample)	0.00025 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			0.01 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA7700	Caustic Soda Flake 99% SODIUM HYDROXIDE, SOLID	99962: 8SB1 (Sample)	0.0001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			0.004 x 25 kg bags	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CAUSOB1000	Caustic Soda Liquid 50% Bulk SODIUM HYDROXIDE SOLUTION	L119511: 8LA3 (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.2 x 1 kg bulk	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD0100	Caustic Soda/Potassium Hydroxide Blend Returnable IBC Corrosive Liquid, Basic, Inorganic NOS (Sodium hydroxide, Potassium hydroxide)	081015: LAB (Sample)	0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.000675 x 1480 kg IBCs	UN Number	3266	Pack Group	II	CAS Number			
CAUSOI0900	Caustic Soda Liq 48.5% 1510kg SODIUM HYDROXIDE SOLUTION	2204599A: 8LA1 (Sample)	0.00025 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.000165 x 1510 kg IBCs	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOI3301	Caustic Soda Liq 32% IBC SODIUM HYDROXIDE SOLUTION	L112475: 8LB1 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.000378 x 1320 kg IBCs	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CECHLO6000	VARISOFT 300 CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (cetrimonium chloride)	JA22B28675: NS62 (Sample) Y114700291: NS70 (Sample)	0.0015 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
			0.008021 x 187 kg drums	UN Number	3267	Pack Group	II	CAS Number			
				Poison Sch.	Not scheduled	Hazchem	2X		Xn, N		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / CERAMS2000 to DOBENZ1801

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CERAMS2000	Ceramasil - Medium CERAMSIL	C18378: 8SB1 (Sample)	0.001 tonne 0.05 x 20 kg pails	Class UN Number Poison Sch.	8 3253 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid	pH	N/A
CHLORT1000	Chloramine T Trihydrate CORROSIVE SOLID, BASIC,ORGANIC, N.O.S. (Chloramine T trihydrate)	01231: NS33 (Sample)	0.0008 tonne 0.032 x 25 kg drums	Class UN Number Poison Sch.	8 3263 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid	pH	Alkali
DBTDLA1000	Dibutyltindilaurate ORGANOTIN COMPOUND, LIQUID, N.O.S. (Contains Dibutyltindilaurate)	15202613: NL10 (Sample) 15205010/1: 6L1 (Sample) 15205510: 6L1 (Sample) S14388: 6L1 (Sample)	0.00105 tonne 0.042 x 25 kg drums	Class UN Number Poison Sch.	6.1 2788 7	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid	pH	Neutral
DBTOX1000	Di-N-Butyltinoxide ORGANOTIN COMPOUND, SOLID, N.O.S. (Contains Dibutyltin Oxide)	06022310: 6S1 (Sample) S14388: 6S1 (Sample)	0.0001 tonne 0.004 x 25 kg drums	Class UN Number Poison Sch.	6.1 3146 7	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid	pH	N/A
DEMISP8301	Solvent YK-D80 Hydrocarbons, C11-C14, n-alkanes, isoalkanes, cyclics, <2% aromatics	1980395: NL06 (Sample)	0.0008 KLTR 0.004 x 200 L drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid	pH	N/A
DIBRNI4000	DBNPA TOXIC SOLID, ORGANIC, N.O.S. (2,2-Dibromo-3- Nitrilo-Propionamide)	55971F: 6S1 (Sample)	0.00045 tonne 0.018 x 25 kg drums	Class UN Number Poison Sch.	6.1 2811 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid	pH	Acid
DICECH1000	VARISOFT 432 CG FLAMMABLE LIQUID, CORROSIVE, N.O.S. (Isopropanol quaternary ammonium compounds)	JA01724896: NS61 (Sample)	0.001725 tonne 0.009745 x 177 kg drums	Class UN Number Poison Sch.	3 2924 N/A	Sub. Risk(s) Pack Group Hazchem	8 II •3WE	Physical State CAS Number	Liquid	pH	N/A
DIPENT2000	Dipentene 90% DIPENTENE	2111258: LAB (Sample)	0.000044 tonne 0.00022 x 200 kg drums	Class UN Number Poison Sch.	3 2052 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III 3Y	Physical State CAS Number	Liquid	pH	N/A
DIQUPO2000	ABIL QUAT 3272 Diquaternary Polydimethylsiloxane	E515602503: NS70 (Sample)	0.0005 tonne 0.0025 x 200 kg drums	Class UN Number Poison Sch.	CL N/A Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid	pH	Alkali
DISOSU7100	REWOPOL SB DO 75 ETHANOL SOLUTION	S0105210150: NS71 (Sample) Y114800397: NS70 (Sample)	0.00045 tonne 0.00225 x 200 kg drums	Class UN Number Poison Sch.	3 1170 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III •2Y	Physical State CAS Number	Liquid	pH	N/A
DOBENZ1801	LABS ACID 210kg drums ALKYLSULPHONIC ACIDS, LIQUID with not more than 5% free sulphuric acid	TK130813: 8LB2 (Sample)	0.0045 tonne 0.021428 x 210 kg drums	Class UN Number Poison Sch.	8 2586 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid	pH	Acid

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / DOBENZ6801 to ETGLMH0800

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
DOBENZ6801	L.A.B.S.A min 96% 1100kg IBC ALKYLSULPHONIC ACIDS, LIQUID with not more than 5% free sulphuric acid	J1A140210-8: 8LA1 (Sample)	0.0002 tonne 0.000181 x 1100 kg IBCs	Class UN Number Poison Sch.	8 2586 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid 68584-22-5 C, N	pH	Acid
DOPYRR2000	N-Dodecyl-2-Pyrrolidone CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (N-DODECYL-2-PYRROLIDONE)	74892: 8LB1 (Sample)	0.0015 tonne 0.008333 x 180 kg drums	Class UN Number Poison Sch.	8 3267 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 2687-96-9 C, N	pH	Alkali
DRYaid1010	CARSPRAY 300 CARSPRAY300	J014300606: NL05 (Sample) J014902270: NL10 (Sample)	0.0013 tonne 0.007344 x 177 kg drums	Class UN Number Poison Sch.	3 1219 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2YE	Physical State CAS Number	Liquid Mixture F, Xi	pH	N/A
DTPAAC1000	DTPA.5Na CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (Diethylenetriaminepentaacetic acid pentasodium salt, Sodium hydroxide)	62710: 8LB1 (Sample) S13240: 8LB1 (Sample)	0.00155 tonne 0.0062 x 250 kg drums	Class UN Number Poison Sch.	8 3267 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid Various Xi	pH	Alkali
DTPAAC4000	DTPA 5Na 40% CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (Diethylenetriaminepentaacetic acid pentasodium salt, Sodium hydroxide)	1879924: 8LA1 (Sample)	0.0015 tonne 0.006 x 250 kg drums	Class UN Number Poison Sch.	8 3267 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid Various Xi	pH	Alkali
ETACET1100	Ethyl Acetate 99.5% Min ETHYL ACETATE	143344A: QPBOX1 (Sample)	0.0001 tonne 0.000555 x 180 kg drums	Class UN Number Poison Sch.	3 1173 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II •3YE	Physical State CAS Number	Liquid 141-78-6 F, Xi	pH	N/A
ETALCO3000	Ethanol 95 (Bonded) ETHANOL (ETHYL ALCOHOL) or ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	2719517: LAB (Sample) Sample: LAB (Sample)	1.892123 KLTR 9.460615 x 200 L drums	Class UN Number Poison Sch.	3 1170 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid 64-17-5 F	pH	N/A
ETETPR6000	Ethyl 3-Ethoxypropionate FLAMMABLE LIQUID, N.O.S. (Ethyl-3-Ethoxypropionate)	2651930: LAB (Sample) 2758396: LAB (Sample) SAMPLE: LAB (Sample)	0.001022 tonne 0.005241 x 195 kg drums	Class UN Number Poison Sch.	3 1993 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A III •3Y	Physical State CAS Number	Liquid 763-69-9	pH	N/A
ETGLBE6938	Ethylene Glycol Monobutyl Ether ETHYL GLYCOL MONOBUTYL ETHER	3160867: LAB (Sample)	0.0002 tonne 0.001111 x 180 kg drums	Class UN Number Poison Sch.	CL N/A 6	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 111-76-2 Xn	pH	N/A
ETGLMH0800	Cellosolve Solvent 907kg IBC CORROSIVE LIQUID, TOXIC, N.O.S (ETHYLENE GLYCOL MONOHEXYL ETHER)	91222: 8LA2 (Sample)	0.4 kg 0.000441 x 907 kg IBCs	Class UN Number Poison Sch.	8 2922 N/A	Sub. Risk(s) Pack Group Hazchem	6.1 II 2XE	Physical State CAS Number	Liquid 112-25-4 C, Xn	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / ETSILI3000 to HEXANE4000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

	Description			Quantity							
Code	Proper Shipping Name	Batch(es) / Area(s)		Packs		Hazard Classification					
ETSILJ3000	Ethyl Silicate	82991: QPBOX (Sample)	0.00025 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	TETRAETHYL SILICATE		0.00125 x 200 kg drums	UN Number	1292	Pack Group	III	CAS Number	11099-06-2		
				Poison Sch.	N/A	Hazchem	3Y		Xn		
FASOFT8001	VARISOFT SEA	Y114B00730: NL05 (Sample)	0.00045 tonne	Class	4.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	FLAMMABLE SOLID ORGANIC, N.O.S. (Isopropanol solution)		0.002368 x 190 kg drums	UN Number	1325	Pack Group	III	CAS Number			
				Poison Sch.	N/A	Hazchem	1Z		N		
FERCHL6000	Ferrous Chloride 31-33% Soln	75688: 8LA2 (Sample)	0.0006 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Ferrous Chloride Solution)		0.000428 x 1400 kg IBCs	UN Number	3264	Pack Group	II	CAS Number	7758-94-3		
				Poison Sch.	5	Hazchem	2X		C		
FERSUL9900	Ferric Sulphate Liquid IBC	L133328: 8LA3 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	CORROSIVE LIQUID N.O.S (FERRIC SULPHATE)		0.000316 x 1580 kg IBCs	UN Number	1760	Pack Group	II	CAS Number	10028-22-5		
				Poison Sch.	5	Hazchem	2X		C, Xi		
FORMIC3700	Formic Acid 85% 1200kg IBC	133952: QPBOX1 (Sample)	0.0036 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
	FORMIC ACID with more than 85% acid by mass		0.003 x 1200 kg IBCs	UN Number	1779	Pack Group	II	CAS Number	64-18-6		
				Poison Sch.	5	Hazchem	●2W		C		
GLACIC2510	Glycolic Acid 70% Cosmetic Grade	20151011: NL08 (Sample)	0.00025 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC N.O.S. (GLYPURE HUGH PURITY ACID)		0.001 x 250 kg drums	UN Number	3265	Pack Group	II	CAS Number	79-14-1		
				Poison Sch.	6	Hazchem	2X		C		
GLUTER6000	Glutaraldehyde 50% Industry Gr	13082306: 8LA1 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (GLUTARALDEHYDE 50%)		0.002272 x 220 kg drums	UN Number	3265	Pack Group	II	CAS Number	111-30-8		
				Poison Sch.	6	Hazchem	2X		T, N, C		
GLUTER7000	Glutaraldehyde 50% Ind.Grd IBC	13052003: LAB (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (GLUTARALDEHYDE 50%)	13061201: LAB (Sample)	0.000454 x 1100 kg IBCs	UN Number	3265	Pack Group	II	CAS Number	111-30-8		
				Poison Sch.	6	Hazchem	2X		T, N, C		
GUACAI5200	Cerospray G	601.955: NSF12 (Sample)	0.0004 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Acid
	Gum Acacia (Gum Arabic)		0.016 x 25 kg bags	UN Number	N/A	Pack Group	N/A	CAS Number	9000-01-5		
				Poison Sch.	Not schedule d	Hazchem	N/A				
HEGLYC0600	Hexylene Glycol	136673: QPBOX1 (Sample)	0.0022 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
	Hexylene Glycol	154388: LAB (Sample)	0.011282 x 195 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	107-41-5		
				Poison Sch.	Not schedule d	Hazchem	N/A		Xi		
HEXANE4000	Hexane - Drums	2286185: LAB (Sample)	0.001962 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	HEXANES	2312327: LAB (Sample)	0.00981 x 200 L drums	UN Number	1208	Pack Group	II	CAS Number	64742-49-0		
				Poison Sch.	5	Hazchem	3YE		F, Xn, N		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / HYPERO6000 to LAACID2700

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
HYPERO6000	Hydrogen Peroxide 50% 25kg	C04764: QPBOX1 (Sample)	0.0002 tonne	Class	5.1	Sub. Risk(s)	8	Physical State	Liquid	pH	Conc. Str. Acid
	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)		0.008 x 25 kg carboys	UN Number	2014	Pack Group	II	CAS Number	7722-84-1		
HYSULP2500	Hydroxylamine Sulphate 99% Min	20100502: 8SA1 (Sample)	0.0009 tonne	Poison Sch.	6	Hazchem	2P	CAS Number	O, C		
	HYDROXYLAMINE SULPHATE		0.036 x 25 kg bags	Poison Sch.	Not schedule d	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
				UN Number	2865	Pack Group	III	CAS Number	10039-54-0		
				Poison Sch.		Hazchem	2X		E, N, Xn, Carc. 3		
IMIDAZ3000	Imidazole	S14229: 8SA2 (Sample)	0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Neutral
	CORROSIVE SOLID, BASIC, ORGANIC N.O.S. (IMIDAZOLE)		0.04 x 25 kg drums	UN Number	3263	Pack Group	III	CAS Number	288-32-4		
IODINE1000	Iodine ACS - Prilled	107167A: 8SA1 (Sample)	0.0001 tonne	Poison Sch.	N/A	Hazchem	2X		Xn, C		
	IODINE		0.004 x 25 kg cartons	Class	8	Sub. Risk(s)	6.1	Physical State	Solid	pH	Acid
IODINE1800	Iodine ACS - Prilled	150864A: 8SA1 (Sample)	0.0005 tonne	UN Number	3495	Pack Group	III	CAS Number	7553-56-2		
	IODINE		0.01 x 50 kg drums	Poison Sch.	6	Hazchem	2X		Xn, N		
ISOPAR3901	SK-ISOL G	1926096: LAB (Sample)	0.000027 KLTR	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	PETROLEUM DISTILLATES, N.O.S. (Naphtha (Petroleum) Hydrotreated Heavy)		0.000135 x 200 L drums	UN Number	1268	Pack Group	III	CAS Number	64742-48-9		
ISOPAR5006	Isopar L	2515251: NL08 (Sample)	0.0005 KLTR	Poison Sch.	5	Hazchem	3Y		Xn, Carc. 2, Muta. 2		
	ISOPAR L		0.0025 x 200 L drums	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
KEROSE5100	Shellsol 2046 - Drums	SAMPLE: LAB (Sample)	0.000113 KLTR	UN Number	N/A	Pack Group	N/A	CAS Number	64742-48-9		
	KEROSENE HIGH FLASH POINT		0.000565 x 200 L drums	Poison Sch.	5	Hazchem	N/A		Xn		
KUAMCO1450	Benzalkonium Chloride 50%	3008477: LAB (Sample)	0.00005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	Corrosive liquid, Acidic, Organic, N.O.S. (Benzalkonium Chloride, solution, 50%) (Benzalkonium Chloride)		0.00025 x 200 kg drums	UN Number	3265	Pack Group	II	CAS Number	139-07-1		
LAACID2600	L(+) Lactic Acid 88% - 25kg	L091228916: 8LA3 (Sample) L1104160468: QPBOX1 (Sample)	0.0003 tonne	Poison Sch.	6	Hazchem	2X		C, N		
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)		0.012 x 25 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
LAACID2700	L(+) Lactic Acid 88% - 250kg	L1104160468: 8LA1 (Sample)	0.0002 tonne	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)		0.0008 x 250 kg drums	Poison Sch.	N/A	Hazchem	2X		C		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / LAACID2900 to MALEAC1500

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
LAACID2900	L(+) Lactic Acid 88% - 25kg CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	CO2490: 8LA1 (Sample)	0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.04 x 25 kg carboys	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
LAACID4100	DI (-) Lactic Acid 88% CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	L090219103: 8LA2 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.000416 x 1200 kg IBCs	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
LAACID4600	Lactic Acid Heatstable FCC 88% CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	101510A: 8LA2 (Sample) S14775: 8LA1 (Sample)	0.00035 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.0014 x 250 kg drums	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
LAACID5101	Lactic Acid 88% 25kg CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)	74148: 8LA1 (Sample)	0.0002 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.008 x 25 kg carboys	UN Number	3265	Pack Group	II	CAS Number	50-21-5		
LIHYDR2200	Lithium Hydroxide Mono LITHIUM HYDROXIDE	127582: 8SA2 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
			0.02 x 25 kg bags	UN Number	2680	Pack Group	II	CAS Number	1310-66-3		
LIMONE1830	d-Limonene TERPENE HYDROCARBONS, N.O.S. (D-LIMONENE)	12082006: NL01 (Sample)	0.00075 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
			0.004411 x 170 kg drums	UN Number	2319	Pack Group	III	CAS Number	8028-48-6		
LIMONE5800	Limonene-D TERPENE HYDROCARBONS, N.O.S. (D-LIMONENE)	IAAC001730: LAB (Sample)	0.000005 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
			0.000028 x 173 kg drums	UN Number	2319	Pack Group	III	CAS Number	8028-48-6		
MAANH4401	Maleic Anhydride Briquettes MALEIC ANHYDRIDE or MALEIC ANHYDRIDE, MOLTEN	95874A: 8SA1 (Sample)	0.0004 tonne	Class	8	Sub. Risk(s)	N/A	Physical State		pH	N/A
			0.016 x 25 kg bags	UN Number	2215	Pack Group	III	CAS Number	108-31-6		
MAANH6100	Maleic Anhydride - 25kg Bag MALEIC ANHYDRIDE or MALEIC ANHYDRIDE, MOLTEN	74142: 8SA2 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State		pH	N/A
			0.02 x 25 kg bags	UN Number	2215	Pack Group	III	CAS Number	108-31-6		
MALEAC1500	Maleic Acid Powder CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S (MALEIC ACID)	155243: LAB (Sample) PUAS011-T: 8SA1 (Sample)	0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Acid
			0.04 x 25 kg bags	UN Number	3261	Pack Group	III	CAS Number	110-16-7		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / MEACET2015 to NICHLO5501

Location

Redox Pty Ltd
4 Holmes Road
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Date

2/11/2016

Emergency Contact 1

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Code	Description	Batch(es) / Area(s)	Quantity	Hazard Classification							
	Proper Shipping Name		Packs	Class	UN Number	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Neutral
MEACET2015	Methyl Acetate Bulk METHYL ACETATE	2940870: NL08 (Sample)	0.001 tonne 1 x 1 kg bulk	Class UN Number Poison Sch.	3 1231 N/A	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid 79-20-9 F, Xi	pH	Neutral
MECHLO8100	Methylene Chloride 99.8% Min DICHLOROMETHANE	133202A: 6S1 (Sample)	0.0005 tonne 0.001851 x 270 kg drums	Class UN Number Poison Sch.	6.1 1593 5	Sub. Risk(s) Pack Group Hazchem	N/A III 2Z	Physical State CAS Number	Liquid 75-09-2 Xn, Carc. 3	pH	N/A
MEETHY5100	Methyl Ethyl Ketoxime (MEKO) METHYL ETHYL KETOXIME	067: NL14 (Sample)	0.00025 tonne 0.001315 x 190 kg drums	Class UN Number Poison Sch.	CL N/A N/A	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 96-29-7 Xn	pH	N/A
MEPYRR1100	N-Methylpyrrolidone Dist. N-Methyl-2-Pyrrolidone	20160701106: NL10 (Sample)	0.001 tonne 0.004761 x 210 kg drums	Class UN Number Poison Sch.	CL N/A 6	Sub. Risk(s) Pack Group Hazchem	N/A N/A N/A	Physical State CAS Number	Liquid 872-50-4 T, Repr. 2	pH	Alkali
MESPSP2500	Methylated Spirits 100% F4 SMS ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	2829765: LAB (Sample)	0.0002 KLTR 0.001 x 200 L drums	Class UN Number Poison Sch.	3 1170 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid 64-17-5 F, Xi	pH	N/A
MESPSP7500	100 F3 SMS (Bonded) ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	SAMPLE: LAB (Sample)	0.756834 KLTR 3.78417 x 200 L drums	Class UN Number Poison Sch.	3 1170 5	Sub. Risk(s) Pack Group Hazchem	N/A II •2YE	Physical State CAS Number	Liquid F	pH	N/A
METHAN3000	Methanol METHANOL	C03093: QPBOX1 (Sample)	0.0001 tonne 0.000625 x 160 kg drums	Class UN Number Poison Sch.	3 1230 6	Sub. Risk(s) Pack Group Hazchem	6.1 II •2WE	Physical State CAS Number	Liquid 67-56-1 F, T	pH	N/A
METHAN3300	Methanol METHANOL	C27510: QPBOX (Sample)	0.0001 tonne 0.000625 x 160 kg drums	Class UN Number Poison Sch.	3 1230 6	Sub. Risk(s) Pack Group Hazchem	6.1 II •2WE	Physical State CAS Number	Liquid 67-56-1 F, T	pH	N/A
MEXYDI2000	Meta Xylene Diamine AMINES, LIQUID, CORROSIVE, N.O.S. (m-XYLENEDIAMINE, 99%)	96446: 8LB2 (Sample)	0.0002 tonne 0.001 x 200 kg drums	Class UN Number Poison Sch.	8 2735 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid 1477-55-0 C, Xn	pH	Alkali
MORPHO4000	Morpholine MORPHOLINE	117710: 8LA2 (Sample)	0.0005 tonne 0.0025 x 200 kg drums	Class UN Number Poison Sch.	8 2054 N/A	Sub. Risk(s) Pack Group Hazchem	3 I •2W	Physical State CAS Number	Liquid 110-91-8 C	pH	Alkali
NICHLO5500	Nickel Chloride 25kg TOXIC SOLID, INORGANIC, N.O.S.(Nickelous Chloride, 6-Hydrate)	09100251: NS21 (Sample)	0.0005 tonne 0.02 x 25 kg bags	Class UN Number Poison Sch.	6.1 3288 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 7718-54-9 T	pH	Acid
NICHLO5501	Nickel Chloride 25kg TOXIC SOLID, INORGANIC, N.O.S.(Nickelous Chloride, 6-Hydrate)	09100251: NS27 (Sample)	0.0001 tonne 0.004 x 25 kg bags	Class UN Number Poison Sch.	6.1 3288 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Solid 7718-54-9 T	pH	Acid

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / NICHLS1000 to PHOACI8010

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
NICHLS1000	Nickel Chloride 12% Solution	C01071: 6L2 (Sample)	0.0002 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	TOXIC LIQUID, INORGANIC, N.O.S.(Nickelous Chloride 12%)		0.000187 x 1065 kg IBCs	UN Number	3287	Pack Group	III	CAS Number	7791-20-0		
NISODA1000	Nitrate Of Soda	120302: 5S2 (Sample)	0.00045 tonne	Poison Sch.	N/A	Hazchem	2X	Physical State	Solid	pH	Neutral
	SODIUM NITRATE	58020: 5S2 (Sample)	0.018 x 25 kg bags	UN Number	1498	Pack Group	III	CAS Number	7631-99-4		
NISODA5300	Nitrate Of Soda Prilled	103027: 5S3 (Sample)	0.0019 tonne	Poison Sch.	N/A	Hazchem	1Z	Physical State	Solid	pH	Neutral
	SODIUM NITRATE		0.0019 x 1000 kg bulkers	UN Number	1498	Pack Group	III	CAS Number	7631-99-4		
NISODA8500	Nitrate Of Soda Prilled	68572A: 5S2 (Sample)	0.0002 tonne	Poison Sch.	N/A	Hazchem	1Z	Physical State	Solid	pH	Neutral
	SODIUM NITRATE		0.008 x 25 kg bags	UN Number	1498	Pack Group	III	CAS Number	7631-99-4		
OCPYRR2000	N-Octyl-2-Pyrrolidone	10456956PO: 8LB1 (Sample)	0.002 tonne	Poison Sch.	N/A	Hazchem	2X	Physical State	Solid	pH	Neutral
	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (contains 1-OCTYL-2-PYRROLIDINONE)		0.011111 x 180 kg drums	UN Number	3267	Pack Group	II	CAS Number	2687-94-7		
OILCEL1000	Celery Seed Oil "A" - 401/3321	100000131223: NSF23 (Sample)	0.00032 tonne	Poison Sch.	N/A	Hazchem	2X	Physical State	Liquid	pH	Alkali
	Celery seed Oil	1160012648/10: LAB (Sample)	0.032 x 10 kg drums	UN Number	8	Pack Group	II	CAS Number	2687-94-7		
OLEBPP1000	Oleoresin Black Pepper 40/20 - 401/603	1160006977/10: NSF22 (Sample)	0.00107 tonne	Class	CL	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	Oleoresins - Black Pepper		0.0535 x 20 kg pails	UN Number	N/A	Pack Group	N/A	CAS Number	84929-41-9		
PAFORM4000	Paraformaldehyde 91-93% Prills	S10262: LAB (Sample)	0.0004 tonne	Poison Sch.	N/A	Hazchem	N/A	Physical State	Solid	pH	N/A
	PARAFORMALDEHYDE		0.016 x 25 kg bags	UN Number	4.1	Pack Group	N/A	CAS Number	30525-89-4		
PHACID0200	Phosphoric Acid 85% Food 330kg	14121201-2: 8LA1 (Sample)	0.0009 tonne	Poison Sch.	6	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	PHOSPHORIC ACID, SOLUTION		0.002727 x 330 kg drums	UN Number	2213	Pack Group	III	CAS Number	30525-89-4		
PHACID0300	Phosphoric Acid 85% Food 1700kg One-Way IBC	11030501-3: 8LA1 (Sample)	0.0002 tonne	Poison Sch.	6	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	PHOSPHORIC ACID, SOLUTION		0.000117 x 1700 kg IBCs	UN Number	8	Pack Group	III	CAS Number	7664-38-2		
PHACID8702	Phosphoric Acid 81% FCC 1600kg	14121405-3: 8LA1 (Sample)	0.001 tonne	Poison Sch.	6	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	PHOSPHORIC ACID, SOLUTION		0.000625 x 1600 kg IBCs	UN Number	8	Pack Group	III	CAS Number	7664-38-2		
PHOACI8010	Phosphorous Acid 98.5% min	20150626: NS03 (Sample)	0.0004 tonne	Poison Sch.	6	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	PHOSPHOROUS ACID		0.016 x 25 kg bags	UN Number	1805	Pack Group	III	CAS Number	7664-38-2		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / PHTRME1000 to POPERM8300

Location

Redox Pty Ltd
4 Holmes Road
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Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
PHTRME1000	Phenyltrimethylammonium Chloride	APTMA 11010: MEL (Sample)	0.0003 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	TOXIC SOLID, ORGANIC, N.O.S. (Phenyl Trimethyl Ammonium Chloride)	APTMA 11011: MEL (Sample) APTMA 11012: MEL (Sample)	0.012 x 25 kg drums	UN Number Poison Sch.	2811 N/A	Pack Group Hazchem	III 2X	CAS Number	138-24-9 T		
PINOIL1800	Pine Oil 65% Special Grade	1928688: LAB (Sample)	0.000278 tonne	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	PINE OIL		0.001544 x 180 kg drums	UN Number Poison Sch.	1272 5	Pack Group Hazchem	III 3Y	CAS Number	8002-09-3 Xi		
POBIFL1800	Potassium Bifluoride 99% Min	120320: 6S1 (Sample)	0.0003 tonne	Class	8	Sub. Risk(s)	6.1	Physical State	Solid	pH	Conc. Str. Acid
	POTASSIUM HYDROGEN DIFLUORIDE, SOLID	120321: 6S1 (Sample)	0.012 x 25 kg bags	UN Number Poison Sch.	1811 7	Pack Group Hazchem	II 2X	CAS Number	7789-29-9 T, C		
POHEBI5000	Polyhexamethylene Biguamide	S0909241401: NS37 (Sample)	0.00005 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	Acid
	POLYHEXAMETHYLENE BIGUANIDE HYDROCHLORIDE		0.00024 x 208 kg drums	UN Number Poison Sch.	N/A Not scheduled	Pack Group Hazchem	N/A N/A	CAS Number	27083-27-8 Xi, N		
PONITR1215	Potassium Nitrate powder with anticake	2326734: 4S1 (Sample)	0.0016 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE	Sample: LAB (Sample)	0.064 x 25 kg bags	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
PONITR1217	Potassium Nitrate 1-3mm Prill	2943813: LAB (Sample)	0.0245 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE		0.98 x 25 kg bags	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
PONITR2900	Potassium Nitrate + Anticake	116498A: 5S2 (Sample)	0.0002 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE		0.008 x 25 kg bags	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
PONITR6700	Potassium Nitrate Prills 25kg	63636B: 5S1 (Sample)	0.0001 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE		0.004 x 25 kg bags	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
PONITR7000	Potassium Nitrate Fine Prill	140727: QPBOX2 (Sample)	0.002 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE	2305630A: 5S1 (Sample)	0.08 x 25 kg bags	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
PONITR7200	Potassium Nitrate Fine Prill	133687A: QPBOX2 (Sample)	0.008 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM NITRATE		0.006666 x 1200 kg bulkers	UN Number Poison Sch.	1486 N/A	Pack Group Hazchem	III 1Z	CAS Number	7757-79-1 O		
POPEOX9900	Pot Peroxymono Sulphate	L132435: 8SA1 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (Potassium Peroxomonosulfate)		0.02 x 25 kg bags	UN Number Poison Sch.	3260 6	Pack Group Hazchem	II 2X	CAS Number	70693-62-8 C		
POPERM8300	Pot. Permanganate USP Code C	S14639: 5S1 (Sample)	0.0003 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	POTASSIUM PERMANGANATE		0.012 x 25 kg drums	UN Number Poison Sch.	1490 6	Pack Group Hazchem	II 1Y	CAS Number	7722-64-7 O, Xn, N		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / PPGMYR6000 to SOETXA9600

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
PPGMYR6000	TEGOSOFT PBE	JA02C28888: NS70 (Sample)	0.00025 tonne	Class	CL	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	Tegosoft PBE		0.001295 x 193 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	9003-13-8		
PRACID1000	Propionic Acid	02F0102801: 8LA3 (Sample)	0.002 tonne	Poison Sch.	N/A	Hazchem	N/A				
	PROPIONIC ACID		0.01 x 200 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
PRGALL3000	Propyl Gallate EP	PG/02/15: NS12 (Sample)	0.00001 tonne	UN Number	1848	Pack Group	III	CAS Number	79-09-4		
	TOXIC SOLID, ORGANIC, N.O.S. (PROPYL GALLATE)		0.0004 x 25 kg bags	Poison Sch.	6	Hazchem	•2W		Xi, C		
PRGLME9800	Propyleneglycol Monomethyl Ether	153227: LAB (Sample)	0.000005 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	1-METHOXY-2-PROPANOL		0.000026 x 190 kg drums	UN Number	2811	Pack Group	II	CAS Number	121-79-9		
SILWAX4000	ABIL WAX 9801	E516503777: NS70 (Sample)	0.0005 tonne	Poison Sch.	N/A	Hazchem	2XE		T, Xi		
	Abil Wax 9801		0.002777 x 180 kg drums	Class	3	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
SOBICH0700	Sodium Bichromate Anh	92365: 6S1 (Sample)	0.00023 tonne	UN Number	3092	Pack Group	III	CAS Number	107-98-2		
	OXIDIZING SOLID, TOXIC, N.O.S.(SODIUM BICHROMATE)		0.0092 x 25 kg bags	Poison Sch.	N/A	Hazchem	•2Y				
SOCHIT8100	Sodium Chlorite 31% w/w Solution IBC	14102015: 8LA1 (Sample)	0.001 tonne	Class	CL	Sub. Risk(s)	N/A	Physical State	Liquid	pH	N/A
	CHLORITE SOLUTION		0.002777 x 180 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	191044-49-2		
SODIIS2200	SDIC 60% 8-30 Mesh - 50kg Drum	84183A: 5S2 (Sample)	0.00023 tonne	Poison Sch.	Not scheduled	Hazchem	N/A				
	DICHLOROISOCYANURIC ACID, SALTS		0.0008 x 1250 kg IBCs	Class	5.1	Sub. Risk(s)	6.1	Physical State	Solid	pH	Acid
SODIIS9000	SDIC Anhydrous Granular 20-60	64299A: 5S2 (Sample)	0.00025 tonne	UN Number	3087	Pack Group	II	CAS Number	10588-01-9		
	DICHLOROISOCYANURIC ACID, SALTS		0.005 x 50 kg drums	Poison Sch.	6	Hazchem	2W		O, T+, N		
SODIME2000	Sod Dimethyldithiocarbamate	129192: 8LB1 (Sample)	0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
	CAUSTIC ALKALI LIQUID, N.O.S. (Sodium dimethyldithiocarbamate)		0.0008 x 1250 kg IBCs	UN Number	1908	Pack Group	II	CAS Number	7758-19-2		
SOETXA9600	S.E.X. Pellets 850kg Crates	20110610: LAB (Sample)	0.00025 tonne	Poison Sch.	5	Hazchem	2X		T, C, N		
	XANTHATES		0.005882 x 850 kg crates	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
		20110615: LAB (Sample)	0.00084 tonne	UN Number	2465	Pack Group	II	CAS Number	2893-78-9		
			0.0168 x 50 kg drums	Poison Sch.	6	Hazchem	1W		Xn, N, O		
			0.0002 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
			0.000166 x 1200 kg IBCs	UN Number	2465	Pack Group	II	CAS Number	2893-78-9		
				Poison Sch.	6	Hazchem	1W		Xn, N, O		
				Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
				UN Number	1719	Pack Group	II	CAS Number	128-04-1		
				Poison Sch.	Not scheduled	Hazchem	2R		C, N		
				Class	4.2	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
				UN Number	3342	Pack Group	III	CAS Number	140-90-9		
				Poison Sch.	N/A	Hazchem	1Y		Xn		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / SOFLUO1301 to SOLUTB2000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
SOFLUO1301	Sodium Fluoride Powder	93924: 6S1 (Sample)	0.0003 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Neutral
	SODIUM FLUORIDE, SOLID		0.012 x 25 kg bags	UN Number	1690	Pack Group	III	CAS Number	7681-49-4		
SOFLUO2900	Sodium Fluoride 98% Granular	S14725: 6S1 (Sample)	0.0005 tonne	Poison Sch.	6	Hazchem	2Z		T		
	SODIUM FLUORIDE, SOLID		0.02 x 25 kg bags	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Neutral
SOLAET1500	SLES 24-2NS/70	121256E: NL06 (Sample)	0.0002 tonne	UN Number	1690	Pack Group	III	CAS Number	7681-49-4		
	Sodium Lauryl Ether Sulphate		0.002 x 1000 kg IBCs	Poison Sch.	6	Hazchem	2Z		T		
SOLAET1800	SLES 24-2NS/70	121256E: NL06 (Sample)	0.002 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		0.002 x 1000 kg IBCs	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
SOLAET1800	SLES 24-3NS/70	2379: NL20 (Sample)	0.002 tonne	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
	Sodium Lauryl Ether Sulphate		0.020476 x 210 kg drums	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
SOLAET4500	SLES 70% 2EO IBC	8012033007: NL01 (Sample)	0.0043 tonne	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
	Sodium Lauryl Ether Sulphate		0.000727 x 1100 kg IBCs	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
SOLAET4500	SLES 70% 2EO IBC	8012033007: NL01 (Sample)	0.0008 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		0.000727 x 1100 kg IBCs	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
SOLAET4600	SLES 70% 3EO	5011121901: NS03 (Sample)	0.00015 tonne	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
	Sodium Lauryl Ether Sulphate		0.000882 x 170 kg drums	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
SOLAET4600	SLES 70% 3EO	5011121901: NS03 (Sample)	0.00015 tonne	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
	Sodium Lauryl Ether Sulphate		0.000882 x 170 kg drums	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
SOLAET4800	SLES 70% 2EO Natural	109385: NL07 (Sample)	0.0002 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		0.00125 x 160 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
SOLAET4800	SLES 70% 2EO Natural	109385: NL07 (Sample)	0.0002 tonne	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
	Sodium Lauryl Ether Sulphate		0.00125 x 160 kg drums	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
SOLAET8600	SLES 24-3NS/27 Drums	2409: NL20 (Sample)	0.004 tonne	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
	Sodium Lauryl Ether Sulphate		0.019047 x 210 kg drums	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
SOLAET8600	SLES 24-3NS/27 Drums	2409: NL20 (Sample)	0.004 tonne	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
	Sodium Lauryl Ether Sulphate		0.019047 x 210 kg drums	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
SOLAET8600	SLES 24-3NS/27 Drums	2409: NL20 (Sample)	0.004 tonne	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
	Sodium Lauryl Ether Sulphate		0.019047 x 210 kg drums	Class	CL	Sub. Risk(s)		Physical State	Solid	pH	Alkali
SOLUTB2000	Solution B	C24690: 5L1 (Sample)	0.001 tonne	UN Number	N/A	Pack Group	N/A	CAS Number	68891-38-3		
	OXIDISING LIQUID, CORROSIVE, N.O.S. (PEROXIDE BLEND)		0.000833 x 1200 kg IBCs	Poison Sch.	Not schedule d	Hazchem	N/A		Xi, N		
SOLUTB2000	Solution B	C24690: 5L1 (Sample)	0.001 tonne	Class	5.1	Sub. Risk(s)	8	Physical State	Liquid	pH	N/A
	OXIDISING LIQUID, CORROSIVE, N.O.S. (PEROXIDE BLEND)		0.000833 x 1200 kg IBCs	UN Number	3098	Pack Group	II	CAS Number	7722-84-1		
SOLUTB2000	Solution B	C24690: 5L1 (Sample)	0.001 tonne	Poison Sch.	5	Hazchem	2P		O, C		
	OXIDISING LIQUID, CORROSIVE, N.O.S. (PEROXIDE BLEND)		0.000833 x 1200 kg IBCs	Class	5.1	Sub. Risk(s)	8	Physical State	Liquid	pH	N/A

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / SOMESI5800 to SOPERC6700

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

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Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
SOMESI5800	Sodium Metasilicate Anh Gran DISODIUM TRIOXOSILICATE	106386B: 8SB1 (Sample)	0.00035 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str.
			0.014 x 25 kg bags	UN Number	3253	Pack Group	III	CAS Number	6834-92-0		Alkali
SOMOAC2500	Sod. Monochloro Acetate 98.5% SODIUM CHLOROACETATE	90082: 6S1 (Sample)	0.0008 tonne	Poison Sch.	5	Hazchem	2X		C		
			0.032 x 25 kg bags	UN Number	2659	Pack Group	III	CAS Number	3926-62-3		
SOMOAC3000	Sod Monochloro Acetate SODIUM CHLOROACETATE	92632: 6S1 (Sample)	0.00025 tonne	Poison Sch.	N/A	Hazchem	2Z		T, N, Repr. 2		
			0.0125 x 20 kg bags	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
SOMOAC5000	Sod Monochloro Acetate SODIUM CHLOROACETATE	130681: 6S1 (Sample)	0.0008 tonne	UN Number	2659	Pack Group	III	CAS Number	3926-62-3		
			0.04 x 20 kg bags	Poison Sch.	N/A	Hazchem	2Z		T, N, Repr. 2		
SONITF3000	Sodium Nitrite FCC SODIUM NITRITE	1027537801: 4S1 (Sample)	25 kg	Class	5.1	Sub. Risk(s)	6.1	Physical State	Solid	pH	Alkali
			1 x 25 kg cartons	UN Number	1500	Pack Group	III	CAS Number	7632-00-0		
SONITF3100	Sodium Nitrite FCC SODIUM NITRITE	102879B: 5S1 (Sample)	0.1 kg	Poison Sch.	7	Hazchem	1Z		O, T, N		
			0.004 x 25 kg cartons	Class	5.1	Sub. Risk(s)	6.1	Physical State	Solid	pH	Alkali
SONITR2000	Sodium Nitrite HQ - Technical SODIUM NITRITE	2153654: 5S1 (Sample)	0.0003 tonne	UN Number	1500	Pack Group	III	CAS Number	7632-00-0		
			0.012 x 25 kg bags	Poison Sch.	7	Hazchem	1Z		O, T, N		
SONITR9100	Sodium Nitrite - No Anticaking SODIUM NITRITE	3097601: 4S1 (Sample)	0.05 tonne	Class	5.1	Sub. Risk(s)	6.1	Physical State	Solid	pH	Alkali
			2 x 25 kg bags	UN Number	1500	Pack Group	III	CAS Number	7632-00-0		
SONITR9600	Sodium Nitrite Prilled SODIUM NITRITE	97167: 5S3 (Sample)	0.022 tonne	Poison Sch.	7	Hazchem	1Z		O, T, N		
			0.88 x 25 kg bags	Class	5.1	Sub. Risk(s)	6.1	Physical State	Solid	pH	Alkali
SOPERC4400	Sodium Percarbonate Coated SODIUM CARBONATE PEROXYHYDRATE	1877951: 5S1 (Sample)	0.001 tonne	UN Number	1500	Pack Group	III	CAS Number	7632-00-0		
			0.04 x 25 kg bags	Poison Sch.	7	Hazchem	1Z		O, T, N		
SOPERC4600	Sodium Percarbonate Tablet SODIUM CARBONATE PEROXYHYDRATE	41HY14-156: 5S1 (Sample)	0.0006 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
			0.024 x 25 kg cartons	UN Number	3378	Pack Group	II	CAS Number	15630-89-4		
SOPERC6500	Sodium Percarbonate Coated SODIUM CARBONATE PEROXYHYDRATE	117691C: 5S2 (Sample)	0.0005 tonne	Poison Sch.	6	Hazchem	1Y		O, Xn, Xi		
			0.000454 x 1100 kg bulkers	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
SOPERC6700	Sodium Percarbonate Coated SODIUM CARBONATE PEROXYHYDRATE	124358: 5S1 (Sample) 126420: 5S1 (Sample)	0.0013 tonne	UN Number	3378	Pack Group	II	CAS Number	15630-89-4		
			0.052 x 25 kg bags	Poison Sch.	6	Hazchem	1Y		O, Xn, Xi		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / SOPERM6500 to THDIOX3000

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
SOPERM6500	Sodium Perborate Monohydrate	S12857: 5S2 (Sample)	0.001 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	SODIUM PERBORATE MONOHYDRATE		0.04 x 25 kg bags	UN Number	3377	Pack Group	III	CAS Number	10332-33-9		
SOSELA1200	Sodium Selenate Ag Grade	S13893: 6S1 (Sample)	0.0002 tonne	Poison Sch.	N/A	Hazchem	1Z		O, T		
	SELENATES		0.008 x 25 kg drums	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
SOSELC1500	Sil Sel 1% RBP	87265: 6S1 (Sample)	0.00016 tonne	UN Number	2630	Pack Group	I	CAS Number	13410-01-0		
	TOXIC SOLID, INORGANIC, N.O.S. (Contains Sodium Selenite)		0.0064 x 25 kg bags	Poison Sch.	7	Hazchem	2X		T, N		
SOSILI1000	Sodium Silicofluoride	109224: 6S1 (Sample)	0.0003 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
	SODIUM FLUOROSILICATE		0.012 x 25 kg bags	UN Number	2674	Pack Group	III	CAS Number	16893-85-9		
SOSILI1100	Sodium Silicofluoride	104824L: 6S1 (Sample) 117576A: 6S1 (Sample)	0.00074 tonne	Poison Sch.	6	Hazchem	2X		T		
	SODIUM FLUOROSILICATE		0.00074 x 1000 kg bulkers	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
SOSILI5000	Sodium Silicofluoride	82303: 6S1 (Sample)	0.00015 tonne	UN Number	2674	Pack Group	III	CAS Number	16893-85-9		
	SODIUM FLUOROSILICATE		0.006 x 25 kg bags	Poison Sch.	6	Hazchem	2X		T		
STAMID1000	Stearamidopropyl Dimethylamine	S0908171731: NS42 (Sample)	0.0004 tonne	Class	9	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. Stearamidopropyl Dimethylamine		0.026666 x 15 kg bags	UN Number	3077	Pack Group	III	CAS Number	7651-02-7		
SUFBIO1000	REWOCID WK 30	ES63A02817: NS70 (Sample)	0.00075 tonne	Poison Sch.	N/A	Hazchem	2Z				
	CORROSIVE LIQUID, N.O.S. (microbicidal amphoteric surfactants)		0.003658 x 205 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
SULACI1917	SULPHURIC ACID 70% 200L Drums	2382143: LAB (Sample)	0.038648 KLTR	UN Number	1760	Pack Group	II	CAS Number	Various		
	SULPHURIC ACID with more than 51% acid		0.19324 x 200 L drums	Poison Sch.	N/A	Hazchem	2X		C, N		
SULPHU0200	Sulphur Ultraventilated Oil1%	100989: 4S1 (Sample) 71800: NS55 (Sample)	0.0015 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	SULPHUR		0.06 x 25 kg bags	UN Number	1830	Pack Group	II	CAS Number	7664-93-9		
SULPHU1400	Rgs Regular Sulphur Pwd 25kg	112936B: LAB (Sample)	0.0001 tonne	Poison Sch.	6	Hazchem	2P		C		
	SULPHUR		0.004 x 25 kg bags	Class	4.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
THDIOX3000	Thiourea Dioxide - 25kg Bags	86604: 4S1 (Sample)	0.00007 tonne	UN Number	1350	Pack Group	III	CAS Number	7704-34-9		
	THIOUREA DIOXIDE		0.0028 x 25 kg bags	Poison Sch.	N/A	Hazchem	1Z		Xi		
				Class	4.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
				UN Number	1350	Pack Group	III	CAS Number	7704-34-9		
				Poison Sch.	N/A	Hazchem	1Z		Xi		
				Class	4.2	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
				UN Number	3341	Pack Group	II	CAS Number	1758-73-2		
				Poison Sch.	6	Hazchem	1Y		Xn, Xi		

Dangerous Goods Stock Manifest

Stock by Building

Building Lab / THDIOX4000 to ZICHLO3300

Location

Redox Pty Ltd
4 Holmes Road
Minto NSW 2566
Australia

Date

2/11/2016

Emergency Contact 1

Mick O'Brien (+61-412459322)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
THDIOX4000	Thiourea Dioxide 95% Min THIOUREA DIOXIDE	78885: 4S1 (Sample)	0.0001 tonne	Class	4.2	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
			0.004 x 25 kg bags	UN Number	3341	Pack Group	II	CAS Number	1758-73-2		
THDIOX5000	Thiourea Dioxide 90% Min THIOUREA DIOXIDE	78886: 4S1 (Sample)	0.0001 tonne	Poison Sch.	6	Hazchem	1Y		Xn, Xi		
			0.004 x 25 kg bags	Class	4.2	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
THIOUR7000	Thiourea TOXIC SOLID, ORGANIC, N.O.S. (Thiourea)	133039: 6S1 (Sample) 136514: 6S1 (Sample)	0.001 tonne	UN Number	3341	Pack Group	II	CAS Number	1758-73-2		
			0.04 x 25 kg bags	Poison Sch.	6	Hazchem	1Y		Xn, Xi		
TRCHIS6501	TCCA-200g Tabs (1kg Soft Inner) TRICHLOROISOCYANURIC ACID, DRY	82298B: 5S2 (Sample)	0.001 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
			0.04 x 25 kg bags	UN Number	2811	Pack Group	III	CAS Number	62-56-6		
VAPENT8100	Vanadium Pentoxide Granular VANADIUM PENTOXIDE, non-fused form	78930: 6S1 (Sample)	0.001 tonne	Poison Sch.	6	Hazchem	2X		Xn, N		
			0.008 x 50 kg drums	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
VITDCA2100	Vitamin D3 500 VITAMIN D3	S14639: NSF04 (Sample)	0.0004 tonne	UN Number	2468	Pack Group	II	CAS Number	87-90-1		
			0.008 x 50 kg drums	Poison Sch.	N/A	Hazchem	1W		O, Xn, N		
ZICHLO0300	Zinc Chloride 98% Min ZINC CHLORIDE, ANHYDROUS	S14887: 8SA2 (Sample)	0.0003 tonne	Class	6.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
			0.001875 x 160 kg drums	UN Number	2862	Pack Group	III	CAS Number	1314-62-1		
ZICHLO2600	Zinc Chloride ZINC CHLORIDE, ANHYDROUS	110547: 8SA1 (Sample)	0.2 kg	Poison Sch.	N/A	Hazchem	2X		T, N, Muta. 3, Repr. 3		
			0.008 x 25 kg drums	Class	CL	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid
ZICHLO3300	Zinc Chloride Pwd 98.5% Min ZINC CHLORIDE, ANHYDROUS	S14887: 8SA2 (Sample)	0.0005 tonne	UN Number	N/A	Pack Group	N/A	CAS Number	Mixture		
			0.02 x 25 kg bags	Poison Sch.	Not schedule d	Hazchem	N/A				
ZICHLO2600	Zinc Chloride ZINC CHLORIDE, ANHYDROUS	110547: 8SA1 (Sample)	0.0005 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Acid
			0.016 x 25 kg bags	UN Number	2331	Pack Group	III	CAS Number	7646-85-7		
ZICHLO3300	Zinc Chloride Pwd 98.5% Min ZINC CHLORIDE, ANHYDROUS	S14887: 8SA2 (Sample)	0.0004 tonne	Poison Sch.	6	Hazchem	2X		C, N, Xn		
			0.001 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Acid
ZICHLO3300	Zinc Chloride Pwd 98.5% Min ZINC CHLORIDE, ANHYDROUS	S14887: 8SA2 (Sample)	0.001 tonne	UN Number	2331	Pack Group	III	CAS Number	7646-85-7		
			0.04 x 25 kg bags	Poison Sch.	6	Hazchem	2X		C, N, Xn		

Dangerous Goods Stock Manifest

Stock Summary

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Class	Sub. Risks	Pack Group	Quantity Packaged		Quantity Bulk	
			Weight (kg)	Volume (L)	Weight (kg)	Volume (L)
5.1		II	0.100	0.132		
5.1	6.1	III	3,470.000	5,019.014		
5.1	8	II	4,400.000	5,560.000		
8		II	496,433.868	434,370.286	103,907.000	74,224.989
8		III	449,137.663	400,880.460	78,140.380	54,194.100
8	3	II	18,387.000	28,674.500		
8	5.1	II	1,960.000	1,518.000		
8	Combustible Liquid (CL)	III	4,999.999	5,742.719		
9		III	875.000	266.000		
Combustible Liquid (CL)			1,020.000	957.700		

Dangerous Goods Stock Manifest

Stock by Building

Building Bulk Store / CAUSOB1000 to SULACB5000

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CAUSOB1000	Caustic Soda Liquid 50% Bulk SODIUM HYDROXIDE SOLUTION	3102846: F11-13 (AGT) 3253099D: F11-13 (AGT) 3253099E: F11-13 (AGT) 3253099F: F11-13 (AGT) 3253099G: F11-13 (AGT)	69.214 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			69214 x 1 kg bulk	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2R		C		
CAUSOD1872	Caustic Soda 50% (NSW) Bulk kg SODIUM HYDROXIDE SOLUTION	3253104B: F11-13 (AGT)	3.69 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			3690 x 1 kg bulk	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2R		C		
FECHSO2700	Ferric Chloride 42% Solution FERRIC CHLORIDE SOLUTION	3246260: F17 (AGT) 3246265: F17 (AGT) 3250137: F17 (AGT) 3820363: F17 (AGT) 3820783: F17 (AGT)	57.631 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			57631 x 1 kg bulk	UN Number	2582	Pack Group	III	CAS Number	7705-08-0		
				Poison Sch.	5	Hazchem	2X		C		
PHACID1104	Phosphoric Acid 75% Solution PHOSPHORIC ACID, SOLUTION	3804973: F03 (AGT)	6.23 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			6230 x 1 kg bulk	UN Number	1805	Pack Group	III	CAS Number	7664-38-2		
				Poison Sch.	6	Hazchem	2R		C		
SOHYCL1823	SODIUM HYPOCHLORITE 12.5% BULK HYPOCHLORITE SOLUTION	3816789: F14-15 (AGT)	1.041 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
			1041 x 1 L bulk	UN Number	1791	Pack Group	III	CAS Number			
				Poison Sch.	6	Hazchem	2X		C, N		
SULACB5000	Sulphuric Acid 98% Bulk SULPHURIC ACID with more than 51% acid	3814748: F16 (AGT)	1.623 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			1623 x 1 kg bulk	UN Number	1830	Pack Group	II	CAS Number	7664-93-9		
				Poison Sch.	6	Hazchem	2P		C		

Dangerous Goods Stock Manifest

Stock by Building

Building Default / CAUSOD1857 to NIACID5513

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification							
	Proper Shipping Name		Packs									
CAUSOD1857	Caustic Soda Liquid 50% 1530kg IBC (Returnable)	3803765: Default	1.53 tonne	Class 8	Sub. Risk(s) N/A	Physical State	Liquid	pH	Conc. Str.			
	SODIUM HYDROXIDE SOLUTION		1 x 1530 kg IBCs	UN Number 1824 Poison Sch. 6	Pack Group II Hazchem 2R	CAS Number	1310-73-2 C					Alkali
FLSIAC1701	Fluorosilicic Acid 27% Bulk	3805848: Default	0.03 tonne	Class 8	Sub. Risk(s) N/A	Physical State	Liquid	pH	Conc. Str.			
	FLUOROSILICIC ACID		30 x 1 kg bulk	UN Number 1778 Poison Sch. 7	Pack Group II Hazchem 2X	CAS Number	16961-83-4 C					Acid
HYACID1900	Hydrochloric Acid 33%, 240 kg Drums	3010383: Default (Reject)	0.24 tonne	Class 8	Sub. Risk(s) N/A	Physical State	Liquid	pH	Conc. Str.			
	HYDROCHLORIC ACID		1 x 240 kg drums	UN Number 1789 Poison Sch. 6	Pack Group II Hazchem 2R	CAS Number	7647-01-0 C					Acid
NIACID5513	Nitric Acid 68%	3820255: Default	1.4 tonne	Class 8	Sub. Risk(s) 5.1	Physical State	Liquid	pH	Acid			
	NITRIC ACID other than red fuming, with at least 65% but not more than 70% nitric acid		1 x 1400 kg IBCs	UN Number 2031 Poison Sch. 6	Pack Group II Hazchem 2R	CAS Number	7697-37-2 O, C					

Dangerous Goods Stock Manifest

Stock by Building

Building Front Warehouse / ACACID1892 to AMAQUI7501

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACACID1892	ACETIC ACID 90% 200kg Drums	3110036B: B	0.037 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
	ACETIC ACID SOLUTION, more than 80% acid, by mass		0.185 x 200 kg drums	UN Number	2789	Pack Group	II	CAS Number	64-19-7		
ACACID1916	Acetic Acid 75% 1000kg Returnable IBC	3814881: B	8 tonne	Poison Sch.	6	Hazchem	•2P		C, C		
	ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass		8 x 1000 kg IBCs	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
ACACID2200	Acetic Acid 25% - Gas 25	3001628: B	1 tonne	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
	ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass		1 x 1000 kg IBCs	Poison Sch.	5	Hazchem	2R		C		
ACACID5801	Acetic Acid 55% solution	3148429: B	2.08 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass		2 x 1040 kg IBCs	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
ACACID6400	Acetic Acid 45% 1000kg IBC	3807098: B 3810733: B	7 tonne	Poison Sch.	5	Hazchem	2R		C		
	ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass		7 x 1000 kg IBCs	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
ACACID7400	Acetic Acid 75% 1000kg IBC (One-way)	3195099: B	3 tonne	UN Number	2790	Pack Group	III	CAS Number	64-19-7		
	ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass		3 x 1000 kg IBCs	Poison Sch.	5	Hazchem	2R		C		
AMAEUE1836	AMMONIA 25%	3237417: E	7.98 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		42 x 190 kg drums	UN Number	2672	Pack Group	III	CAS Number	1336-21-6		
AMAEUE8201	Ammonia Aqueous Pl.Mauser (200Kpa)	3118776B: E	8.19 tonne	Poison Sch.	6	Hazchem	2R		C, N		
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		39 x 210 kg drums	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
AMAEUE7002	Ammonia Aqueous 23% IBC	3213949: E	24.57 tonne	UN Number	2672	Pack Group	III	CAS Number	1336-21-6		
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		27 x 910 kg IBCs	Poison Sch.	6	Hazchem	2R		C, N		
AMAEUE7501	Ammonia Aqueous 24% Full Metal	3091376B: E	0.91 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		1 x 910 kg IBCs	UN Number	2672	Pack Group	III	CAS Number	1336-21-6		
				Poison Sch.	6	Hazchem	2R		C, N		

Dangerous Goods Stock Manifest

Stock by Building

Building Front Warehouse / CAPOTA1805 to CAUSOD1852

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
CAPOTA1805	POTASSIUM HYDROXIDE 48% 200L Drum	3059964: E	0.6 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	POTASSIUM HYDROXIDE SOLUTION		3 x 200 L drums	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
CAPOTA1807	POTASSIUM HYDROXIDE 48% 300kg Drum	3166717: E	0.3 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	POTASSIUM HYDROXIDE SOLUTION		1 x 300 kg drums	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
CAPOTA1808	POTASSIUM HYDROXIDE 48% 1000kg IBC	3150157: E	1 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	POTASSIUM HYDROXIDE SOLUTION		1 x 1000 kg IBCs	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
CAPOTA1822	POTASSIUM HYDROXIDE 20% 200L Drums	3131122: E 3214908: E	2.8 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	POTASSIUM HYDROXIDE SOLUTION		14 x 200 L drums	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
CAPOTA1901	Caustic Potash Flake 1000kg	20160906: E	2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali
	POTASSIUM HYDROXIDE, SOLID		2 x 1000 kg bulkers	UN Number	1813	Pack Group	II	CAS Number	1310-58-3		
CASODA5300	Caustic Soda Micropearl 1000Kg	151558B: E (Reject)	1 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE, SOLID		1 x 1000 kg bulkers	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CASODA5301	Caustic Soda Micropearl 1000Kg	2754878: E (Reject)	0.725 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE, SOLID		0.725 x 1000 kg bulkers	UN Number	1823	Pack Group	II	CAS Number	1310-73-2		
CAUSOD1700	Caustic Soda Liquid 50% 1500kg IBC (One-Way)	3190689B: E	9 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE SOLUTION		6 x 1500 kg IBCs	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD1839	Caustic Soda Liquid 30% 20L Carboys	3197344: E	0.2 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE SOLUTION		10 x 20 L carboys	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD1841	Caustic Soda Liquid 30% 200L Drums	3233015: E	3.2 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE SOLUTION		16 x 200 L drums	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD1852	Caustic Soda Liquid 50% 20L Carboys	3812239: E	1.48 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE SOLUTION		74 x 20 L carboys	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		

Dangerous Goods Stock Manifest

Stock by Building

Building Front Warehouse / CAUSOD1854 to SOCHIT1824

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification						
	Proper Shipping Name		Packs								
CAUSOD1854	Caustic Soda Liquid 50% 200L Drums SODIUM HYDROXIDE SOLUTION	3218365: E	1.8 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			9 x 200 L drums	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD1914	Caustic Soda Liquid 50% 300kg Drums SODIUM HYDROXIDE SOLUTION	3091032: E 3198399: E	5.4 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			18 x 300 kg drums	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD8901	Caustic Soda Liquid 10% 220kg Mausers SODIUM HYDROXIDE SOLUTION	3209139: E 3814537: E	18.26 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			83 x 220 kg drums	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
FORMIC1832	Formic Acid 10% 1000kg Returnable IBCs FORMIC ACID with not less than 5% but less than 10% acid by mass	3814573: B	6 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
			6 x 1000 kg IBCs	UN Number	3412	Pack Group	III	CAS Number	64-18-6		
HYACIB9602	Hydrochloric Acid 35% IBC HYDROCHLORIC ACID	3156251: B	9.12 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			8 x 1140 kg IBCs	UN Number	1789	Pack Group	II	CAS Number	7647-01-0		
PHACID0900	Phosphoric Acid 85% FCC 1700kg One-Way IBC PHOSPHORIC ACID, SOLUTION	45CX1607045: B	28.9 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			17 x 1700 kg IBCs	UN Number	1805	Pack Group	III	CAS Number	7664-38-2		
PHACID8705	Phosphoric Acid 81% FCC 1650Kg PHOSPHORIC ACID, SOLUTION	45CX1607045: B	21.45 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			13 x 1650 kg IBCs	UN Number	1805	Pack Group	III	CAS Number	7664-38-2		
SOCHIT1811	SODIUM CHLORITE 7.5% 20L Carboys CHLORITE SOLUTION	3102092: E	120 L	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			6 x 20 L carboys	UN Number	1908	Pack Group	III	CAS Number	7758-19-2		
SOCHIT1815	SODIUM CHLORITE 31% 20L Carboys CHLORITE SOLUTION	3186158: E 3238609: E	680 L	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			34 x 20 L carboys	UN Number	1908	Pack Group	II	CAS Number	7758-19-2		
SOCHIT1824	SODIUM CHLORITE 25% CHLORITE SOLUTION	20160801: E	22.5 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			18 x 1250 kg IBCs	UN Number	1908	Pack Group	II	CAS Number	7758-19-2		

Dangerous Goods Stock Manifest

Stock by Building

Building Front Warehouse / SOCHIT1827 to
SULACI1817

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs		Hazard Classification							
SOCHIT1827	Sodium Chlorite 31% w/w solution 1250kg IBC CHLORITE SOLUTION	20160719: E 20160815: E	53.75 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str.	Alkali
			43 x 1250 kg IBCs	UN Number	1908	Pack Group	II	CAS Number	7758-19-2			
SOHYCL1812	SODIUM HYPOCHLORITE 12.5% one-way IBC HYPOCHLORITE SOLUTION	3198992: E	1 KLTR	Poison Sch.	5	Hazchem	2X		T, C, N			Alkali
			1 x 1000 L IBCs	UN Number	1791	Pack Group	III	CAS Number				
SOHYCL1832	SODIUM HYPOCHLORITE 12.5% 200L Drums Non Returnable HYPOCHLORITE SOLUTION	3240674: E 3258718: E	4.4 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali	
			22 x 200 L drums	UN Number	1791	Pack Group	III	CAS Number				
SOHYCL1832	SODIUM HYPOCHLORITE 12.5% 200L Drums Non Returnable HYPOCHLORITE SOLUTION	3069016: E (Reject)	0.2 KLTR	Poison Sch.	6	Hazchem	2X		C, N			
			1 x 200 L drums	UN Number	1791	Pack Group	III	CAS Number				
SOHYCL1838	SODIUM HYPOCHLORITE 12.5% 20L Non Returnable Carboys HYPOCHLORITE SOLUTION	3179096: E	0.64 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali	
			32 x 20 L carboys	UN Number	1791	Pack Group	III	CAS Number				
SOHYCL1861	SODIUM HYPOCHLORITE 12.5% 200L Drums Non Returnable HYPOCHLORITE SOLUTION	3812381: E	4.8 KLTR	Poison Sch.	6	Hazchem	2X		C, N			
			24 x 200 L drums	UN Number	1791	Pack Group	III	CAS Number				
SUACID1900	Sulphamic Acid Ind 500kg bulkers SULPHAMIC ACID	3166010: B	4 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid	
			8 x 500 kg bulkers	UN Number	2967	Pack Group	III	CAS Number	5329-14-6			
SUACID1900	Sulphamic Acid Ind 500kg bulkers SULPHAMIC ACID	3166010: B	32 tonne	Poison Sch.	6	Hazchem	2X		Xi			
			64 x 500 kg bulkers	UN Number	2967	Pack Group	III	CAS Number	5329-14-6			
SUACID2050	Sulphamic Acid SULPHAMIC ACID	3179583: B	0.5 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Solid	pH	Acid	
			20 x 25 kg bags	UN Number	2967	Pack Group	III	CAS Number	5329-14-6			
SUACID9000	Sulphamic Acid - 25kg SULPHAMIC ACID	2993627: B 3222872: E	1.45 tonne	Poison Sch.	6	Hazchem	2X		Xi			
			58 x 25 kg bags	UN Number	2967	Pack Group	III	CAS Number	5329-14-6			
SULACI1705	Sulphuric Acid 5% v/v returnable IBC SULPHURIC ACID with not more than 51% acid	3192469: B 3212431: B	3 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str.	Acid
			3 x 1000 L IBCs	UN Number	2796	Pack Group	II	CAS Number	7664-93-9			
SULACI1817	SULPHURIC ACID 34.5% 200L Drums SULPHURIC ACID with not more than 51% acid	3170870: B 3198025: B	1.8 KLTR	Poison Sch.	6	Hazchem	2R		C			Conc. Str. Acid
			9 x 200 L drums	UN Number	2796	Pack Group	II	CAS Number	7664-93-9			
				Poison Sch.	6	Hazchem	2R		C			

Dangerous Goods Stock Manifest

Stock by Building

Building Front Warehouse / SULACI1832 to ZISULP1809

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
SULACI1832	SULPHURIC ACID 98% 10L Carboy SULPHURIC ACID with more than 51% acid	3188758: B 3233945: B	0.12 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			12 x 10 L carboys	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1851	Sulphuric Acid 50% 1000L Returnable IBC SULPHURIC ACID with not more than 51% acid	3238028: B 3815963: B	4 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			4 x 1000 L IBCs	UN Number Poison Sch.	2796 6	Pack Group Hazchem	II 2R	CAS Number	7664-93-9 C		
SULACI1854	SULPHURIC ACID 60% 200L DRUMS SULPHURIC ACID with more than 51% acid	3247746: B	0.4 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 200 L drums	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1855	SULPHURIC ACID 60% 1000L One-Way IBC SULPHURIC ACID with more than 51% acid	3193003: B 3194721: B	4 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			4 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1917	SULPHURIC ACID 70% 200L Drums SULPHURIC ACID with more than 51% acid	3171792: B	1.2 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			6 x 200 L drums	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1959	SULPHURIC ACID 60% 1000L Returnable IBC SULPHURIC ACID with more than 51% acid	3101219: B	2 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1993	SULPHURIC ACID 70% 1000L 1-way IBC SULPHURIC ACID with more than 51% acid	3248310: B 3253465: B	8.405 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			8.405 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI4203	Sulphuric Acid 60% 1500kg IBC (Cust. INTEG SA 60) SULPHURIC ACID with more than 51% acid	3241345: B	4.5 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			3 x 1500 kg IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
TRETAM1836	TRIETHANOLAMINE 50% 1020kg Returnable IBC Triethanolamine 50%	3244460: E	1.02 tonne	Class	CL	Sub. Risk(s)		Physical State	Liquid	pH	N/A
			1 x 1020 kg IBCs	UN Number Poison Sch.	N/A 5	Pack Group Hazchem	N/A N/A	CAS Number	Mixture Xn		
URPHOS4000	Urea Phosphate 40% w/w Solution CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.(Contains 25% Phosphoric Acid)	3248748: B	10.71 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			9 x 1190 kg IBCs	UN Number Poison Sch.	3264 5	Pack Group Hazchem	III 2X	CAS Number	4861-19-2 C		
ZISULP1809	ZINC SULPHATE MONO PWD ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc Sulphate)	712414 : E	0.875 tonne	Class	9	Sub. Risk(s)	N/A	Physical State	Solid	pH	N/A
			35 x 25 kg bags	UN Number Poison Sch.	3077 6	Pack Group Hazchem	III 2Z	CAS Number	7446-19-7 Xn, N		

Dangerous Goods Stock Manifest

Stock by Building

Building Mid Warehouse / ACACID1863 to CAUSOD1856

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACACID1863	ACETIC ACID GLACIAL 200kg Drums	2929656D: F	10.88 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
	ACETIC ACID, GLACIAL	3011772B: F 3166120B: T	54.4 x 200 kg drums	UN Number	2789	Pack Group	II	CAS Number	64-19-7		
AMAEUE5521	Ammonia Aqueous	3202946B: D	8.46 tonne	Poison Sch.	6	Hazchem	•2P		C		
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		423 x 20 kg pails	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
AMAQUI7501	Ammonia Aqueous 24% Full Metal	3202946A: D	9.1 tonne	UN Number	2672	Pack Group	III	CAS Number	1336-21-6		
	AMMONIA SOLUTION relative density between 0.880 and 0.957 at 15°C in water, with more than 10% but not more than 35% ammonia		10 x 910 kg IBCs	Poison Sch.	6	Hazchem	2R		C, N		
CAPOTA1808	POTASSIUM HYDROXIDE 48% 1000kg IBC	3150157: D	8 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
	POTASSIUM HYDROXIDE SOLUTION	3206017: D	8 x 1000 kg IBCs	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
CAPOTA1809	POTASSIUM HYDROXIDE 48% 1000L IBC	3248336: D	12 KLTR	Poison Sch.	6	Hazchem	2R		C		
	POTASSIUM HYDROXIDE SOLUTION	3815627: D	12 x 1000 L IBCs	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Alkali
CAUSOD1823	Caustic Soda Liquid 46% 1000L IBC (Returnable)	3159825: D	12 KLTR	UN Number	1814	Pack Group	II	CAS Number	1310-58-3		
	SODIUM HYDROXIDE SOLUTION	3248772: D	12 x 1000 L IBCs	Poison Sch.	6	Hazchem	2R		C		
CAUSOD1831	Caustic Soda Liquid 25% Bulk (kg)	3811255: F	17.86 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE SOLUTION		17860 x 1 kg bulk	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD1831	Caustic Soda Liquid 25% Bulk (kg)	2121849: D (Reject)	1 tonne	Poison Sch.	6	Hazchem	2R		C		
	SODIUM HYDROXIDE SOLUTION		1000 x 1 kg bulk	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
CAUSOD1842	Caustic Soda Liquid 30% 1000L IBC (Returnable)	3227022: D	1 KLTR	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
	SODIUM HYDROXIDE SOLUTION		1 x 1000 L IBCs	Poison Sch.	6	Hazchem	2R		C		
CAUSOD1843	Caustic Soda Liquid 30% 1000L IBC (One-Way)	3211417: D	1 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
	SODIUM HYDROXIDE SOLUTION		1 x 1000 L IBCs	UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
CAUSOD1856	Caustic Soda Liquid 50% 1000L IBC (Returnable)	3817216: D	14 KLTR	Poison Sch.	6	Hazchem	2R		C		
	SODIUM HYDROXIDE SOLUTION		14 x 1000 L IBCs	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
				UN Number	1824	Pack Group	II	CAS Number	1310-73-2		
				Poison Sch.	6	Hazchem	2R		C		

Dangerous Goods Stock Manifest

Stock by Building

Building Mid Warehouse / CAUSOD1856 to GASOLN2010

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CAUSOD1856	Caustic Soda Liquid 50% 1000L IBC (Returnable) SODIUM HYDROXIDE SOLUTION	2929495: D (Reject)	0.3 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.3 x 1000 L IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOD1857	Caustic Soda Liquid 50% 1530kg IBC (Returnable) SODIUM HYDROXIDE SOLUTION	2730351: D (Reject)	1.072 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			0.700653 x 1530 kg IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOD1857	Caustic Soda Liquid 50% 1530kg IBC (Returnable) SODIUM HYDROXIDE SOLUTION	3247229: D 3809701: D	18.36 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			12 x 1530 kg IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOD1894	Caustic Soda Liquid 25% 1000L IBC (Returnable) SODIUM HYDROXIDE SOLUTION	3182190: D	3 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			3 x 1000 L IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOD1912	Caustic Soda Liquid 50% 1530kg IBC (One-Way) SODIUM HYDROXIDE SOLUTION	3814749: D	9.18 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			6 x 1530 kg IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOD1915	Caustic Soda Liquid 30% 800L IBC (Returnable - Nylex) SODIUM HYDROXIDE SOLUTION	3247239: D	0.8 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			1 x 800 L IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
CAUSOI2001	Caustic Soda Liquid 20% 1220kg IBC (One-Way) SODIUM HYDROXIDE SOLUTION	3115527: D	2.44 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Alkali
			2 x 1220 kg IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C		
FECHSO2505	Ferric Chloride 42% Solution FERRIC CHLORIDE SOLUTION	3225325: C	12.6 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			9 x 1400 kg IBCs	UN Number Poison Sch.	2582 5	Pack Group Hazchem	III 2X	CAS Number	7705-08-0 C		
FLSIAC1700	Fluorosilicic Acid 27% One-way IBCs FLUOROSILICIC ACID	3199396B: C	3.75 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			3 x 1250 kg IBCs	UN Number Poison Sch.	1778 7	Pack Group Hazchem	II 2X	CAS Number	16961-83-4 C		
FORMIC3700	Formic Acid 85% 1200kg IBC FORMIC ACID with more than 85% acid by mass	3148507B: T	1.47 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
			1.225 x 1200 kg IBCs	UN Number Poison Sch.	1779 5	Pack Group Hazchem	II ●2W	CAS Number	64-18-6 C		
GASOLN2010	Gassing Solution OXIDIZING LIQUID, TOXIC, N.O.S. (SODIUM THIOCYANATE AND SODIUM NITRITE)	3170883: T	0.39 tonne	Class	5.1	Sub. Risk(s)	6.1	Physical State	Liquid	pH	Neutral
			0.356164 x 1095 kg IBCs	UN Number Poison Sch.	3099 6	Pack Group Hazchem	III 2W	CAS Number	T, N, O		

Dangerous Goods Stock Manifest

Stock by Building

Building Mid Warehouse / HYPERT6200 to TOLYL1200

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
HYPERT6200	Hydrogen Peroxide 50% - 1100kg	16073331: T	4.4 tonne	Class	5.1	Sub. Risk(s)	8	Physical State	Liquid	pH	Conc. Str. Acid
	HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20% but not more than 60% hydrogen peroxide (stabilized as necessary)	16082350: T	4 x 1100 kg IBCs	UN Number	2014	Pack Group	II	CAS Number	7722-84-1		
SOHYCL1812	SODIUM HYPOCHLORITE 12.5% one-way IBC	3239772: D	6 KLTR	Poison Sch.	6	Hazchem	2P		O, C		
	HYPOCHLORITE SOLUTION	3252005: D	6 x 1000 L IBCs	UN Number	1791	Pack Group	III	Physical State	Liquid	pH	Alkali
SOHYCL1812	SODIUM HYPOCHLORITE 12.5% one-way IBC	2964331: D (Reject)	2 KLTR	Poison Sch.	6	Hazchem	2X	CAS Number			
	HYPOCHLORITE SOLUTION		2 x 1000 L IBCs	UN Number	1791	Pack Group	III	Physical State	Liquid	pH	Alkali
SOHYCL1813	Sodium Hypochlorite 12.5% 1000L Returnable IBC	2599840: D (Reject)	3 KLTR	Poison Sch.	6	Hazchem	2X	CAS Number			
	HYPOCHLORITE SOLUTION	3050784: D (Reject)	3 x 1000 L IBCs	UN Number	1791	Pack Group	III	Physical State	Liquid	pH	Alkali
SOHYCL1813	Sodium Hypochlorite 12.5% 1000L Returnable IBC	3812289: D	26 KLTR	Poison Sch.	6	Hazchem	2X	CAS Number			
	HYPOCHLORITE SOLUTION	3814151: D	26 x 1000 L IBCs	UN Number	1791	Pack Group	III	Physical State	Liquid	pH	Alkali
SOHYCL1832	SODIUM HYPOCHLORITE 12.5% 200L Drums	2355783: D (Reject)	2.6 KLTR	Poison Sch.	6	Hazchem	2X	CAS Number			
	Non Returnable	3104924: D (Reject)	13 x 200 L drums	UN Number	1791	Pack Group	III	Physical State	Liquid	pH	Alkali
SONITL1803	SODIUM NITRITE 40% w/w	936932: T (Reject)	600 L	Poison Sch.	6	Hazchem	2W	CAS Number			
	OXIDIZING LIQUID, TOXIC, N.O.S. (Sodium Nitrite 40% Solution)		3 x 200 L drums	UN Number	3099	Pack Group	III	Physical State	Liquid	pH	Alkali
SONITR9100	Sodium Nitrite - No Anticaking	3097601: T	2.3 tonne	Poison Sch.	7	Hazchem	1Z	CAS Number			
	SODIUM NITRITE		92 x 25 kg bags	UN Number	1500	Pack Group	III	Physical State	Solid	pH	Alkali
TOLYL1200	Tolyltriazole 50% Sodium Salt	2687800: D (Reject)	2.399999 tonne	Poison Sch.	N/A	Hazchem	2X	CAS Number			
	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (Tolyltriazole, Sodium Salt)		1.999999 x 1200 kg IBCs	UN Number	3267	Pack Group	III	Physical State	Liquid	pH	Alkali
				Poison Sch.		Hazchem		CAS Number	64665-57-2		
									C, Xn		

Dangerous Goods Stock Manifest

Stock by Building

Building Rear Warehouse / ACACID1830 to
GLUTER4501

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

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Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
ACACID1830	ACETIC ACID 45% 25kg Carboys	3139742: G	0.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass		8 x 25 kg carboys	UN Number	2790	Pack Group	III	CAS Number	64-19-7		
ACACID1831	ACETIC ACID 20% 200kg Drums	2955808: G	1.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	ACETIC ACID SOLUTION, more than 10% and less than 50% acid, by mass		6 x 200 kg drums	UN Number	2790	Pack Group	III	CAS Number	64-19-7		
ACACID1863	ACETIC ACID GLACIAL 200kg Drums	3166120A: G 3166120B: G	6 tonne	Class	8	Sub. Risk(s)	3	Physical State	Liquid	pH	Acid
	ACETIC ACID, GLACIAL		30 x 200 kg drums	UN Number	2789	Pack Group	II	CAS Number	64-19-7		
ACACID7500	Acetic Acid 75% - Blue Drums	3031110: G 3218784B: G	17.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	ACETIC ACID SOLUTION, not less than 50% but not more than 80% acid, by mass		86 x 200 kg drums	UN Number	2790	Pack Group	II	CAS Number	64-19-7		
FECHLO1812	FERRIC CHLORIDE 42% 290KG Drums	945071: G	0.87 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	FERRIC CHLORIDE SOLUTION		3 x 290 kg drums	UN Number	2582	Pack Group	III	CAS Number	7705-08-0		
FECHSO2505	Ferric Chloride 42% Solution	3222690: G 3225287: G 3233825: G	123.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	FERRIC CHLORIDE SOLUTION		88 x 1400 kg IBCs	UN Number	2582	Pack Group	III	CAS Number	7705-08-0		
FECHSO2700	Ferric Chloride 42% Solution	2738242: G (Reject) 3117535: G (Reject)	13.051 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
	FERRIC CHLORIDE SOLUTION		13051 x 1 kg bulk	UN Number	2582	Pack Group	III	CAS Number	7705-08-0		
FORMAL1100	Formaldehyde 37/7 IBC	2576412: G (Reject)	2.2 tonne	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
	FORMALDEHYDE SOLUTION with not less than 25% formaldehyde		2 x 1100 kg IBCs	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
FORMAL1817	Formalin 37/7 1000kg IBC	2195809: G (Reject)	0.4 tonne	Class	8	Sub. Risk(s)	CL	Physical State	Liquid	pH	Acid
	FORMALDEHYDE SOLUTION with not less than 25% formaldehyde		0.4 x 1000 kg IBCs	UN Number	2209	Pack Group	III	CAS Number	50-00-0		
GLUTER4500	Glutaraldehyde 50%	3132437A: G	2.2 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (GLUTARALDEHYDE 50%)		2 x 1100 kg IBCs	UN Number	3265	Pack Group	II	CAS Number	111-30-8		
GLUTER4501	Glutaraldehyde 50%	3132437B: G	2.64 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Acid
	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (GLUTARALDEHYDE 50%)		12 x 220 kg drums	UN Number	3265	Pack Group	II	CAS Number	111-30-8		

Dangerous Goods Stock Manifest

Stock by Building

Building Rear Warehouse / HYACIB1900 to PHACID0900

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
HYACIB1900	Hydrochloric Acid 33% 1170Kg IBC (One-Way) HYDROCHLORIC ACID	2977952: G 3164021: G 3211943: G	62.01 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			53 x 1170 kg IBCs	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C		
HYACIB1900	Hydrochloric Acid 33% 1170Kg IBC (One-Way) HYDROCHLORIC ACID	3211943: G (Reject)	16.38 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			14 x 1170 kg IBCs	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C		
HYACIB2500	Hydrochloric Acid 33% HYDROCHLORIC ACID	3066165: G (Reject)	3.48 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			3 x 1160 kg IBCs	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C		
HYACIB9602	Hydrochloric Acid 35% IBC HYDROCHLORIC ACID	3200990: G	45.6 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			40 x 1140 kg IBCs	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C		
HYACID1847	HYDROCHLORIC ACID 9% 20L Carboys HYDROCHLORIC ACID	3024610: G	0.04 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 20 L carboys	UN Number Poison Sch.	1789 5	Pack Group Hazchem	III 2R	CAS Number	7647-01-0 C		
HYACID1900	Hydrochloric Acid 33%, 240 kg Drums HYDROCHLORIC ACID	3010383: G (Reject)	0.24 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			1 x 240 kg drums	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C		
NIACID6500	Nitric Acid 68% 280kg NITRIC ACID other than red fuming, with at least 65% but not more than 70% nitric acid	3009673: G (Reject)	0.28 tonne	Class	8	Sub. Risk(s)	5.1	Physical State	Liquid	pH	Acid
			1 x 280 kg drums	UN Number Poison Sch.	2031 6	Pack Group Hazchem	II 2R	CAS Number	7697-37-2 O, C		
PHACID0100	Phosphoric Acid 85% Food 35kg Carboys PHOSPHORIC ACID, SOLUTION	45CX1510050: G 45CX1605029: G	8.54 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			244 x 35 kg carboys	UN Number Poison Sch.	1805 6	Pack Group Hazchem	III 2R	CAS Number	7664-38-2 C		
PHACID0900	Phosphoric Acid 85% FCC 1700kg One-Way IBC PHOSPHORIC ACID, SOLUTION	45CX1606040: G	3.4 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 1700 kg IBCs	UN Number Poison Sch.	1805 6	Pack Group Hazchem	III 2R	CAS Number	7664-38-2 C		
PHACID0900	Phosphoric Acid 85% FCC 1700kg One-Way IBC PHOSPHORIC ACID, SOLUTION	45CX1606040: G	1.7 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			1 x 1700 kg IBCs	UN Number Poison Sch.	1805 6	Pack Group Hazchem	III 2R	CAS Number	7664-38-2 C		

Dangerous Goods Stock Manifest

Stock by Building

Building Rear Warehouse / PHACID8602 to
SULACI1842

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
PHACID8602	Phosphoric Acid 75% Food 1550kg PHOSPHORIC ACID, SOLUTION	45CX1604028: G	55.8 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			36 x 1550 kg IBCs	UN Number Poison Sch.	1805 6	Pack Group Hazchem	III 2R	CAS Number	7664-38-2 C		
PHACID8705	Phosphoric Acid 81% FCC 1650Kg PHOSPHORIC ACID, SOLUTION	45CX1605032: G	3.3 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			2 x 1650 kg IBCs	UN Number Poison Sch.	1805 6	Pack Group Hazchem	III 2R	CAS Number	7664-38-2 C		
SULACB5000	Sulphuric Acid 98% Bulk SULPHURIC ACID with more than 51% acid	L151094: G (Reject)	0.49 tonne	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			490 x 1 kg bulk	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1743	SULPHURIC ACID 98% 1000L Nylex Returnable IBC SULPHURIC ACID with more than 51% acid	3817242: G	3 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			3 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1835	SULPHURIC ACID 98% 200L Drums SULPHURIC ACID with more than 51% acid	3236720: G	2.8 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			14 x 200 L drums	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1842	SULPHURIC ACID 98% 1000L One-way IBCs SULPHURIC ACID with more than 51% acid	3817305: G	5 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			5 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		
SULACI1842	SULPHURIC ACID 98% 1000L One-way IBCs SULPHURIC ACID with more than 51% acid	2899618: G (Reject)	0.186 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str. Acid
			0.186 x 1000 L IBCs	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C		

Dangerous Goods Stock Manifest

Stock by Building

Building Sample / CAUSOD1843 to SULACI1917

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description	Batch(es) / Area(s)	Quantity		Hazard Classification							
	Proper Shipping Name		Packs									
CAUSOD1843	Caustic Soda Liquid 30% 1000L IBC (One-Way) SODIUM HYDROXIDE SOLUTION	2493817: Sample (Sample) 2810564: Sample (Sample)	0.00025 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str.	Alkali
			0.00025 x 1000 L IBCs	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C			
CAUSOD1852	Caustic Soda Liquid 50% 20L Carboys SODIUM HYDROXIDE SOLUTION	2271338: Sample (Sample)	0.000145 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str.	Alkali
			0.00725 x 20 L carboys	UN Number Poison Sch.	1824 6	Pack Group Hazchem	II 2R	CAS Number	1310-73-2 C			
HYACID1834	HYDROCHLORIC ACID 33%, 20 litre carboys (One-Way) HYDROCHLORIC ACID	2382132: Sample (Sample)	0.000205 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str.	Acid
			0.01025 x 20 L carboys	UN Number Poison Sch.	1789 6	Pack Group Hazchem	II 2R	CAS Number	7647-01-0 C			
SOCHIT1811	SODIUM CHLORITE 7.5% 20L Carboys CHLORITE SOLUTION	2509197: Sample (Sample)	0.060318 L	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str.	Alkali
			0.003015 x 20 L carboys	UN Number Poison Sch.	1908 5	Pack Group Hazchem	III 2X	CAS Number	7758-19-2 C			
SOPERC4400	Sodium Percarbonate Coated SODIUM CARBONATE PEROXYHYDRATE	154822: Sample (Sample)	0.0001 tonne	Class	5.1	Sub. Risk(s)	N/A	Physical State	Solid	pH	Alkali	
			0.004 x 25 kg bags	UN Number Poison Sch.	3378 6	Pack Group Hazchem	II 1Y	CAS Number	15630-89-4 O, Xn, Xi			
SULACI1832	SULPHURIC ACID 98% 10L Carboy SULPHURIC ACID with more than 51% acid	2837015: Sample (Sample)	0.000019 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str.	Acid
			0.0019 x 10 L carboys	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C			
SULACI1917	SULPHURIC ACID 70% 200L Drums SULPHURIC ACID with more than 51% acid	2732415: Sample (Sample)	0.000591 KLTR	Class	8	Sub. Risk(s)	N/A	Physical State	Liquid	pH	Conc. Str.	Acid
			0.002955 x 200 L drums	UN Number Poison Sch.	1830 6	Pack Group Hazchem	II 2P	CAS Number	7664-93-9 C			

Dangerous Goods Stock Manifest

Stock by Building

Building Waste Treatment / CAUSOD1857 to
NIACID9300

Location

Redox Pty Ltd
144 Gilba Road
Girraween NSW 2145
Australia

Date

2/11/2016

Emergency Contact 1

Greg Luke (+61-409103822)

Emergency Contact 2

Malcolm Perrins (+61-417675225)

Code	Description Proper Shipping Name	Batch(es) / Area(s)	Quantity Packs	Hazard Classification							
CAUSOD1857	Caustic Soda Liquid 50% 1530kg IBC (Returnable) SODIUM HYDROXIDE SOLUTION	2240985: W (IBCs) (Manufacturing)	1.53 tonne 1 x 1530 kg IBCs	Class UN Number Poison Sch.	8 1824 6	Sub. Risk(s) Pack Group Hazchem	N/A II 2R	Physical State CAS Number	Liquid 1310-73-2 C	pH	Conc. Str. Alkali
EFFLUE3000	Effluent Waste Water Weak Alkali (IBC) CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	N/A: W (IBCs) (Manufacturing)	3 KLTR 3 x 1000 L IBCs	Class UN Number Poison Sch.	8 3266 N/A	Sub. Risk(s) Pack Group Hazchem	N/A III 2X	Physical State CAS Number	Liquid	pH	Alkali
EFFLUE4000	Effluent Waste Water Concentrated Alkali (IBC) CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	N/A: W (IBCs) (Manufacturing)	9 KLTR 9 x 1000 L IBCs	Class UN Number Poison Sch.	8 3266 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid	pH	Conc. Str. Alkali
EFFLUE4500	Effluent Waste Water Concentrated Alkali (Bulk/AGT) CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.	N/A: W (AGT) (Manufacturing)	10 KLTR 10000 x 1 L bulk	Class UN Number Poison Sch.	8 3266 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid	pH	Conc. Str. Alkali
EFFLUE6000	Effluent Waste Water Concentrated Acid (IBC) CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.	N/A: W (IBCs) (Manufacturing)	15 KLTR 15 x 1000 L IBCs	Class UN Number Poison Sch.	8 3264 Not schedule d	Sub. Risk(s) Pack Group Hazchem	N/A II 2X	Physical State CAS Number	Liquid	pH	Conc. Str. Acid
NIACID9300	Nitric Acid 68% Min NITRIC ACID other than red fuming, with at least 65% but not more than 70% nitric acid	146588B: W (IBCs) (Manufacturing)	0.28 tonne 1 x 280 kg drums	Class UN Number Poison Sch.	8 2031 6	Sub. Risk(s) Pack Group Hazchem	5.1 II 2R	Physical State CAS Number	Liquid 7697-37-2 O, C	pH	Acid

Proposed Amended Stage IV Development Redox, 2 Swettenham Road Minto COMMUNITY INFORMATION SHEET

Dear Resident and Neighbour,

Redox operate their chemical warehousing and logistics business at No 2 Swettenham Road, Minto and have been there since 2005. The site was developed over four stages. Stage IV has not been built but the business is now in need of this final stage of the development approved back in 2003.

Stage IV involves storing liquid chemicals in bulk and dispensing these into packages and containers.

Figure 1 shows the location of the Redox site and circled is the approved location of Stage IV.

Some changes now need to be made and these are detailed in an Environmental Assessment report that requires approval from the Department of Planning and Environment.

This leaflet provides a summary of the changes that are required.

These changes are:

- Production activities to be situated within a new building and awning area.
- The quantity of bulk liquid chemicals to be stored would increase from 250 tonne to 540 tonne.
- Additional chemicals to be handled including those used for food processing and water treatment.

Figure 2 (overleaf) is a schematic diagram of the Stage IV development. This is a far better design than what was originally approved in 2003.

Project Benefits

The project would increase employment in the area for production operators, store-people, chemists and supervisors working at the plant. Housing operations within new production buildings would allow staff to undertake their work under cover and reduce noise and dust emissions from these processes. The state-of-the-art plant will blend and repackage high quality raw material products for customers in many industries already serviced by Redox including food processing, water treatment, agriculture and many others.

The development involves bulk tanks filled by road tankers in a roofed and bunded area.

The chemicals are then transferred into mixing tanks where the chemicals can be blended with water before being decanted into 15 L, 20 L, 25 L, 205 L and 1,000 L containers for end users, many in the food industry.

Time has been set aside on Friday 23 February and the following Tuesday 27 February between 3 pm–6 pm at Redox Offices for residents and neighbours who may wish to view more information on the changes to the already approved Stage IV of the site. This would complete the development of the site which has operated without experiencing any pollution incident.



Figure 1: Redox location indicated by white border. Orange circle indicates the location of Stage IV.
(Source: Google Earth Pro)

Proposed Amended Stage IV Development Redox, 2 Swettenham Road Minto COMMUNITY INFORMATION SHEET

The area shown would be roofed and banded.

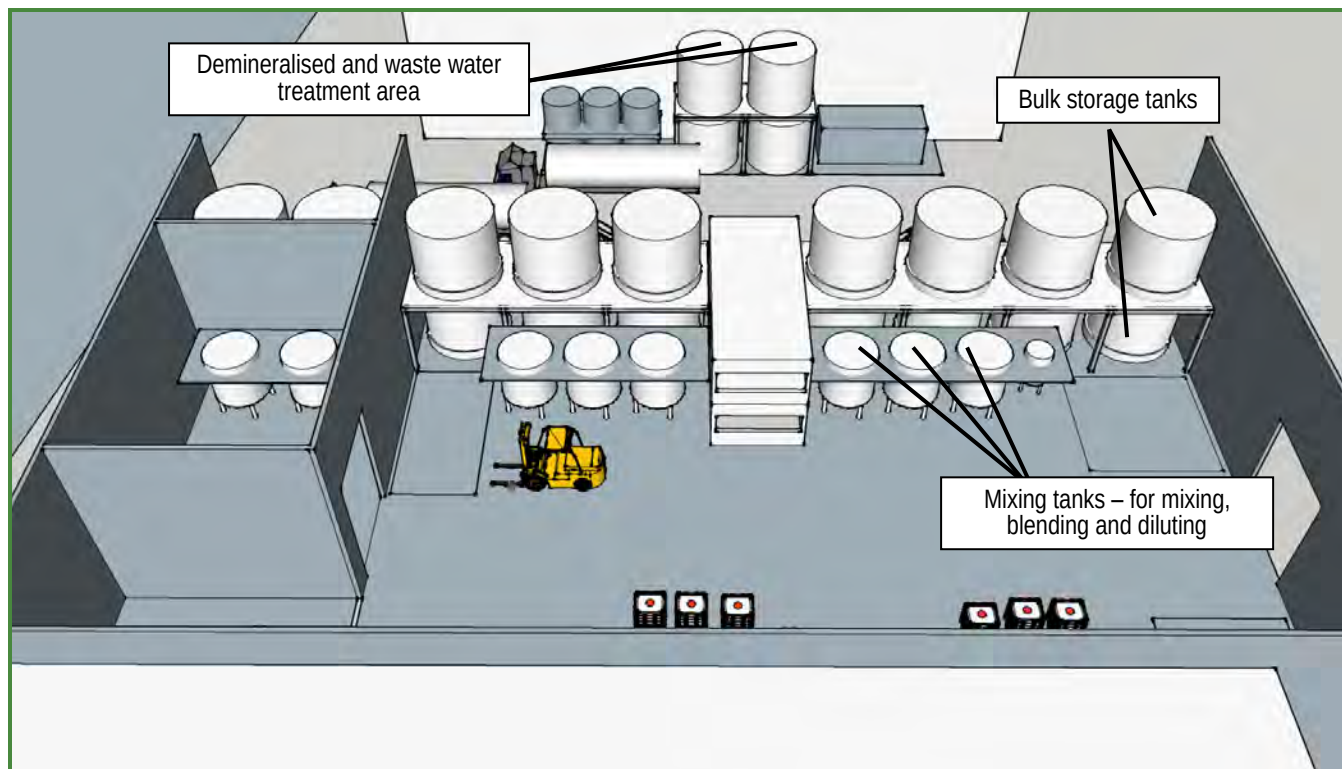


Figure 2: Schematic diagram of the Stage IV development

NSW EPA have given this site a low risk rating – Level 1. Directors of Redox welcome your attendance at one of the two consultation dates that are available. If you would like further information but are unable to attend one of these organised visits, please contact our Principal Consultant, Dick Benbow, on 0418 689 074 who will organise to discuss the changes further.

For more information

For further information contact Dick Benbow on 0418 689 074, Benbow Environmental on (02) 9890 5099 or email admin@benbowenviro.com.au



Benbow
ENVIRONMENTAL

A.B.N. 17 160 013 641

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Visit our Website at www.benbowenviro.com.au

Existing Operations

A series of photographs present current views of the site and the surrounds. A set of photographs commence at the front entrance into the site at No. 2 Swettenham Road, Minto and continue along the site beginning at the southern end. The open land for the Stage IV development is presented in Photograph 1.12.

Photograph 1.1: This is a view to the north east from the balcony of the Head Office building and shows the B1/B2 warehouses in the centre of the photograph (arrowed). As evident from this view, the warehouses are at a lower level.

Also evident, is the extent of industrial and commercial development within the vicinity of the site.

Adjacent to the B1/B2 warehouses and to the right of these warehouses, the landscaping of the site along the eastern boundary can be sighted (arrowed).



Photograph 1.2: This is a further view from the balcony of the head office building to the north and along Swettenham Road.

The nearest premises to this area of the site is a United petrol station with car wash visible in the right hand half of the photograph.

Also clearly in view is the security fencing of the site. This consists of a manproof fence with electrical wiring which is pulsed to cause discomfort and therefore prevent unlawful entry.



Photograph 1.3: This last view from the balcony shows the first of the warehouses that are a part of Building C.

The site buildings commence with the Head Office building being 'A' then the first of the warehouses – commencing from the southern end – is Building B1/B2 and then the next Building is C followed by D, E, and G, the future Stage IV is F then other existing buildings are H, I and J.

Photographs of typical buildings are provided.



Photograph 1.4: This is a view towards the south across the front of B1 and B2 warehouses. Each of the warehouses has been bunded by lowering the level of the floor to provide the required bund volume.

This practice is extended across all warehouses and the method used is shown in the following photograph.



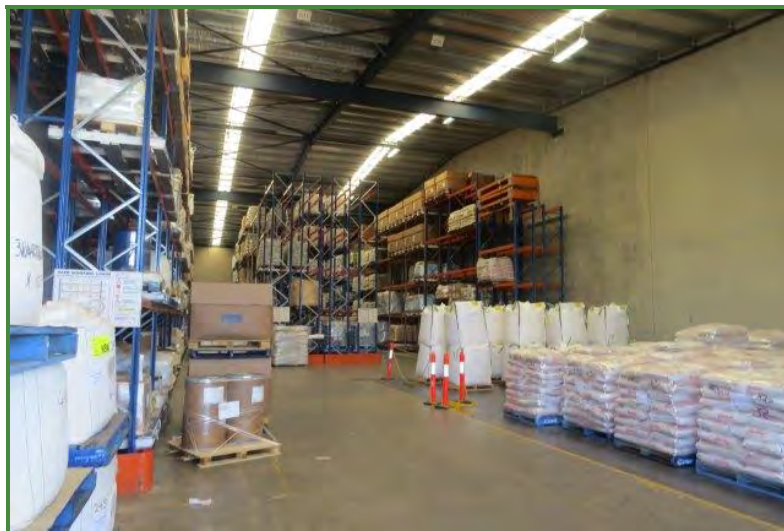
Photograph 1.5: The floor level is lowered relative to the doorways thus creating a “well”. The floor from the doorway into the lower level of the building has a gentle slope.



Photograph 1.6: This is a view across the front of the C warehouse and is typical of all the warehouses.



Photograph 1.7: This is a view of one of the warehouses showing the storage practices.



Photograph 1.8: Each of the dangerous goods storage warehouses has the appropriate placarding at the entrance.



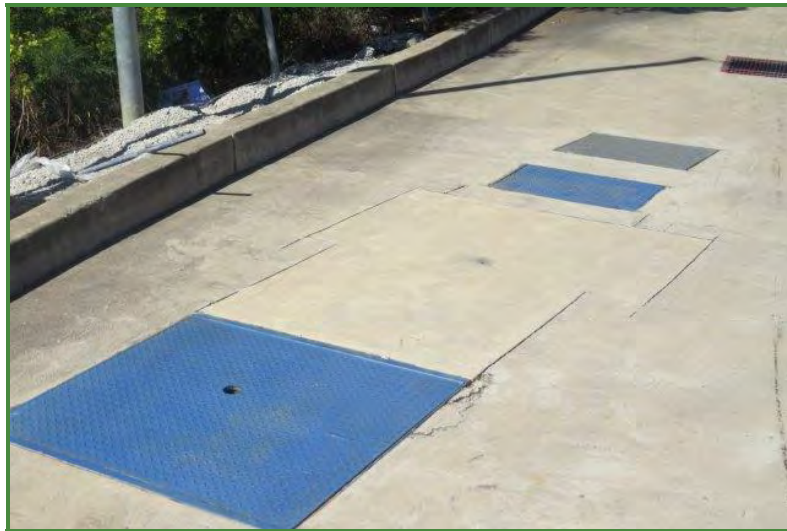
Photograph 1.9: The awning area provides all weather protection for unloading, providing a staging area for products to be loaded, and then the loading on to trucks. A small number of shipping containers are loaded for export, mainly to New Zealand.



Photograph 1.10: To the east of the site, as shown in this photograph, is Bow Bowing stormwater channel. The channel can be seen in the photograph (arrowed). Also of note, in the foreground of this view is the extensive landscaping along the eastern bank of the Redox site.



Photograph 1.11: As a result of the original environmental, hazard and fire studies, a system of stormwater isolation was designed in conjunction with offices of the then NSW Fire Brigade. The system is not described as it exists and is more than adequate for the existing and proposed modifications to Stage IV of the original development.



Photograph 1.12: This is the area reserved for the Stage IV development. This view is to the north-west and serves to also show the high embankment which is a feature of the western perimeter of the site.



Redox Minto - Stage IV proposal - Message (HTML)

FILE MESSAGE ESET

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Wed 22-Aug-18 3:41 PM

 SCHIBECI, MARK <Mark.Schibeci@sydneywater.com.au>
Redox Minto - Stage IV proposal

To: Benbow Office Admin

 Follow up. Start by Wednesday, August 22, 2018. Due by Wednesday, August 22, 2018.
You forwarded this message on 22-Aug-18 3:48 PM.

Message  Trade wastewater application form - industrial.doc

Hello Benbow Environmental,

I have been handed your letter to Sydney Water, dated 7 August, regarding the Stage IV development at Redox Minto.

As you would know, there is currently a trade waste consent in place for a wash bay on site and this is about to be renewed for another four years.

Your letter provides an overview of what is proposed but, as more information is required, I have attached an Application for a Trade Wastewater Consent and I would ask that this be completed in the first instance.

It is likely that the discharge from the proposed development will need to be under a separate consent, depending on its location on the site, particularly as the proposed process differs from that currently operating.

This will confirmed at a later date.

Please do not hesitate to contact me should you have any questions about the application or any related matters.

Regards,

Mark Schibeci
Business Customer Representative
Major Customers / Sydney Water
Lathe Road
Unanderra NSW 2526
M: 0418 279 837
E: mark.schibeci@sydneywater.com.au

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Tue 28-Aug-18 3:33 PM

Andrew Battye <Andrew.Battye@safework.nsw.gov.au>

Redox at Minto

To Benbow Office Admin

Cc Contact@safework.nsw.gov.au

Security Classification:UNCLASSIFIED

Hi Dick,

I am in receipt of your letter dated 27 August 2018 informing SafeWork NSW of Stage IV of Redox – 2 Swettenham Road, Minto site
Section 75W Application to Department of Planning and Environment.

SafeWork NSW may make comments to the Department of Planning and Environment if requested.

However, on completion of the works Redox will be required to update its notification of hazardous chemicals to SafeWork NSW under clause 348 (2) (a) of the Work Health and Safety Regulation 2017 (Regulation), as well as update the manifest on site and the emergency plan. Redox must manage in accordance with Part 3.1 , of the Regulation risks to health and safety associated with using , handling, generating or storing of the additional hazardous chemicals that will be held on site in accordance with clause 351 of the Regulation.

If you have any questions in regards this matter please contact me.

Regards

Andrew

Andrew Battye
Manager | Dangerous Goods & Explosives
SafeWork NSW
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MANUFACTURER AND WHOLESALE INSPECTION PROGRAM INFORMATION PACK



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Contents

INFORMATION PACK FOR MWIP BUSINESSES	4
Obligations for food businesses	4
Issues to consider for food businesses	4
More information	4
MANUFACTURER / WHOLESALE FOOD INSPECTION PROGRAM	5
Legal responsibilities of a food business proprietor	5
Definition of a food business	5
Inspections	5
Costs	6
How the charge is calculated	6
More information	6
CLEANING AND SANITISING IN FOOD BUSINESSES	7
How to sanitise effectively	7
More information	8
DECLARING ALLERGENS	9
FOOD RECALLS AND WITHDRAWALS	11
What is a food recall?	11
What is a withdrawal?	11
Types of food recalls	11
Conducting food recalls	11
Initiating a food recall	12
Current list of food recalls	12
Food retailers	12
More information	12
HEALTH AND HYGIENE REQUIREMENTS OF FOOD HANDLERS	13
Responsibilities of food handlers	13
Health requirements	13
Effective hand washing	13
Hygiene requirements	13
Use of gloves	14
Employer responsibilities	14
Food Safety Supervisor	14
PEST CONTROL IN FOOD BUSINESSES	15

Common pests.....	15
Where do pests hide?	15
SAFE PREPARATION OF RAW EGG PRODUCTS.....	17
Use safer alternatives	17
Foods that contain raw eggs need extra care	17
Requirements for raw egg products	17
Food laws.....	18
More information	19

INFORMATION PACK FOR MWIP BUSINESSES

The information provided in this pack relates to businesses within the NSW Food Authority's Manufacturer and Wholesaler Inspection Program (MWIP).

The NSW Food Authority is a through chain food safety agency who works to ensure food produced, manufactured and sold in NSW is monitored and safe at each step it goes through – from paddock to plate.

All food sold in NSW must be safe, suitable and correctly labelled to provide customers with the information they need to make informed decisions.

It is the responsibility of all food businesses to conduct due diligence and remain up to date with legislative requirements to ensure they are producing safe food for their customers.

The NSW Food Authority has a variety of information and guidance materials on our website and we strongly recommend that you review all materials that may relate to the food you are producing.

Obligations for food businesses

All food businesses must comply with the relevant parts of the Food Standards Code, including:

- Standard 3.2.2 Food Safety Practices and General Requirements
- Standard 3.2.3 Food Premises and Equipment
- Part 1.2 Labelling and other information requirements.

Issues to consider for food businesses

Anyone in charge of a food business needs to identify food safety issues and implement measures to control risks.

More information for home-based food businesses including premises design and construction, keeping cold foods properly refrigerated, cooking food thoroughly, handling food hygienically, storing food safely, product labelling and keeping records can be found on our website

More information

- Visit the NSW Food Authority website at www.foodauthority.nsw.gov.au
- Phone the helpline on 1300 552 406



MANUFACTURER / WHOLESALE FOOD INSPECTION PROGRAM

Businesses that manufacture or wholesale food in NSW fall under the NSW Food Authority's Manufacturer/Wholesaler Food Inspection Program and will be required to have inspections.

The Food Authority licenses and audits high risk food businesses (mostly primary production food businesses, hospitals and aged care facilities), while the retail food service sector (cafes, restaurants etc. serving ready-to-eat food) is generally the responsibility of local government to inspect.

The Manufacturer/Wholesaler Food Inspection Program has been initiated to ensure that food businesses not covered by licensing or local government inspections are meeting their legal responsibilities in keeping food safe for consumers.

Legal responsibilities of a food business proprietor

All food businesses in NSW are legally obliged to comply with the *Food Act 2003* (NSW), Food Regulation 2015 and the Food Standards Code (the Code). The Act and Regulation can be viewed at www.legislation.nsw.gov.au.

The Code can be downloaded for free at www.foodstandards.gov.au.

Definition of a food business

A food business is any business, enterprise or activity that involves the handling of food intended for sale, or the sale of food. They may be commercial, charitable or community based, and are included even if the handling or sale of food is on one occasion only. All food businesses in NSW that manufacture or wholesale food and are not required to be licensed with the Food Authority need to notify the Food Authority of their operations. At a very small scale it may include [home-based businesses](#).

Inspections

The Food Act 2003 allows an enforcement agency (the Food Authority) to appoint authorised officers who have the power to inspect food businesses for compliance with the legislation (see factsheet Powers of authorised officers).

Inspection frequency is based on risk and performance; i.e. the type of food being handled and sold (e.g. pre-packaged vs freshly made) and previous compliance history of the business.

If serious food safety issues are identified during an inspection, the inspection frequency will be increased.

Authorised officers will focus on a number of areas to ensure compliance with legislation.

These include:

- cleaning and sanitising of food contact surfaces
- temperature control (e.g. temperature of stored and displayed foods)



- hygiene of food handlers (e.g. hand washing, not working while ill)
- pest control
- construction and maintenance of the premises
- maintaining a food recall program
- Allergen management
- food handling practices (e.g. minimising cross contamination), and
- sale of food that is safe, and suitable and correctly labelled.

Costs

There is an annual administration charge, prescribed in the Regulation, which may be imposed on those businesses that receive at least one inspection in the twelve month period. It covers the cost of functions including the provision of advice for food handlers, web based educational resources, a helpline, newsletters, factsheets and administration. There is also an hourly fee for inspecting the food businesses.

The charge does not apply to a food business that operates for the sole purpose of raising funds for a community or charitable cause or a business that is operating a fully compliant externally audited food safety program.

How the charge is calculated

The charge for each premises operated by the food business is based on the number of full-time equivalent food handlers (based on a 38 hour week) working at the premises. Staff involved solely in administrative, register/checkout or clerical tasks are not considered to be food handlers.

The number of full-time equivalent (FTE) food handlers is calculated as follows:

No. of food handlers x hours each spends handling food per week ÷ 38 hrs = FTE

Example:

A small mixed business selling pre-packaged food and general merchandise employs 3 people who each spend approximately 13 hrs a week on food handling activities. The rest of their time is spent on non-food related work.

3 x 13 hrs = 39hrs ÷ 38 = approx. 1 FTE food handler

Maximum administration charge

Number of FTE food handlers working at the premises Maximum charge per premises

Up to and including 5 \$390

More than 5 but not more than 50 \$800

More than 50 \$3500

More information

- See factsheet Powers of authorised officers
- Visit Food Standards Australia New Zealand (FSANZ) website: www.foodstandards.gov.au/Pages/default.aspx



CLEANING AND SANITISING IN FOOD BUSINESSES

Cleaning and sanitising help to prevent the growth and spread of organisms that cause foodborne illness, and help to reduce the activity of pests in a food premises

All food businesses are required to comply with Standard 3.2.2, Clause 19, of the Food Standards Code, which states that a food premises, including the fixtures, fittings and equipment, is to be maintained to a standard of cleanliness where there is no accumulation of:

- garbage and recycled matter
- food waste
- dirt
- grease
- other visible matter.

Note: 'Cleanliness' means that surfaces are clean to touch and free of visible matter, and without a bad odour. Cleaning and sanitising of special equipment

In the food industry, cleaning and sanitising are two separate and important issues.

Under Standard 3.2.2, Clause 20, of the Food Standards Code, a food business must ensure that all eating and drinking utensils and food contact surfaces of equipment are both clean and sanitised.

Cleaning generally involves the following steps:

1. Scraping, wiping or sweeping away food scraps and rinsing with water
2. Washing using hot water and detergent to remove grease and dirt (protective gloves may be required)
3. Rinsing off any loose dirt or detergent residue. What is sanitising?

Sanitising is the process of applying heat and/or chemicals (or other approved processes) to a clean surface to reduce the number of bacteria and other organisms to a safe level. Sanitising can be performed using a dishwasher or chemicals.

How to sanitise effectively

Make sure the item to be sanitised is clean. Sanitising is not effective on unclean surfaces.

Dishwasher

To sanitise with a dishwasher:

1. Use the correct type of detergent or sanitiser
2. Use the hottest rinse cycle available (economy cycle on a domestic dishwasher is not adequate)
3. Look over equipment and utensils when removing them from the dishwasher to check they are clean
4. Clean the dishwasher so there is no build-up of food residues
5. Regularly maintain and service the dishwasher according to the manufacturer's instructions.

Chemicals

Chemical sanitisers are generally chlorine-based or ammonium-based compounds. Only use chemical sanitisers that are designed for use in food premises.

Products suitable for use in food businesses are available from commercial chemical suppliers and retailers. It is recommended that you seek advice from a reputable supplier.

Dilution rates, contact times and safety instructions vary from product to product. When using and storing chemicals (including bleach), always follow the manufacturer's instructions.



Items that can fit in the sink can be washed and cleaned in the left-hand bowl and then immersed in a chemical sanitiser solution in the right-hand bowl.

If an item has been cleaned and is too large to be immersed in the right-hand bowl for sanitisation, the sanitiser solution can be applied using a spray bottle.

Figure 1: How a double bowl sink can be used to clean and sanitise eating and drinking utensils and food contact surfaces of equipment.

Bleach

Unscented bleach is a chlorine-based chemical that can be used to sanitise food contact surfaces when diluted correctly. A bleach concentration of 50 ppm is only effective when used warm (38°C). Table below shows how to dilute bleach. Contact time with the sanitiser should be at least 7 seconds.

Table 1: Using bleach as a sanitiser

How much water?	How much bleach?					
	Household (4% chlorine)		Strong domestic (6% chlorine)		Commercial (10% chlorine)	
Concentration required (ppm)	50 ppm	100 ppm	50 ppm	100 ppm	50 ppm	100 ppm
Water temp	Warm	Cold	Warm	Cold	Warm	Cold
1 litre	1.25 ml	2.5 ml	0.85 ml	1.7 ml	0.5 ml	1 ml
10 litres	12.5 ml	25 ml	8.5 ml	17 ml	5 ml	10 ml
50 litres	62.5 ml	125 ml	42.5 ml	85 ml	25 ml	50 ml

Requirements

Vinegar and methylated spirits

Vinegar and methylated spirits should not be used as sanitisers. Vinegar is a weak acid and not effective and methylated spirits can leave chemical residue on surfaces.

More information

- Phone your local council Environmental Health Officer for information about inspection findings or compliance action. They can clarify what work needs to be done and when.

- *Download the Food Standards Code – Standard 3.2.2 Food Safety Practices and General*

DECLARING ALLERGENS

Food allergies can be life threatening and are a growing concern in Australia. In fact, Australia has one of the highest allergy prevalence rates in the world. In NSW alone, food allergies occur in approximately 1 in 20 children and 2 in 100 adults.

The food industry plays a major role in helping to manage food allergies. This factsheet has been developed for all food manufacturers, food retailers and food importers to help them understand their obligations about declaring allergens to ensure it is safe for customers.

Responsibility for declaring allergens

Food manufacturers are responsible for managing the unintentional presence of food allergens.

Food retailers have a responsibility to consumers if a food allergy is disclosed. Food retailers are required to assist the customer with food menu choices by providing information on allergen content that may be present directly and/or indirectly on food menu items.

Importers are responsible for ensuring their imports are properly labelled and for providing clear and accurate information about the allergen status of their product.

Meeting requirements of the Food Standards Code

All food businesses need to meet the legal requirements of the Food Standards Code set out in:

- *Standard 1.2.3 Mandatory Warning and Advisory Statements and Declarations*

The Food Standards Code requires all food businesses in NSW to provide information about the ten most common allergens on food labels of packaged foods:

- peanut
- tree nut
- egg
- cow's milk
- fish
- crustacean
- sesame
- soy
- wheat
- lupin

Gluten and sulphites must also be declared on food labels of packaged foods.

Food businesses must ensure:



- accurate information is on a label and is given by staff selling unpackaged food made at the premises when a customer asks for it, or
- an allergen is not found in a food that was specifically requested not to contain that allergen.

Key points for managing allergens

It's important for manufacturers and retailers to:

- implement an effective allergen management plan
- train staff in food allergen risks, management and communication
- provide clear and accurate information on the allergen status of your product(s)
- have a plan in place to manage the unintentional presence of food allergens.

For importers, it's essential to:

- provide clear and accurate information on the allergen status of the imported product
- ensure their imports are properly labelled
- advise overseas suppliers about labelling requirements in the Australia New Zealand Food Standards Code.
- have a plan in place to manage the unintentional presence of food allergens.

More information

- Standard 1.2.3 Mandatory Warning and Advisory Statements and Declarations:
www.comlaw.gov.au/Details/F2011C00610
- User Guide – Standard 1.2.3 Mandatory Warning and Advisory Statements and Declarations:
www.foodstandards.gov.au/code/userguide/pages/warningandadvisoryde1403.aspx
- Food Standards Code (Food allergies and intolerances – food allergen portal):
[www.foodstandards.gov.au/consumer/foodallergies/food allergen portal/Pages/default.aspx](http://www.foodstandards.gov.au/consumer/foodallergies/food%20allergen%20portal/Pages/default.aspx)

FOOD RECALLS AND WITHDRAWALS

Food suppliers, including manufacturers and importers must have procedures in place for the recall and withdrawal of unsafe or unsuitable food. Retailers must remove recalled food from sale.

What is a food recall?

A food recall is used to remove from sale a food that poses an immediate risk to public health and safety. Food recalls are usually initiated by the manufacturer, distributor or importer and must be reported to state and commonwealth government authorities.

What is a withdrawal?

A withdrawal is action taken to remove a food product from sale even if there is no public health and safety issue. This is usually done for two reasons:

1. the product has a quality defect or has a labelling irregularity that is not a public health risk. 2. as a precaution, pending further investigation of a potential public health risk. If a public health risk is established, then the food must be recalled.

Withdrawals do not need to be notified to authorities.

Types of food recalls

A food recall is action taken to remove a food product from sale to minimise or prevent a risk to public health and safety. There are three types of recalls:

Trade level – involves removing the product from distribution centres, wholesalers and retail outlets. This type of recall may involve hospitals, restaurants and catering establishments that sell food manufactured for immediate consumption or food that is prepared on the premises. This type of recall is limited to foods that are sold wholesale or, if sold at retail, sold for immediate consumption.

Consumer level – involves recovery of the product from all points in the production, distribution and retail networks/chains including any affected product in the possession of consumers.

Mandatory recall – where the CEO of the Food Authority issues an order requiring the supplier to recall a food product.

Conducting food recalls

Under Standard 3.2.2, Clause 12, Food Safety Practices and General Requirements of the Food Standards Code, a manufacturer, wholesaler or importer of food must:

- have in place a system to ensure the recall of unsafe food,
- set out this system in a written document which can be shown to an authorised officer upon request, and
- comply with this system when recalling unsafe food.

To assist businesses in developing a food recall plan, FSANZ has a booklet titled Food Industry Recall Protocol – Information on recalling food in Australia and writing a food recall plan.

A copy of this booklet is available from the FSANZ website at
www.foodstandards.gov.au/industry/foodrecalls/firp/pages/default.aspx

To further assist businesses the Food Authority has created a food recall action plan available to download from
http://foodauthority.nsw.gov.au/Documents/industry/food_recall_action_plan.docx

Initiating a food recall

Food Standards Australia New Zealand (FSANZ) coordinates all food recalls on a national level. The NSW Food Authority is responsible for monitoring food recalls, and liaising with manufacturers, wholesalers and importers in NSW.

The majority of food recalls are initiated by businesses when food production monitoring has identified a fault, in response to public complaints, or as a result of government testing.

If a food recall is required the FSANZ and NSW Food Authority's Recall Coordinators will work with the manufacturer, importer or distributor to ensure the recall is conducted effectively.

Current list of food recalls

Details of recent national consumer food recalls can be found at
www.foodstandards.gov.au/industry/foodrecalls/recalls/Pages/default.aspx

Food retailers

It is the responsibility of all food retailers to remove all recalled product from sale. Retailers who continue to sell a recalled product are in breach of regulations.

More information

If you are considering a possible recall of food produced or distributed by your business, please:

- phone the Recall Coordinator, NSW Food Authority, on 1300 552 406
- visit the FSANZ website at www.foodstandards.gov.au/industry/foodrecalls/Pages/default.aspx
- *Standard 3.2.2 Food Safety Practices and General Requirements at:*
www.comlaw.gov.au/Details/F2012C00767

HEALTH AND HYGIENE REQUIREMENTS OF FOOD HANDLERS

A food handler is anyone who works in a food business and handles food, or surfaces that are likely to come into contact with food (e.g. cutlery, plates). A food handler may be involved in food preparation, production, cooking, display, packing, storage or service

Responsibilities of food handlers

Under the Food Standards Code, a food handler must take all reasonable measures not to handle food or food surfaces in a way that is likely to compromise the safety and suitability of food.

Food handlers also have specific responsibilities relating to health and hygiene.

Health requirements

Any food handler with symptoms or a diagnosis of a foodborne illness (such as vomiting, diarrhoea or fever) or is the carrier of a foodborne illness must:

- report that they are ill to their employer or supervisor
- not handle food if there is a reasonable likelihood of food contamination as a result of the illness
- if continuing to engage in other work on the food premises, take all practicable measures to prevent food from being contaminated
- notify a supervisor if they know or suspect they may have contaminated food.

Effective hand washing

Hand washing is one of the most important actions you can take to prevent foodborne illness.

Food handlers must:

- wash their hands using hot, soapy water and dry them thoroughly with single-use paper towels
- wash their hands whenever they are likely to be a source of contamination (after using the toilet, smoking, coughing, sneezing, using a handkerchief, eating, drinking or touching hair, scalp or body)
- wash their hands before handling ready-to-eat food and after handling raw food.

Hygiene requirements

Food handlers must:

- not eat, sneeze, blow, cough, spit or smoke around food or food surfaces
- take all practicable measures to prevent unnecessary contact with ready-to-eat food

- tie back long hair, and take all practical measures to prevent hair contaminating food
- ensure clothing is clean
- cover bandages and dressings on exposed parts of the body with a waterproof covering
- remove loose jewellery and avoid wearing jewellery on hands and wrists.

Use of gloves

The Food Standards Code does not require food handlers to use gloves.

Even when wearing gloves, in many situations it may be preferable to use utensils such as tongs or spoons.

Gloves must be removed, discarded and replaced with a new pair in the below circumstances:

- before handling food
- before handling ready-to-eat food and after handling raw food
- after using the toilet, smoking, coughing, sneezing, using a handkerchief, eating, drinking or touching the hair, scalp or body.

Employer responsibilities

A food business must:

- ensure food handlers do not handle food if there is a possibility of contamination
- maintain easily accessible handwashing facilities and supplies of hot running water, soap and single-use paper towels
- ensure all food handlers have appropriate skills and knowledge in food safety and food hygiene. This can be done either on-the-job or via formal training.

Food Safety Supervisor

Under the Food Standards Code (Standard 3.2.2) all food handlers must have general skills and knowledge in food safety and hygiene. In April 2010, a law came into effect that required certain businesses in the hospitality and retail food service sector to appoint at least one trained Food Safety Supervisor (FSS).

Training is tied to nationally recognised units of competency that exist within the Vocational Education and Training (VET) System.

To review the Food Authority's Food Safety Supervisor initiative, including training requirements, visit www.foodauthority.nsw.gov.au/retail/fss-food-safety-supervisors



PEST CONTROL IN FOOD BUSINESSES

Common pests such as rats, mice and cockroaches can carry bacteria and viruses, and can contaminate food and food contact surfaces. Pest sightings, and food contamination due to pests, result in a large number of customer complaints.

Common pests

Pests that can be present in food premises include:

- rodents (e.g. rats and mice)
- insects (e.g. cockroaches, flies and ants)
- birds (e.g. pigeons).

Where do pests hide?

Pests are generally attracted to food premises as they can provide shelter, water and a food source.

Pests are most active at night and hide in dark places, including:

- under and behind electrical, heating and cooking appliances
- under washing and hand washing facilities
- under and in boxes, packaging and food storage containers
- inside wall cavities
- in cracks and crevices
- behind equipment

In disused or 'mothballed' equipment.

The legal requirements

The Food Standards Code requires food businesses to take all practicable measures to:

- prevent pests entering the food premises
- eradicate and prevent the harbourage of pests on the food premises.

Practicable measures to prevent entry of pests include:

- sealing all holes, gaps and cracks in walls and ceilings
- installing and maintaining flyscreens to windows and door openings
- keeping doors closed when not in use
- installing weather strips at the base of doors.

Practicable measures to eradicate and prevent harbourage of pests include:



- regular checks for signs of pests
- maintaining the food premises and equipment in a clean condition (a cleaning schedule may assist)
- keeping food covered in sealed containers
- storing food, equipment and food containers above the floor
- keeping garbage storage areas clean and tidy
- removing rubbish regularly and making sure that external areas (outside bin areas) are clean and well-maintained
- removing unused equipment and fixtures from the premises
- implementing a suitable pest control program which may require the services of a licensed pest controller.

Using a licensed pest controller

While using the services of a licensed pest controller is not a legal requirement, it can help you to demonstrate that you are taking all practicable measures to eradicate and prevent the harbourage of pests. However, steps such as those listed above must also be used to demonstrate and achieve compliance.

A licensed pest controller should provide you with:

- a contract outlining what pests and areas are to be treated and the required frequency of treatments
- written reports of each treatment, including any pest activity, chemicals used and recommended actions required of the proprietor
- a map showing the location of all bait stations
- information on the chemicals used.

If you perform pest control treatments yourself, make sure that any chemicals or baits used are suitable and approved for use in food premises and do not contaminate food or food contact surfaces.

What happens after an inspection?

If an authorised officer from the NSW Food Authority or local council identifies a pest control issue that needs to be rectified, a variety of compliance actions can be initiated.

For further information on compliance action, see the NSW Food Authority Compliance and Enforcement Policy at www.foodauthority.nsw.gov.au/_Documents/industry_pdf/compliance_enforcement_policy.pdf

More information

- Your local council environmental health officer can help you with any questions you have about inspection findings or compliance action. They can help clarify what work needs to be done, and in what timeframe

SAFE PREPARATION OF RAW EGG PRODUCTS

Restaurants, cafés, bakeries and caterers that prepare raw egg products need to follow safe handling practices or use a safer alternative.

Use safer alternatives

Businesses should use safer alternatives to raw eggs in foods which are not cooked:

- use commercially produced dressings, sauces and spreads instead of making raw egg products, or
- use pasteurised egg products instead of raw eggs in ready-to-eat products (products without a further cook step) such as desserts and drinks.

If a business chooses to use raw egg products, they are responsible for ensuring that the risk of Salmonella contamination is managed. They must take steps to ensure the food they supply is safe and suitable.

Foods that contain raw eggs need extra care

Products with raw eggs have been responsible for some of the largest foodborne illness outbreaks in NSW. This is because the disease-causing organism Salmonella is often found on the shell of whole eggs. If handled incorrectly the Salmonella will then contaminate the raw egg product.

Outbreaks harm customers and can severely impact the reputation and trade prospects of a business.

Foodborne illness has been associated with:

- egg dressings, sauces and spreads (e.g. mayonnaise, aioli, egg butter)
- desserts made without an effective cooking step (e.g. tiramisu, mousse, fried ice cream)
- drinks containing raw eggs (e.g. raw egg high protein smoothies).

Requirements for raw egg products

In order to ensure the food is safe to eat, special attention must be given to the preparation, storage and handling of eggs and raw egg products, to prevent the growth of Salmonella.

Acidify raw egg products to keep them safe, using vinegar or lemon juice

To stop Salmonella from growing it is important to:

- acidify raw egg product to a pH at or below 4.2 – this can be done using vinegar or lemon juice
- check and record the pH of the acidified raw egg product with a pH meter or pH paper.

Storage and temperature control of acidified raw egg product

- Keep acidified raw egg products at or below 5°C.
- Make acidified raw egg product fresh every day in small tubs, not in bulk.
- Discard acidified raw egg product within 24 hours.



Receival and storage of eggs

- Only purchase and receive whole eggs that are:
 - clean, not cracked or leaking
 - supplied in clean packaging
 - correctly labelled (i.e. with name of the food, the supplier's name and address, and lot identification or date marking).
- Whole eggs should be refrigerated at or below 5°C, and used by the 'best before' date.

Sanitation and hygiene

This is important in preventing the spread of Salmonella to other foods made by the business.

- Clean and sanitise kitchen equipment used for making raw egg products before and after each use.
- Clean and sanitise storage containers and dressings/sauce dispensers between each batch.
- Use separate containers for each batch of food (i.e. do not top up previous dressings and sauces).
- Keep kitchen surfaces and utensils clean and dry.
- Do not wash eggs as this makes them susceptible to further contamination.

Separating egg yolk from egg white

If Salmonella is present on the egg shell, it could be spread throughout the kitchen and onto other foods by your hands. To minimise contact between the egg shell and contents:

- wash and dry hands before and after handling eggs
- use a sanitised egg separator
- do not separate eggs using bare or gloved hands
- do not separate eggs using the egg shell
- do not store liquid raw eggs.
- once whole eggs are cracked, use them immediately in the raw egg product.

Safer egg alternatives are available

- Use pasteurised pulp for foods that traditionally contain raw eggs:
 - liquid, frozen or dried forms of processed whole eggs, egg whites and egg yolks
 - sugared egg yolk (for desserts)
 - salted egg yolk (for mayonnaise, dressings and sauces).

Food laws

The food laws in NSW prohibit the sale of eggs with dirty or cracked shells because this increases the risk of contamination and foodborne illness.

Egg definitions

- 'Dirty eggs' are eggs whose shell is contaminated with visible faeces, soil or other matter (e.g. yolk, albumen, feathers)

- 'Cracked eggs' are eggs with a cracked shell (where a crack is visible to the naked eye or by candling).

In order to protect customers from the risk of foodborne illness, businesses need to comply with Standard 3.2.2, Division 3, Clause 7 to ensure that only safe and suitable food is processed.

More information

- Visit the Food Authority website at www.foodauthority.nsw.gov.au to download the following:
 - Food safety guidelines for the preparation of raw egg products
 - NSW Egg Food Safety Scheme
 - Microbiological quality of raw egg dressing
 - 4 hour/2 hour rule
- Food Standards Code (e.g. general food handling requirements, premises and equipment requirements, and labelling requirements)



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