NSW Public Works
Department of Regional NSW

POLLUTION INCIDENT RESPONSE MANAGEMENT PLAN

Muswellbrook Recycled Water Treatment Works

NSW EPA Licence No. 1593

12 September 2023

Muswellbrook Shire Council

Document Control

Version	Author	Reviewer	Date
Final Rpt No: 14026	S. de Souza	K. Fernando	02.04.2014
Update – in progress	D.Carroll	I Chetty	2020
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Version 8	I Chetty	I Chetty	06 July 2023
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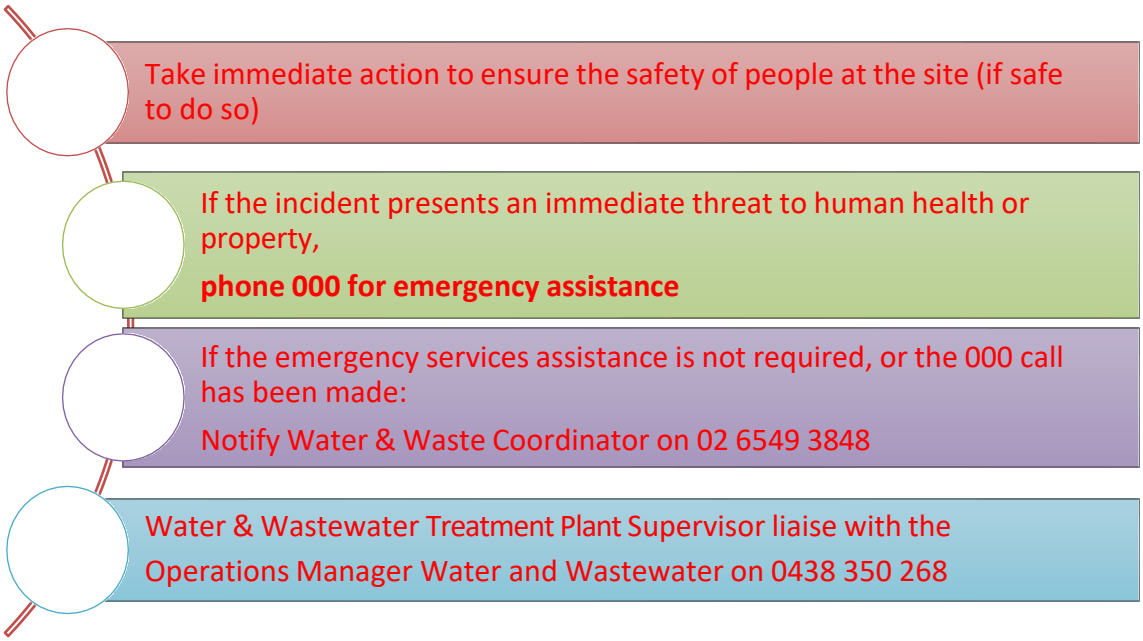
WHAT TO DO IF A POLLUTION INCIDENT OCCURS

Pollution Incident: an incident (leak, spill, or other escape of a substance) that causes or threatens material harm to the environment.

Material Harm: a harm to the environment that causes potential harm to health and safety of human beings and ecosystems, and/or results in loss or damage to property (see section 1.4).



LIST OF KEY CONTACTS

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Operations Manager (Irene Chetty)	• Must be notified of any pollution incident. • Telephone: 0438 350 268
Environmental Protection Authority (EPA)	• Must be notified of any pollution incident. • Telephone: 131 555
SafeWork NSW (Formally WorkCover)	• Must be notified of any pollution incident. • Telephone: 13 10 50
Muswellbrook Shire Council	• Must be notified of any pollution incident. • 24 Hour emergency number: (02) 65493700
Fire and Rescue NSW	• Must be notified of any pollution incident. Ask for Fire and Rescue NSW. Provide details of location of incident. • Emergency tel.: 000 Enquiries: 1300729579
NSW Health Hunter New England District	• Must be notified of any pollution incident. • Public Health Unit: 02 4924 6477
Water &Wastewater Treatment Plant Supervisor	• Must be notified of any pollution incident. • Mark Donnelly.: 0490 859 584

1 INTRODUCTION

1.1 PURPOSE

The Pollution Incident Response Management Plan (PIRMP) for the Muswellbrook Sewerage Scheme is a document developed to be used by Muswellbrook Shire Council (MSC) in the operation and management of pollution incidents at the Muswellbrook Recycled Water Treatment Works (RWTW) and the sewage collection and transport system.

1.2 OBJECTIVES

The objectives of this PIRMP are to:

- Communicate in a timely manner and with enough detail about a pollution incident.
- Minimize and control the risk of any pollution incident.
- Ensure that the plan is properly implemented.

1.3 LEGISLATIVE REQUIREMENT

Protection of the Environment Legislation Amendment Act (PEOLA) Act was introduced on 16th November 2011 to improve the way pollution incidents were reported and managed. It is designed to assist Environment Protection License (EPL) holders understand and meet their obligations and to prepare, implement, and test pollution response and recovery management plans for their licensed activities.

In accordance with Part 5.7A of the Protection of the Environment Operations Act (POEO Act), all licensees are required to prepare, keep, test, and implement a PIRMP. Part 3A of the General Regulation sets out the specific information that must be included in their PIRMP. In summary, the legislation requires:

- All licensees must prepare a PIRMP (section 153A).
- A PIRMP must be in the form required by the regulations and must include the information detailed in the POEO Act (section 153C) and the General Regulation (section 72 and section 73).
- Licensees must keep the PIRMP at the premises the environment protection licence relates to, or where the relevant activity takes place (in the case of trackable waste transporters and mobile plant) (section 153D of the POEO Act) and make certain parts of the PIRMP available on a publicly accessible website of the licensee, or alternatively provide a copy upon written request (section 74 of the General Regulation).
- Licensees must test their PIRMP in accordance with the regulations (section 153E of the POEO Act and section 75 of the General Regulation).

Licensees must implement their PIRMP immediately if a pollution incident occurs that causes or threatens material harm to the environment (as defined in section 147 of the POEO Act) (section 153F of the POEO Act).

1.4 WHAT IS A POLLUTION INCIDENT AND WHEN IS NOTIFICATION REQUIRED?

'Pollution' is defined as 'water pollution', 'air pollution', 'noise pollution', or 'land pollution' in accordance to the dictionary of the POEO Act.

What is a pollution incident?

'Pollution incident means an incident or set of circumstances during or as a consequence of which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur. It includes an incident or set of circumstances in which a substance has been placed or disposed of on premises, but it does not include an incident or set of circumstances involving only the emission of any noise.'

When does notification need to be given of a pollution incident?

Notification is required if a pollution incident causes or threatens to cause 'material harm to the environment'. Material harm is defined in section 147 of the POEO Act as:

'(a) harm to the environment is material if:

(i) it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or

(ii) it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations), and

(b) loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.'

Notification is required even where 'harm to the environment is caused only in the premises where the pollution incident occurs', as specified in section 147(2). Section 148 of the POEO Act sets out additional pollution incident notification requirements.

Figure 1. Definition of key terms according to the POEO act.

The POEO Act requires licensees to:

- implement their PIRMP if, in the course of an activity, a pollution incident occurs that causes or threatens to cause material harm (as defined in Box 1.3)
- notify any 'material harm' pollution incidents, in accordance with the requirements set out in the Act.

Part 5.7 of the POEO Act specifies when and how a person should notify each relevant authority about a pollution incident, and who is responsible for the notification. It prescribes what relevant information must be given. In summary, the licensee (or another person) is required to report a pollution incident immediately to:

- the EPA
- the Ministry of Health (via the appropriate Local Health District Public Health Unit)
- Fire and Rescue NSW
- SafeWork NSW
- the relevant local council.

The dictionary meaning of immediately is promptly and without delay. This allows response agencies to know as soon as a pollution incident is identified, so it can be dealt with quickly. The EPA's Protocol for industry notification of pollution incidents provides more details about this.

1.5 PIRMP REQUIRMENTS

The PIRMP must be:

- in written form
- available at the premises so it can be provided to an authorised EPA officer on request.

The PIRMP may form part of another document required under different legislation, as long as the information required for the PIRMP is readily identifiable in that other document.

[refer to section 71(a) and 74(1) of the General Regulation]

The PIRMP must include:

- the procedures to be followed by the licensee to notify people on the premises, people within the vicinity of the premises, the local authority for the area and all other relevant authorities as required under the legislation in the event of a pollution incident
- detailed descriptions of the actions to be taken by the licensee immediately after the pollution incident to reduce or control any pollution
- the procedures to be followed to coordinate, along with authorities and other notified persons, the actions to be taken to address the pollution caused by the incident
- the persons who will be responsible for all communications in the event of a pollution incident.

[refer to section 153C of the POEO Act]

Implementation

If a pollution incident occurs at the premises so material harm to the environment (within the meaning of section 147 of the POEO Act) is caused or threatened, the person carrying on the activity must immediately implement any PIRMP that was developed to meet the requirements of the POEO Act.

[refer to section 153F of the POEO Act]

Making the PIRMP Public

A copy of the full PIRMP must be maintained at the premises to which the licence relates, or where the relevant activity takes place, so it is readily available to the person/s responsible for implementing the PIRMP and to an authorised officer on request. Parts of the PIRMP must be made publicly available within 14 days after it has been prepared by:

- placing the PIRMP in a prominent position on a publicly accessible website of the licensee
- or if the licensee does not have a website, by providing a copy of the PIRMP, without charge, to any person who makes a written request for one.

[refer to section 153D of the POEO Act and section 74(1) and 74(2) of the General Regulation]

Testing the PIRMP

PIRMPs must be tested at least once every 12 months. They must be tested within one month of any pollution incident occurring which caused or threatened material harm to the environment (as defined in the Act).

[refer to section 75(1)(a) and 75(1)(b) of the General Regulation]

PIRMPs for all licensees must include details of: • how the PIRMP is to be tested and maintained • the dates on which the PIRMP has been tested and the names of the staff members who carried out the testing. For premises-based and mobile plant licence holders, the PIRMP must include the dates on which the PIRMP is updated.

[refer to section 72(n), 72(o), 72(p), 73(b)(vi) and 73(b)(vii) of the General Regulation]

1.6 EPA LICENCE

The facility subject to this plan is as defined by the following Environment Protection Licence (EPL): License No: 1593

Licensee: MUSWELLBROOK SHIRE COUNCIL

Premises: MUSWELLBROOK SEWAGE TREATMENT WORKS 30 SKELLATOR STOCK ROUTE

MUSWELLBROOK NSW 2333

EPA monitoring Points

1. Wet weather discharge – wet weather UV system
2. Dry weather discharge – overflow point after CCT in to emergency storage pond # 3
3. Total volume monitoring – inlet flow meter
4. Volume monitoring – pump station delivering recycled water to the Bayswater Coal mine
5. Volume monitoring – pump station delivering recycled water to the Muswellbrook Golf Course

2 PIRMP ~~SPECIFC~~ REQUIREMENTS FOR PREMISE BASED LICENCES

Section 72 of the General Regulation states that the PIRMP must include:

a) a description of the hazards to human health or the environment associated with the activity to which the licence relates (the relevant activity),

b) the likelihood of the hazards occurring, including details of conditions or events that could, or would, increase the likelihood,

c) details of the pre-emptive action to be taken to minimise or prevent a risk of harm to human health or the environment arising out of the relevant activity,

d) an inventory of potential pollutants on the premises or used in carrying out the relevant activity,

e) the maximum quantity of a pollutant likely to be stored or held at particular locations, including underground tanks, at or on the premises to which the licence relates,

f) a description of the safety equipment or other devices used to minimise the risks to human health or the environment and to contain or control a pollution incident,

g) the names, positions and 24-hour contact details of individuals who:

   (i) are responsible for activating the PIRM plan, and Guideline: Pollution Incident Response Management Plans | 8

   (ii) are authorised to notify relevant authorities under the Act, section 148, and

   (iii) are responsible for managing the response to a pollution incident,

h) the contact details of each relevant authority referred to in the Act, section 148,

i) details of the mechanisms for providing early warnings and regular updates to the owners and occupiers of premises near the premises to which the licence relates or where the scheduled activity is carried on,

j) the arrangements for minimising the risk of harm to persons who are on the premises or who are present where the scheduled activity is being carried on,

k) a detailed map, or set of maps, showing the location of the premises to which the licence relates, the surrounding area that is likely to be affected by a pollution incident, the location of potential pollutants on the premises and the location of any stormwater drains on the premises,

l) a detailed description of how an identified risk of harm to human health will be reduced, including, as a minimum, by early warnings, updates and the action to be taken during or immediately after a pollution incident to reduce that risk,

m) the nature and objectives of a staff training program in relation to the PIRM plan,

n) the dates on which the PIRM plan has been tested and the name of the person who carried out the test,

o) the dates on which the PIRM plan is updated,

p) the way in which the PIRM plan must be tested and maintained.

3 DESCRIPTION OF THE FACILITY

The township of Muswellbrook is located 230 km northwest of Sydney in the Muswellbrook Local Government Area (LGA). The sewered population is approximately 12,000. Muswellbrook Shire Council (MSC) owns and operates the Muswellbrook Sewerage Scheme that includes a Recycled Water Treatment Works (RWTW) and the collection system servicing the town.

3.1 DESCRIPTION OF THE WASTEWATER NETWORK

The Muswellbrook sewage collection system comprises the following:

- Gravity mains
- Thirteen (13) Sewage Pumping Stations (SPS)
- Rising mains (from each SPS)

Five (5) SPS's currently pump directly to the RWTW i.e., MSPS1, MSPS4, MSPS5, MSPS7 and MSPS12 as shown in **Figure 2.**

3.2 DESCRIPTION OF THE RECYCLED WATER TREATMENT WORKS

The RWTW treats raw sewage via primary (screening degritting), secondary (IDEA tanks), tertiary (rapid gravity sand filters and UV disinfection and chlorination) treatment and comprises the following process treatment units:

- Inlet works comprises inflow reception, rotary screening, grit removal and flow measurement.
- Intermittent Decant Extended Aeration Tanks (IDEATS)
- Equalisation basin
- Aerobic digester tanks
- Tertiary filters
- Disinfection system, comprising UV and chlorine contract tank
- Effluent storage tank and effluent transfer pumps
- Effluent emergency storage ponds # 2 and 3
- Septage receival system

The location of Muswellbrook RWTW is shown in **Figure 2**.

The RWTW has a total average dry weather flow (ADWF) process capacity of 3.7 ML/d and a peak wet weather flow (PWWF) capacity of 33ML/d. Screened and de-gritted sewage is distributed to two IDEA tanks; fine bubble aeration is installed in each tank to provide air during the aeration phase.

Treated effluent goes through the equalisation basin, followed by tertiary treatment involving filtration in rapid gravity sand filters and then disinfected using UV and chlorine.

The filtered and disinfected effluent is then stored in the recycled water tank, through a chlorine contact tank, from where it is utilized for backwashing, site reuse and non-potable reuse at Mt Arthur mine and the local golf course.

A rising main along Skellatar Stock Route and Rutherford Road delivers recycled water from the RWTW by a pump station to a storage pond at the Golf Club as shown in **Figure 4.**

A rising main along Thomas Mitchell Drive delivers effluent from the RWTW by an effluent pump station adjacent the eastern end of Effluent Pond #3 to an effluent booster pump station on Carramere Rd that pumps into Mt Arthur effluent dams.

Prior to 1997 effluent from the RWTW was discharged to a wetland system before entering Ramrod Creek.

In 1997 MSC entered into a partnership with the Bayswater Colliery (now HVEC/BHP) to prevent effluent from entering Ramrod Creek by pumping effluent from the RWTW to constructed wetlands. The effluent was reused by the mines and golf club under respective reuse agreements. The agreement to reuse effluent at the mines expired in 2009.

A contract between MSC and Hunter Valley Energy Coal Pty was signed in 2008 for the purchase of treated effluent for a period of 10years until 20 June 2019 in which Mt Arthur mine would continue to take all effluent that was not utilised by the golf course. A new contract was signed with Mt Arthur on 29 June 2019 and has since been extended to 30 June 2024.

The terms of the contract require that "MSC use it's best endeavours to produce treated effluent of the following quality":

- pH – 6.5 – 8.5:
- Biological Oxygen Demand (BOD) – <15 mg/L;
- Total Suspended Solids (TSS) – <20 mg/L;
- Fecal Coliforms – <150 cfu/100mL;
- Oxidized Nitrogen – <12mg/L;
- Total Phosphorous – <3mg/L;
- Alkalinity as CaCO3 – <200mg/L; and
- Total Hardness – <200mg/L

The RWTW and the collection system operate under Environmental Protection License (EPL) No. 1593 (Ref 1) granted by the NSW Environment Protection Authority (EPA) and is renewed annually.

The reuse system and effluent quality for reuse are not specifically referenced in the EPA license however, the reuse components located at the RWTW have been included in this PIRMP.

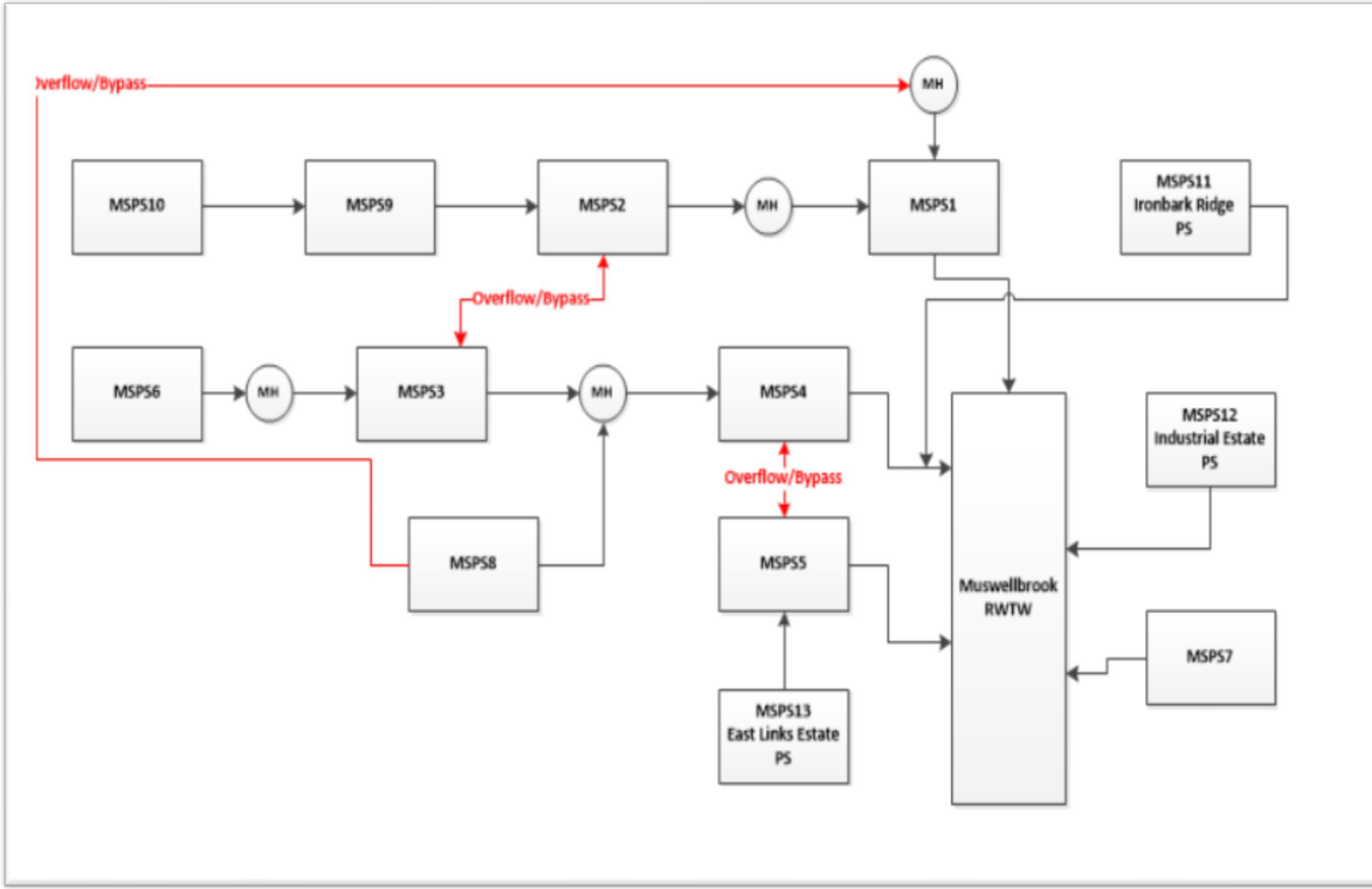


Figure 2. Pump station network diagram.

Figure 3 – Location of Muswellbrook RWTW

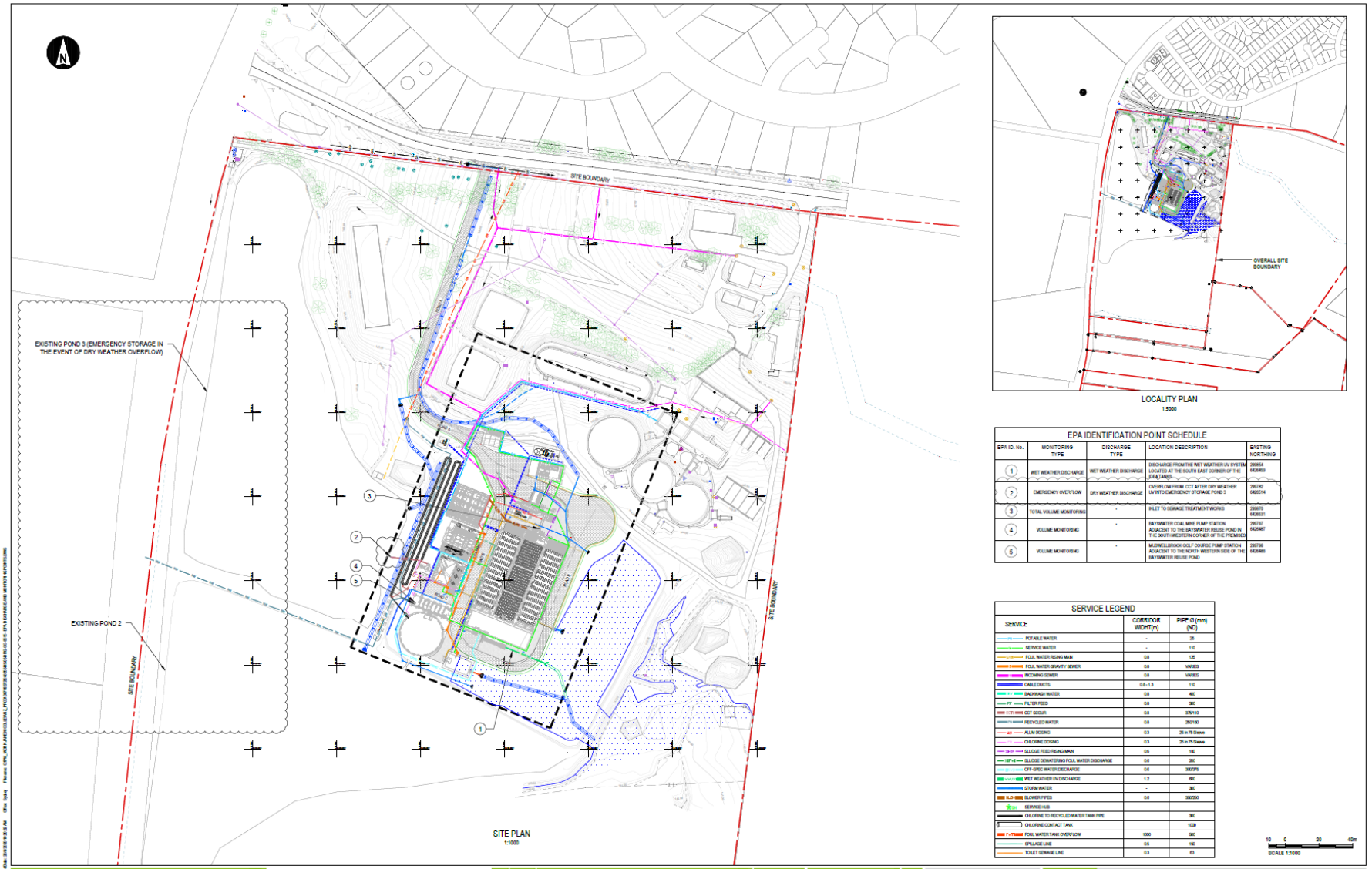


Figure 4 – RWTW Plan showing outlets

Figure 5 Muswellbrook Reuse Scheme

4 DESCRIPTION AND LIKELIHOOD OF HAZARDS

Several potential hazards to human health and the environment associated with MSC's operations exist. Related to the operation of Muswellbrook RWTW, the following have been identified as potential hazards to human health and the environment:

- Uncontrolled sewage discharge from the network
- Uncontrolled sewage discharge from treatment facility (including partially treated)
- Uncontained sewage sludge or biosolids release / discharge
- Uncontained hazardous chemical spill at the RWTW
- Effluent discharge/release outside of EPA Licence conditions
- Uncontrolled odour release.

The action plans below describe:

- Identified causal factors which could result in exposure to a hazard
- Pre-emptive actions to minimize risk
- Action to be implemented during and after a pollution incident to avoid or reduce the risk of the hazard.

4.1 HAZARD 1: SEWAGE DISCHARGE FROM THE NETWORK

This is the most common type of pollution and is likely to occur throughout the life span of the asset.

Wet weather, chokes, equipment failure and power failure are typical causes for discharge of sewage from the wastewater network. Fire, natural disaster, vandalism, and terrorism are also situations that may cause an incident.

Untreated sewage discharge poses the following hazards to human health and/or the environment:

- Potential for ecological damage caused by salinity, toxic ion, pH, nutrient, or trace element levels within the wastewater
- Potential exposure to pathogens causing disease such as bacteria, parasites, and viruses
- Potential for exposure to gasses and odour

Each pumping station has its own pre-emptive and post incident (overflow) measures. The general action plan for minimising risk is given in **Table 1**, for a more specific description of the hazard, its causes, likelihood of happening, its impacts and pre-emptive actions taken at the pump stations, please refer to the following documents:

- Details & Preventative and Post Incident Measures, Risks and Risk Minimising Actions
- SPS Risk Register

Table 1. General Action Plan - minimising risk of uncontrolled sewage discharge from the network and minimising consequences.

Causal Factor	Pre-emptive actions	Actions taken during/after pollution incident
Wet Weather & Dry Weather Overflow (Storm Intensity greater than design standards for system capacity)	Existing Controls: • Alarms for HL, Pump/Power Failure & Telemetry System • Standby pump • Above 1 in 100yr flood level Work Method: • Yearly inspection & testing by pump contractor (mechanical) • Quarterly inspection & testing of electrics by electrical contractor • Weekly inspection and routine maintenance by Operators • Overflow Notification Protocol • Provision of Emergency storage	• Assess if the incident is a pollution incident and to what degree (minor/moderate/major). Refer to SPS Risk Register. • Follow Incident communicatio n protocol. • Ensure MSC's 'Incident Action Plan (IAP) is followed. • Ensure all authorities specified in the IAP are notified. • Attempt containment • Bypass • Tankering • Clean-up • Review PIRMP as required (1 month from incident)
Power Failure at MSPSs		
Mains break/choke or equipment failure at MSPS (Including natural disaster)		
Fire causing asset failure	• Fire alarms • Staff training • Control of ignition sources • Regular maintenance of equipment	
Vandalism/terrorism causing asset failure	• Security fencing • Monitoring of asset operation and performance • Staff training	

Each incident is different and can have its own risk and circumstances depending on the nature, location, magnitude etc. Hence, the response is coordinated by the Water & Wastewater Treatment Plant Supervisor who would implement appropriate community liaison processes as described in the Communicating with Neighbours and the Community Guidelines.

4.2 HAZARD 2: SEWAGE DISCHARGE FROM THE TREATMENT FACILITY (INCLUDING PARTIALLY TREATED)

Incident where the release of untreated or partially treated sewage from the treatment plant can occur throughout the life span of the treatment facility. Usually, pollution incidents at treatment plants require both wet weather and failure of equipment to occur simultaneously. Incidents like terrorism, vandalism, complete biological failure, and natural disaster also increase the likelihood of untreated/partially treated wastewater release.

Untreated sewage discharge poses the following hazards to human health and/or the environment:

- Potential for ecological damage caused by salinity, toxic ion, pH, nutrient, or trace element levels within the wastewater
- Potential exposure to pathogens causing disease such as bacteria, parasites, and viruses
- Potential for exposure to gasses and odour

The General Action Plan for minimising risk of uncontrolled sewage discharge from the treatment facility (including partially treated) and minimising consequences is provided in **Table 2**. Storage quantities of wastewater and sludge that may result in an uncontrolled sewage discharge from the treatment facility are outlined in **Table 6.** For a more specific description of the hazard, its causes, likelihood of happening, its impacts and pre-emptive actions taken at the treatment facility, please refer to the following document:

- RWTW Risk Register

Actions implemented to minimize exposure to the sewage discharges:

- Minimizing discharge volumes
- Minimizing the number of locations where outflows occur
- Containing discharge
- Cleanup of discharge

To assist the operators following a pollution event, several safe and accessible sampling locations have been suggested in **Appendix A**. To reduce response time, clear access paths have been provided.

Each incident is different and can have its own risk and circumstances depending on the nature, location, magnitude etc. Hence, the response is coordinated by the Water & Wastewater Treatment Plant Supervisor who would implement appropriate community liaison processes as described in the Communicating with Neighbours and the Community Guidelines.

Table 2. General Action Plan - minimising risk of uncontrolled sewage discharge from the treatment facility (including partially treated) and minimising consequences.

<table>
<tr><th>Causal Factor</th><th>Pre-emptive actions</th><th>Actions taken during/after pollution incident</th></tr>
<tr><td>Wet Weather & Dry Weather Overflow
(Storm Intensity greater than design standards for system capacity)</td><td rowspan="3"><u>Existing Controls:</u>
• Alarms for HL, pump/power failure & telemetry system
• Mechanical screening & grit classifier alarmed, bypass channel and bar screen
• All flows through IDEA - wet weather overflows from high level outlet structure equalization basin then receives UV disinfection before release to Ramrod Creek.
<u>Work Method:</u>
• Routine maintenance
• Daily inspection & management
• At least one (1) operator onsite every day, if hazardous event occurs during “out of hours”, three (3) operators “on-call” and response time is 1hour</td><td rowspan="7">• Assess if the incident is a pollution incident and of what degree (minor/moderate/major).
Refer to RWTW Risk Register.
• Follow Incident communicatio n protocol.
• Ensure MSC’s ‘Incident Action Plan (IAP) is followed.
• Ensure all authorities specified in the IAP are notified.
• Review PIRMP as required (1 month from incident)
• Investigate source of influent (Biological failure)</td></tr>
<tr><td>Power Failure at MSPSs</td></tr>
<tr><td>Equipment Failure</td></tr>
<tr><td>Fire</td><td>• Fire alarms
• Staff training</td></tr>
<tr><td>Vandalism/terrorism causing asset failure</td><td>• Security fencing
• Monitoring of asset operation and performance
• Staff training</td></tr>
<tr><td>Biological Failure</td><td>• Effluent quality testing
• Staff training
• Equipment maintenance</td></tr>
<tr><td>Natural Disaster</td><td>• Equipment maintenance
• Staff training
• Field safety equipment for handling and containing raw sewage</td></tr>
</table>

4.3 HAZARD 3 : SOLIDS WASTE OR SLUDGE RELEASE/DISCHARGE

Solids derived from the Muswellbrook RWTW will include:

- Screenings and grit generated at the inlet works
- Activated sludge wasted from the bioreactors into the digesters
- Dewatered biosolids disposed into bins at the dewatering sludge presses

Biosolids produced at the RWTW are disposed of, through a contract with Loop Organics, at the Ravensworth Bisolids Composting Facility.

The main hazards to human health and/or the environment resulting from uncontrolled discharge or release of sewage sludge or biosolids discharges are:

- Potential for exposure to pathogens such as bacteria, parasites, and viruses
- Potential for ecological damage caused by pH, nutrient, salinity, toxic ion or trace element levels within the material

Unintended discharge or release of sewage sludge or biosolids may occur due to the failure or breakages in sludge wasting discharge piping or overflow at the dewatering presses and biosolids bins.

Table 3. Action plan for minimising risks from sewage sludge or biosolids spills.

<table>
<tr><th>Causal Factor</th><th>Pre-emptive actions</th><th>Actions taken during/after pollution incident</th></tr>
<tr><td>Operator error</td><td rowspan="2"><u>Existing Controls:</u>
• Alarms for equipment/ pump /power failure & telemetry system
• Sludge handling procedures and equipment.
• Bunded loading areas
<u>Work Method:</u>
• Routine maintenance
• Operator inspection & management whilst dewatering which occurs during work hours
• Equipment maintenance
• Staff training</td><td rowspan="2">• Follow Incident communication protocol.
• Ensure MSC’s ‘Incident Action Plan (IAP) is followed.
• Attempt containment
• Tankering
• Cleanup.
• Ensure all authorities specified in the IAP are notified.
• Review PIRMP as required (1 month from incident)</td></tr>
<tr><td>Equipment failure</td></tr>
<tr><td>Biosolids not classified/transported /applied in accordance with the NSW Biosolids Guidelines</td><td>• Sample and classify biosolids in accordance with NSW Biosolids
• Guidelines</td><td>• Blend biosolids with in-spec biosolids to meet required classification.</td></tr>
</table>

4.4 HAZARD 4: CHEMICAL SPILLS

There are only three chemicals stored onsite, aluminium sulphate (or alum) and sodium hypochlorite (or chlorine solution) and polymer. The alum is stored in two 5000 L tanks, the chlorine is stored in a 5000 L tank and polymer is delivered to the dewatering sludge press shed in 1000 L containers. A Chemical Safety Data Sheet (SDS) is provided which contains a summary of the chemicals and response. Refer to attached Safety Data Sheets at the end of this document.

The main hazards to human health and/or the environment resulting from chemical spills or leaks are dependent upon the nature of the chemical but could include:

- Potential for death or serious injury from acute exposure to the chemical
- Potential for ecological damage

Site specific action plans are provided in the following documents:

- RWTW Risk Register
- SPS Risk Register

According to the MSDS the following clean up measures are recommended for alum, chlorine, caustic and polymer respectively:

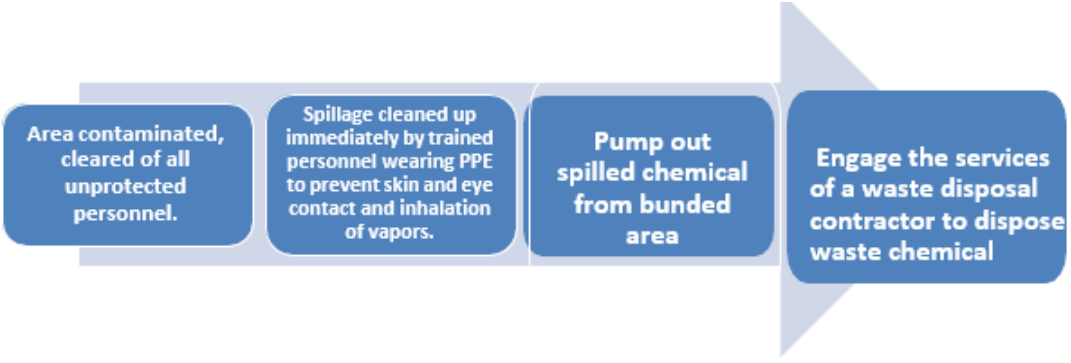


Figure 5. SDS General Clean-up Procedures: Alum and Chlorine

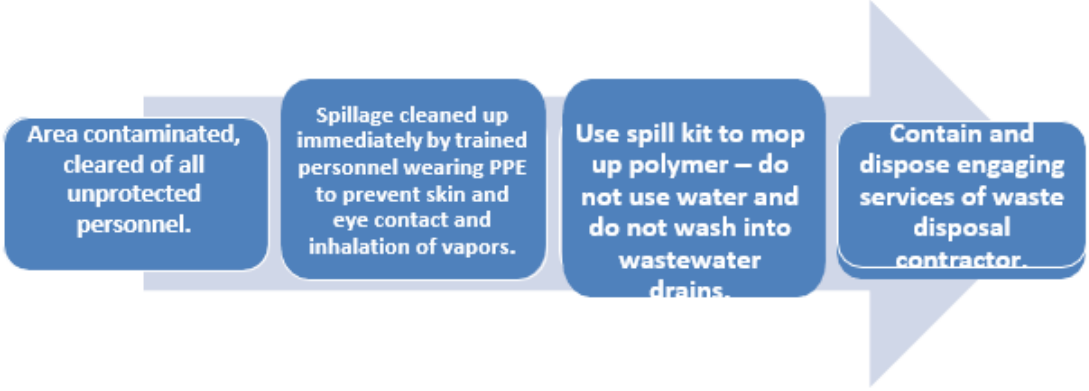


Figure 6. SDS General Clean-up procedures: Polymer

Table 4. Action plan for minimising risk arising from a chemical spill or leak.

Contributing factor	Pre-emptive actions	Actions taken during/after pollution incident
Deliveries	Existing Controls: • Design and Operation to relevant standards including barriers and bunding • Bund drains stormwater or contains spills via valve operation • Spill kits Work Method: • Operational Controls – Emergency Stop provided on the control panel. • Contractor safe work methodology, procedures, and equipment	• Follow SDS • Follow MSC's Incident Action Plan (IAP) • Attempt containment • Tankering • Cleanup. • Ensure all authorities specified in the PIRMP are notified of the incident • Review PIRMP as required (within 1 month of incident)
Equipment failure	Existing Controls: • No chemicals are used or stored at the sewer pumping stations • At RWTW leak will stop when source is depleted. Dosing is not within public area. • Leak is contained within in bunded areas. Work Method: • Undertake routine weekly operator checks • Undertake recommended OEM service maintenance works on chemical dosing systems • Staff Training	
Asset corrosion	• Design for safety • Monitoring and maintenance	
Vandalism or Terrorism	• Alarms in RWTW and fenced. • Fenced off PS site	

The following actions are implemented to minimize exposure to the chemical spills:

- Training and PPE.
- Separation of personnel to spill areas.
- Access for vacuum truck removal instead of personnel access.
- Minimising discharge volumes.
- Containing discharge.
- Clean up of discharge.

Each incident is different and can have its own risk and circumstances depending on the nature, location, magnitude etc. Hence, the response is coordinated by Water & Wastewater Treatment Plant Supervisor who would implement appropriate community liaison processes as described in the Communicating with Neighbours and the Community Guidelines.

CHEMICAL SPECIFIC RESPONSE

A response to chemical spills or leaks will be addressed as detailed in the SDS. MSC also has relevant SWMS and procedures to respond to chemical spills and leaks. These are:

- Hazardous Chemicals and Dangerous Goods V3 SWMSCI001
- Delivery and Handling of Sodium Hypochlorite at Water and Wastewater Treatment Plants V2 SWMSSWW004
- Dry Weather UV & Chemical Room SWMSRWTW012
- Hazardous Chemicals Procedure

These documents are available on MSC's safety management system "SafeHold" to all staff.

4.5 HAZARD 5: EFFLUENT DISCHARGE/RELEASE OUTSIDE OF LICENCE CONDITIONS

Effluent produced at the RWTW is fully ~~is~~ reused by the golf course and Mt Arthur Mine complex owned by HVEC. Effluent discharge to the Hunter River occurring is unlikely, but can occur, as seen in the June 2007 "Hunter Flood Event" which saw treated effluent discharged to the Hunter River (SOE Report).

This could be due to equipment failure, operator error, civil works, natural disasters, or during civil works on treatment plant infrastructure or pipelines.

The main environmental risk is the possibility of ecological damage from discharge of effluent into the Hunter River outside of dilution limits, which could alter pH, nutrient, salinity, toxic ion, or trace element levels. There are no potential human health impacts.

Table 5. Action plan for minimising risks from unplanned effluent discharge outside of EPL conditions.

Contributing factor	Pre-emptive actions	Actions taken during/after pollution incident
Civil Works on Infrastructure Equipment failure	<u>Work Method</u> • Duty and standby infrastructure to allow works to be undertaken whilst still maintaining quality requirements. • Onsite storage available in Pond #2. • Staff training. • Works communication framework and planning. • Communication with Mine Operations. <u>Operator Resourcing</u> • At least one (1) operator onsite every day, if hazardous event occurs during "out of hours", three (3) operators "on-call" and response time is 1hour <u>Existing Controls</u> • PS alarm to operator via telemetry	• Follow SDS • Follow MSC's Incident Action Plan (IAP) • Ensure all authorities specified in the PIRMP are notified of the incident • Attempt containment • Bypass • Clean-up • Review PIRMP as required

Operator error for unintended release	Work Method • Operation plans, procedures, checklists and manuals • daily inspection & management (temporary bypass around affected unit).	(within 1 month of incident) • Holding wastewater flows back in the wastewater network • Stop supply of effluent to recycled water customers
Vandalism or Terrorism	• Alarms • Fenced off site • Staff training • Operational monitoring	

Actions implemented to minimize exposure to the sewage discharges:

- Minimizing discharge volumes
- Containing discharge
- Clean-up of discharge

Each incident is different and can have its own risk and circumstances depending on the nature, location, magnitude etc. Hence, the response is coordinated by Water & Wastewater Treatment Plant Supervisor who would implement appropriate community liaison processes as described in the Communicating with Neighbours and the Community Guidelines.

4.6 HAZARD 6: UNCONTROLLED ODOUR RELEASE

A discharge of highly odorous material from a wastewater treatment works or wastewater network is an incident that is somewhat likely to occur over the life of the asset. Main breaks, chokes, excessive detention times, impaired process controls and civil works are the factors that can increase the risk of exposure to odours and potentially harmful gaseous discharges.

The main potential sources of odour at the proposed new RWTW are:

- reception of incoming sewage flows at the plant inlet works structure
- sludge storage and treatment units

The main hazard to human health resulting from the release of an odorous discharges are acute health impacts such as vomiting breathing or airway difficulty nausea, headaches, or dizziness.

Table 6. Action plan for minimising risks from uncontrolled odour release.

Causal Factor	Pre-emptive actions	Actions taken during / after pollution incident
Mains break/choke or equipment failure (resulting in spill or leak)	• Equipment maintenance • Emergency storage • Remote shutdown • Tankering	• Follow SDS • Follow MSC's 'Incident Action Plan (IAP) • Ensure all authorities specified in the PIRMP are notified of the incident • Attempt containment • Bypass • Clean-up • Review PIRMP as required (within 1 month of incident) • Holding wastewater flows back in the wastewater network • Implement contractor emergency response plans • Re-seeding (biological failure)
Excessive detention times in network	• Vents/scours • Filters • Chemical Dosing • Potable water top up	
Inadequate WWTW infrastructure/process controls	• Operational Upgrades • Process monitoring • Ducting & Extraction fans to exhaust foul air • Covering of inlet works channels	
Civil works on infrastructure	• Staff training • Operational plans, • procedures, checklists and manuals	
Biological failure	• Wastewater quality testing • Equipment maintenance • Staff training	

5 POTENTIAL POLLUTANT INVENTORY

The chemicals and pollutants used or generated because of operating the Muswellbrook sewerage scheme comprise:

- Sodium Hypochlorite (chlorine)
- Aluminum Sulfate (alum)
- Caustic Soda
- Polymer
- Raw Sewage
- Tertiary sludge and dewatered biosolids
- Effluent

Safety Data Sheets (SDS) representative of each of the chemicals used in the sewage treatment process are attached at the end of this document.

5.1 CHEMICALS

The following chemicals are used at the Recycled Water Treatment works.

Table 7. Pollutant List – Chemicals.

Chemical (Common Name)	Location	Chemical Name & Formula	Typical Analysis	Use	Amount Stored
Sodium Hypochlorite	Muswellbrook RWTW	Sodium Hypochlorite	~ 13% % NaOCl solution	Disinfection	5 000 L
Alum	Muswellbrook RWTW	Aluminium Sulphate (Liquid)	47% Aluminum Sulphate solution	Phosphorous removal	20 000 L
Caustic Soda	Muswellbrook RWTW	Caustric soda (Liquid)	30% Sodium Hydroxide solution	pH correction	10 000 L
Polymer	Muswellbrook RWTW	FLOPAM	EM640 HIB	Odour Control	2 000 L

5.2 SEWAGE AND EFFLUENT

The other potential pollutants are:

- Sewage (within the collection system and at head of the RWTW) –. All raw sewage is processed in intermittent decanted extended aerator tanks and aerated digesters.
- Effluent produced at the RWTW (treated and pumped to customers: Mt Arthur and Golf Course)
- Biosolids produced at the RWTW (disposed at Ravensworth Composting Facility)
- Foul water at the RWTW (recycled back into the inlet works of the treatment process)
- Grit and screenings (inlet works) – collected and disposed at the Muswellbrook Waste Facility.

Table 8. Pollutant List – Raw Sewage and Effluent.

Parameter	Typical Raw Sewage1	Typical Recycled Water Quality
Biochemical oxygen demand (BOD)	110 to 350 mg/L	<20 mg/L[3]
Suspended solids (SS)	250 to 300 mg/L	<30 mg/L[3]
Total nitrogen (TN)	40 to 70 mg/L	<30 mg/L[3]
Ammonia	12 to 45 mg/L	<1 mg/L[4]
Total phosphorus (TP)	4 to 12 mg/L	<5 mg/L[3]
Oil and grease (O&G)[2]	50 to 100 mg/L	<10 mg/L[3]
Faecal coliforms, FC	104 to 108 cfu/100 mL	<1000 cfu/100 mL[5]
pH	6.5 - 8.5	6.5 - 8.5[3]

1. Taken from Table 3.15 Eddie and Metcalf
2. Grease Traps lower raw sewage concentration O&G levels considerably and figures for domestic sewage in regional NSW with grease traps at source are usually much less.
3. EPA POEO Licence requirements for wet weather river discharge (EPL 1593)
4. Former Sensitive Waters river discharge requirements
5. Requirements from "Guidelines for Sewage Systems — Use of Reclaimed Water"

6 SAFETY EQUIPMENT

Safety equipment or other devices that are onsite will minimize the risks to human health or the environment and contain or control a pollution incident. These will include any personal protective equipment (PPE), safety data sheets (SDS), monitoring devices and spill containment equipment.

The following PPE safety equipment is provided onsite:

Table 7. List of PPE on site.

Personal Protective Equipment	Location	Location
Hearing protection	RWTW	On site at the treatment plant blower, dewatering and amenities buildings.
Protective gloves	RWTW	On site at the treatment plant chemical building and amenities building.
Dust mask	RWTW	On site at the treatment plant and amenities building.
Safety glasses	RWTW	On site at the treatment plant chemical building and amenities building.
Self-contained breathing apparatus (SCBA)	RWTW	On site at the treatment plant.
Hazardous safety suits (white disposable)	RWTW	On site at the treatment plant.

7 POLLUTION INCIDENT NOTIFICATIONS

7.1 ENVIRONMENTAL INCIDENT NOTIFICATION AND REPORTING PROCEDURES

Following a pollution incident, MSC has devised an Incident Action Plan (IAP) that outlines the procedures to take and relevant authorities to notify. This can be accessed through the following link:

- Incident Action Plan- IAP

7.2 COMMUNICATION DURING POLLUTION INCIDENTS

To determine the appropriate communication strategy for an incident, the incident or “Impact” needs to be categorized. Once categorized the prescribed communication strategy can be deployed.

Pollution incidents are currently managed via Council’s, Sewer Spills or Overflows” checklist, and “Sewer Incident Notification Protocol”.

- MSC Sewer Spill or Overflow Procedure
- MSC Sewer Incident Notification Protocol

The notification procedures documented in the PIRMP are based on protocols detailed in the Sewer Notification Protocol and triggers consistent with “Impacts” detailed in Table 2 of the Assessment of the Risks.

- Assessment of the Risks

7.3 ASSESS THE IMPACT OF THE INCIDENT

The following details the three classes of incidents.

MINOR Incident:

Managed by routine procedures/work practices.

- Area affected – small and localized
- Clean up – Easy and without additional assistance
- Waterway/Environment – Not Sensitive
- Risk of material harm to humans and/or environment – No

MODERATE Incident:

Further investigation may be required and assessment of management options over the short term. Operations and maintenance adjusted to reduce the consequences, likelihood, and exposure.

- Area affected – more than one (1) property
- Clean up – Moderate and without additional assistance
- Waterway/Environment – Not Sensitive
- Risk of material harm to humans and/or environment – Yes

MAJOR Incident:

Further detailed investigation and assessment of management options is required; immediate review and adjustment of operations and maintenance to reduce the consequences, likelihood, and exposure; clean-up and notification procedures become high priority.

- Area affected – many properties
- Clean up – Substantial with additional assistance
- Waterway/Environment – Sensitive
- Risk of material harm to humans and/or environment – Yes

7.4 WHO WILL YOU NOTIFY?

The following incident notification process will be undertaken for the identified incident levels.

MINOR Incident

- The RWTW Operator will report MINOR incidents to the Water & Wastewater Treatment Plant Supervisor ASAP
- The Water & Wastewater Treatment Plant Supervisor to report to the Operations Manager within the day of the incident.

MODERATE Incident – Notifiable

- The RWTW Operator will report MODERATE incidents to the Water & Wastewater Treatment Plant Supervisor IMMEDIATELY.
- The Water & Wastewater Treatment Plant Supervisor will report to the Operations Manager IMMEDIATELY.
- The Operations Manager will alert the MSC Director of Community Infrastructure IMMEDIATELY
    - If overflows occur - The Operations Manager will report SIGNIFICANT OR HIGH-RISK incidences IMMEDIATELY to NSW Health and NSW EPA and MSC Director of Community Infrastructure.
    - If public affected call NSW Health
- MSC Director of Community Infrastructure will notify affected community, MSC General Manager, and Communications Team.
- MSC Director of Community Infrastructure will also notify Environmental Health Officer and water quality sampling and testing program will be undertaken, if required by qualified and independent personnel.

MAJOR Incident - Notifiable

The RWTW Operator will report MAJOR incidents to the Water & Wastewater Treatment Plant Supervisor and Emergency Services IMMEDIATELY.

The Water & Wastewater Treatment Plant Supervisor will report to the Operations Manager and Emergency Services (if not previously contacted) IMMEDIATELY.

The Operations Manager will alert the MSC Director of Community Infrastructure and Emergency Services (if not previously contacted) IMMEDIATELY.

If overflows occur - The Operations Manager will report SIGNIFICANT OR HIGH-RISK incidences IMMEDIATELY to NSW Health and NSW EPA and MSC Director of Community Infrastructure.

If public affected, call NSW Health

MSC Director of Community Infrastructure will notify affected community post liaison with NSW Health. The MSC Director of Community Infrastructure will also notify the MSC General Manager and Communications Team.

This notification process is shown schematically in Incident Communication Protocols and forms part of the operator training and awareness.

Incident reporting includes communicating the incident and documenting the incident. For Notifiable Incidents, notification will consist of:

- Ringing NSW EPA's Pollution Line of 131555.
- Notification within of 48 hours of Council being aware of the overflow/bypass incident and provision (by fax or email) of completed "Record of Sewer Overflow" report within a week after the incident to the following bodies:
- NSW Health;
- NSW EPA;
- NSW Dept of Planning and Environment (NSW DPE);
- Council's Corporate and Community Services Section and
- Council's Environmental Services Section.

Contact details are provided in the "Sewer Incident Notification Protocol" document:

- **MSC Sewer Incident Notification Protocol**

Figure 9. Key Contacts.

7.5 WHAT INFORMATION MUST YOU PROVIDE TO AUTHORITIES?

Information to be collected in the event of an overflow or bypass from the reticulation system, at a sewage pumping station or a sewage treatment plant will include but not be limited to:

- The location of the overflow/bypass and a description of the receiving environment;
- Date, estimated start time and duration of event.
- Volume of overflow/bypass.
- Classification of overflow/bypass due to dry (e.g., power and mechanical equipment failure) and/or wet (i.e. due to heavy rainfall) weather;
- Probable cause of the overflow/bypass;
- Actions taken to stop overflow/bypass from occurring;
- Clean-up activities undertaken; and
- Mitigating actions to prevent overflow/bypass from recurring.

7.6 MINIMISING HARM TO PERSONS ON THE PREMISES

Attendance Register

An attendance register (visitor's books) is in place at the RWTW. All visitors and contractors to the site log details of visit in the visitor book.

Site Induction

Visitors are instructed to report to the amenities building where they are inducted and sign a visitor's book. All visitors are always accompanied by a Council employee.

Contractors and visitors are instructed by the relevant manager prior to visiting site.

Visitor's book. Is shown in the document below:

- Site Induction for Contractors & Visitors

Evacuation Procedure

The evacuation procedure is depicted on a plan displayed in the amenities building and the RWTW switch room building.

Emergency Assembly Point

The emergency assembly point is at the front gate near the entrance to the RWTW.

8 TRAINING AND TESTING

A systematic review of the plan will be undertaken by the Operations Manager annually or within one month of an incident occurring at the plant. The evaluation will,

- Assess the relevance of the risk assessment against the current state of the plant
- Identify any emerging problems and trends
- Assess the communication between Council, Council operational staff and regulators
- Assist in determining priorities for improving procedures
- Assessment of incidents and responses determined
- Determine when and what is to be audited in the next six months

The evaluation of results described above will be documented and the plan updated. Evaluation will be reported to the Council stakeholders.

Auditing of the pollutant inventory is to be done annually.

An audit may also be triggered by a significant incident or if the process chemical is changed.

9 ASSESSMENT OF THE RISKS

A desktop risk assessment has been undertaken by NSW PW and reviewed by Muswellbrook Council staff. The objective of the assessment was to:

- identify the hazards,
- identify hazardous events
- assessment of the likelihood of the event and other factors that may increase the likelihood
- assess the impacts
- assess the overall risk.

Shown in **Risk Tables, 1, 2** and **3** are the likelihood, impact and risk criteria used in the assessment.

Risk Table 1: Definitions of Likelihood

Level	Likelihood	Description
A	Almost certain	The event is expected to occur often (several times per year)
B	Likely	The event will probably occur often (once every 1-3years)
C	Possible	The event might occur at some time (once every 3 to 10years)
D	Unlikely	The event could occur at some time (once every 20years)
E	Rare	The event may occur only in exceptional circumstances (once every 100 years)

Risk Table 2: Definitions of Impact

Level	Classification	Description
1	Insignificant	The overflow is extremely unlikely to drain to a local sensitive environment* and: • Where the overflow reaches waters, the volume of contaminant likely to enter the waterways is insignificant with regard to the volume and flow of receiving waters, or • Where the overflow reaches land, it is likely to be contained in an area with little chance of public exposure within the maximum response time**
2	Minor	The overflow is unlikely to drain to a local sensitive environment* and: • Where the overflow reaches waters, the volume of contaminant likely to enter the waterways may be significant with regard to the volume and flow of receiving waters, or • Where the overflow reaches land, it is likely to be contained in an area where the public exposure is minimal given the maximum response time**

3	Moderate	The overflow is likely to drain to a local sensitive environment* and: • Where the overflow reaches waters, the volume of contaminant likely to enter the waterways is significant with regard to the volume and flow of receiving waters, or • Where the overflow reaches land, it may travel to an area where public exposure is low within the maximum response time**
4	Major	The overflow is likely to drain to a local sensitive environment* and: • Where the overflow reaches waters, the volume of contaminant likely to enter the waterway is high with regard to the volume and flow of receiving waters, or • Where the overflow reaches land, the public exposure risk is likely given the maximum response time**
5	Catastrophic	The overflow is likely to drain to a local sensitive environment* and: • Where the overflow reaches waters, the volume of contaminant likely to enter the waterways is high with regard to the volume and flow of receiving waters, or • Where the overflow discharges to land, the public exposure risk is high given the maximum response time**

*A sensitive environment includes: a drinking water catchment or domestic groundwater source, or shellfish growing area, or protected water bodies, ecological communities or conservation areas defined by legal an non-legal instruments, such as local environment plans (LEPs), State environmental planning policies (SEPPs), national parks, and class P or class S waters, or waterways used for primary contact recreation, or a recreational area or other area with high public exposure o associated health risk.

**Maximum response time should be based on the length of time taken for the licensee to detect the overflow, or for the overflow to be reported, and the time taken for the licensee to attend the site and secure against public contact

Risk Table 3: Risk Analysis Criteria

Likelihood	Impacts				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Almost Certain - A	Low	Moderate	High	Very High	Very High
Likely - B	Low	Moderate	High	Very High	Very High
Possible - C	Low	Moderate	Moderate	High	Very High
Unlikely-D	Low	Low	Moderate	High	Very High
Rare - E	Low	Low	Low	Moderate	High

Muswellbrook Collection System Details

Name	Age	Condition	Collection catchment	Other contributing catchments	Discharge catchment	Sensitive receivers	Proximity to sensitive receivers		
MSPSl	>90% 25-50 years old	80% in FAIR condition	Catchment #1	MSPS2 (indirect)	RWTW	Residences	250m to Hunter River		D/S
MSPS2	60% 25-50 years old	90% FAIR to GOOD condition	Catchment #2	MSPS9 (direct)	M/H in Catchment #1	Wetland (discharges to Sandy Creek) , Karoola Park, Residences	300m to Sandy Creek (which joins Hunter River). 400m to Hunter River	pumped to MSPS3 OR polishing wetland which joins Sandy Creek	U/S
MSPS3	70% 25-50 years old	80% FAIR to GOOD	Catchment #3	MSPS6 (indirect)	M/H in Catchment #4	Karoola Park, Stormwater Basin	800m to Sandy Creek (which joins Hunter River). 900m to Hunter River	via gravity main to MSPS2	U/S
MSPS4A	95% 25-50 years old	80% FAIR condition	Catchment #4	MSPS3 (indirect), MSPS8 (indirect)	RWTW	Golf Course, New England Hwy	375m to Golf Club Storage Dam, 300m to Muscle Creek	MSPS5	D/S
MSPS5	60% 25-50 years old	70%GOOD condition	Catchment #5		RWTW	Golf Course, Residences	150m to Golf Club Storage Dam, 75m to Muscle Creek	MSPS4A	D/S
SPS6	100% 5 years old	new	Catchment #6		M/H in Catchment #3	Railway line, Sandy Creek, Sub-divided land for residential development	150m to Sandy Creek. 800m to Hunter River		U/S
MSPS7	100% 25-50 years old	100% FAIR condition	Catchment #7		RWTW	Residences	350m to Hunter River		D/S
MSPS8	90% 24-50 years old	90% FAIR condition	Catchment #8		M/H in Catchment #4	Residences	10m to Possum Gully (eventually joins the Hunter River)	Catchment #1 reticulation OR Possum Gully which contains a gross pollutant trap prior to Hunter River (Possum Gully runs through the backs of residences in some places)	D/S
MSPS9	100% 10-24 years old	100% VERY GOOD condition	Catchment #9	MSPSl0 (direct)	MSPS2	Wetland, Sandy Creek	30m to Sandy Creek (which joins Hunter River). 100m to Hunter River	polishing wetland which joins Sandy Creek	U/S
MSPSl0	100% 10-24 years old	100% VERY GOOD condition	Catchment #10		MSPS9	Hobby farm/crops, Residence, New England Hwy	100m to Sandy Creek. 720m to Hunter River		U/S

Muswellbrook SPS Details

Pump Station (PS) ID	ADWF (L/s) incl flows from other catchments (gravity/pumped)	PWWF (L/s) incl flows from other catchments (gravity/pumped)	No. of pumps	Pump Capacity (L/s/pump)	SYSTEM STORAGE						TELEMETRY		ALARMS			ODOUR CONTROL				SIGNAGE			
					Pump Well Capacity (kL)	- DRY weather (mins)					Telemetry ?		High Water Level Alarm	Pump Failure Alarm ?	Intrusion Alarm ?	Chemical Dosing ?		Other		PS Number ?	Warning Signs ?	Chemical Hazmat Placard ?	PS Fenced ?
MSPS1								630.0															
MSPS2		36.8	2x11kW	27.0	40.5	123	18	114.3	7.9	0.9		SMS					FeCl stored in PS						
MSPS3	8.5		2x40kW	75.1	246.5	483			8.3	0.0		SMS					FeCl stored in shipping container next to PS						
MSPS4A	16.5	106.5	2x105kW	125.0	45.3	46		44.7	15.1	0.1		SMS							Vent & Carbon Filter				
MSPS5		137.4	2x70kW & 1x75kW	112.0	200.0	285	24	142.2	8.8	0.3		SMS							Odour Bed				
MSPS6	2.3	17.4	2x15kW	28.4	7.6	55		6.1	1.7	0.1		SMS											
MSPS7	1.0	9.7	2x5.9kW	10.0	34.3	572	59	10.0	12.0	0.3		SMS											
MSPS8	3.7	25.7	2x25kW	62.5	25.9	117	17	25.7	3.9	0.3		SMS											
MSPS9	0.8	8.9	2x5.9kW	34.0	24.9	518		54.0	26.6	1.7		SMS											
MSPS10	0.3	6.1	2x2kW	17.8	30.3	1683	83		62.6	2.0		SMS					PS						

Muswellbrook SPS – Preventative Measures, Risks AND Risk Minimisation Actions

	SPS	MSPS1	MSPS2	MSPS3	MSPS4A	MSPS5	MSPS6	MSPS7	MSPSB	MSPS9	MSPS10
A	**Preventative & Post Incident (overflow) Measures**										
	Reliable power supply ?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	>4hrs detention ?	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes
3	Adequate pumping capacity ?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	Standby pump installed ?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	Generator connection points	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	Telemetry & alarms installed?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	Above 1 in100yr flood level ?	Yes	Yes	Yes	Yes				ra	?	Yes
8	SPS Within 50m of Residences ?	Yes	Yes	No	No	No	Yes	Yes	Yes	No	Yes
9	Within 200m of Waterway ?	No	No	No	No	Yes	Yes	No	Yes	Yes	Yes
10	Overflow/bypass option ?	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No
	No. of contributing sewer catchments	4	3	2	4	1	1	1	1	2	
11	SPS Overflow Protocol	Yes - General Overflow procedure for all SPS									
12	Short response times	Yes - One operator "on-call" every day, response time is generally within 1hour									
B	**Assessed LIKELIHOOD of overflow (Dry/Wet)**	Unlikely	Likely	Unlikely	Rare	Rare	Rare	Unlikely	Unlikely	Unlikely/Possible	Rare/Unlikely
C	**Assessed IMPACT of overflow (Dry/Wet)**	Minor	Moderate	Moderate	Moderate	Moderate	Moderate	Minor	Moderate	Major	Moderate
D	**Overall RISK**	LOW	HIGH	MODERATE	LOW	LOW	LOW	LOW	MODERATE	HIGH	LOW/ MODERATE
E	**Actions to minimise RISK**	*Examine if infiltration is an issue & address* *Install overflow/bypass OR Establish protocol for dealing with situation at* MSPS1 *Test overflow option to ensure works when needed* *Follow Overflow Protocol (inc Notification Protocol)*	*Investigate* System *hydraulics* *Examine if infiltration is an issue & address* *Test overflow option to ensure works when needed* *Follow Overflow Protocol (inc Notification Protocol)*	*Examine if infiltration is an issue & address* *Test overflow option to ensure works when needed* *Follow Overflow Protocol (inc Notification Protocol)*	*Test overflow option to ensure works when needed* *Follow Overflow Protocol (inc Notification Protocol)*	*Test overflow option to ensure works when needed* *Follow Overflow Protocol (inc Notification Protocol)*	*Install overflow/bypass OR Establish protocol for dealing with situation at* MSPS6 *Test overflow option to ensure works when needed* *Follow Overflow Protocol (inc Notification Protocol)*	*Install overflow/bypass OR Establish protocol for dealing with situation at* MSPS7 *Test overflow option to ensure works when needed* *Follow Overflow Protocol (inc Notification Protocol)*	*Examine if infiltration is an issue & address* *Test overflow option to ensure works when needed* *Follow Overflow Protocol (inc Notification Protocol)*	*Examine if infiltration is an issue & address* *Test overflow option to ensure works when needed* *Follow Overflow Protocol (inc Notification Protocol)*	*Examine if infiltration is an issue & address* *Install overflow/bypass OR Establish protocol for dealing with situation* MSPS10 *Test overflow option to ensure works when needed*

Risk Assessment
Muswellbrook Recycled Water Treatment Works (RWTW) and Collection System

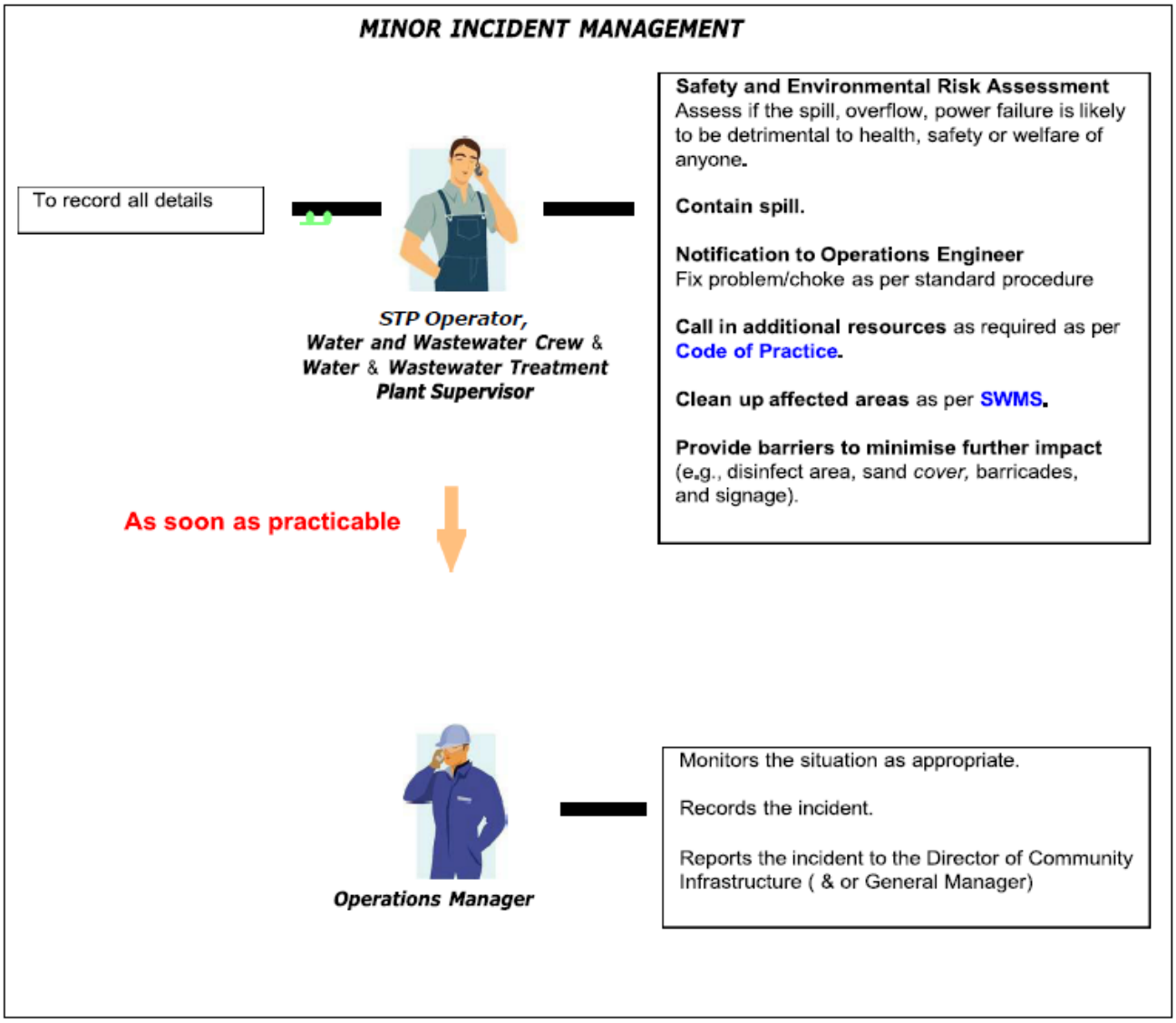
	Contaminent	Description of the Hazardous Event	Risk Category: th (Public Health & Environ			Likelihood Almost certain - several times per year Likley - once every 1 - 3 years Moderate - once every 3 - 10 years Unlikley - once every 20 years Rare - once every 100 years	Events or Cicumstances that would accerbate or increase likehood		Impact Insignificant Minor - Short term low level Moderate - Short term low level large population Major - Severe illness or death small population Catastrophic - Severe illness or death large population	Assessed Risk Low Moderate High Verh High	Pre-emptive Actions (Exitsing Controls) In addition to operator training, SWMS	Pre-emptive Actions (Required)	Action
													Immediate
	STP												
1	Effluent	High wet weather inflow to STP causing overflows			✓	Unlikely			Minor	Low	Plant designed to handle PWWF All inflows pumped. Telemetry system. Operator attendance within 1 hour		Notify Water and Wastewater Supervisor.
2	Effluent	High wet weather inflow to STP causing poor quality			✓	Likley			Minor	Low	Storm flow into eqaualisation basin - then through the wet weather UV SCADA/telemetry system. Operator attendance within 1 hour	Operator inspection,	Notify Water and Wastewater Supervisor.
3	Effluent	Recycled water doesn't meet quality requirements			✓	Likley	Filters offline, no chlorine		Minor	Low	Recycled water overflow, drainage, CCT pipe off spec to foul water tank - to head of plant or Ramrod Creek SCADA/telemetry system. Operator attendance within 1 hour	Operator inspection,	Notify Water and Wastewater Supervisor.
4	Effluent	Recycled water doesn't meet quality requirements			✓	Moderate	Filters offline, no chlorine		Minor	Low	Recycled water PS overflow to onsite pond#3. SCADA/telemetry system. Operator attendance within 1 hour	Operator inspection,	Notify Water and Wastewater Supervisor.
5	Effluent	Poor quality - sabotage of plant			✓	Rare			Minor	Low	Locked gates. Locked building. Telemetry system	Operator inspection,	Notify Water and Wastewater Supervisor.
6	Effluent	Poor quality - extended power failure			✓	Unlikely			Minor	Low	Reliable power system. Long outages would be planned. Units will provide some treatment. Standby generators. Telemetry system		Notify Water and Wastewater Supervisor.
7	Effluent	Poor quality - equipment failure			✓	Unlikely			Minor	Low	Standby capacity - screening and converyor, blower, UV. Telemetry system. Operator attendance in less than 1 hour.	Remove sludge regularly	Notify Water and Wastewater Supervisor.
8	Chlorine	Tank leak or failure			✓	Unlikely	Stop valve left open		Moderate	Low	Bunding.		Notify Water and Wastewater Supervisor.
9	Chlorine	Spill during filling operation			✓	Unlikely	Stop valve left open		Minor	Low	Bunding of transfer area. Unloading pump stop control panel located beside the unloading bund. Control valve on bund.	Bunding of tranfer area	Notify Water and Wastewater Supervisor.
10	Chlorine	CCT tank scour			✓	Moderate			Minor	Low	Scour to allow CCT to be emptied to onsite pond#3.		Notify Water and Wastewater Supervisor.
11	Alum	Tank leak or failure			✓	Unlikely	Stop valve left open		Moderate	Low	Bunding.		Notify Water and Wastewater Supervisor.
12	Alum	Spill during filling operation			✓	Unlikely	Stop valve left open		Minor	Low	Bunding of transfer area. Unloading pump stop control panel located beside the unloading bund. Control valve on bund.		Notify Water and Wastewater Supervisor.
13	Caustic	Tank leak or failure			✓	Unlikely	Stop valve left open		Moderate	Low	Bunding.		Notify Water and Wastewater Supervisor.
14	Caustic	Spill during filling operation			✓	Unlikely	Stop valve left open		Minor	Low	Bunding of transfer area. Unloading pump stop control panel located beside the unloading bund. Control valve on bund.		Notify Water and Wastewater Supervisor.
15	Screening and grit	Screenings overflows - washed then taken off site			✓	Unlikely			Minor	Low	Multiple bins and variable conveyor, drained area.		Notify Water and Wastewater Supervisor.
16	Dewateringh System	Sludge overflow			✓	Unlikely			Minor	Low	Overflow to foul water PS. Drainage to bund area. SCADA/telemetry system. Operator attendance within 1 hour.		Notify Water and Wastewater Supervisor.
17	Septage receival	Odour			✓	Unlikely			Minor	Low	Odour control system provided.		
18	Inlet works	Odour			✓	Unlikely			Minor	Low	Odour control system provided.		
19	Dewateringh System	Odour			✓	Unlikely			Minor	Low	Odour control system provided.		
	SPS												
20	Sewage	Overflow to creek - extended power failure			✓	Unlikely			Minor	Low	Reliable power system. Long outages would be planned. Access to vacuum truck. Alarms for HL, power and pump failures. Operator response less than 1 hour.		Notify Water and Wastewater Supervisor.
21	Sewage	Overflow to creek - extended power failure unplanned			✓	Unlikely			Minor	Low	Reliable power system. Some emergency storage provided. Alarms for HL, power and pump failures. Operator response less than 1 hour. Generators available. Vacuum truck available.		Notify Water and Wastewater Supervisor.
22	Sewage	Overflow to creek - pump failure			✓	Unlikely			Minor	Low	Duty and standby Pumps. Alarms for HL, power and pump failures. Telemetry system. Operator response less than 1 hour		Notify Water and Wastewater Supervisor.
23	Sewage	Overflow to creek - electrical failure			✓	Unlikely	Wet weather event		Minor	Low	Telemetry system. Alarms for HL, power and pump failures. Operator response less than 1 hour. Generator. Emergency storage	Tanker on standby	Notify Water and Wastewater Supervisor.
24	Sewage	Overflow to creek - flooding of SPS			✓	Unlikely			Minor	Low	Telemetry system. Operator response less than 1 hour. Diesel generator. Emergency storage	Tanker on standby	Notify Water and Wastewater Supervisor.
	Gravity System												
25	Sewage	Overflow due to blockage			✓	Moderate			Minor	Low	Operator to call in tanker Operator response less than 1 hour once notified. Small volumes		Notify Water and Wastewater Supervisor.

9 Actions to be Undertaken During or Immediately After a Pollution Incident

9.1 Minor Incident Action Plan (IAP)

The action plan for the following minor incidents is shown in **Figure 1:**

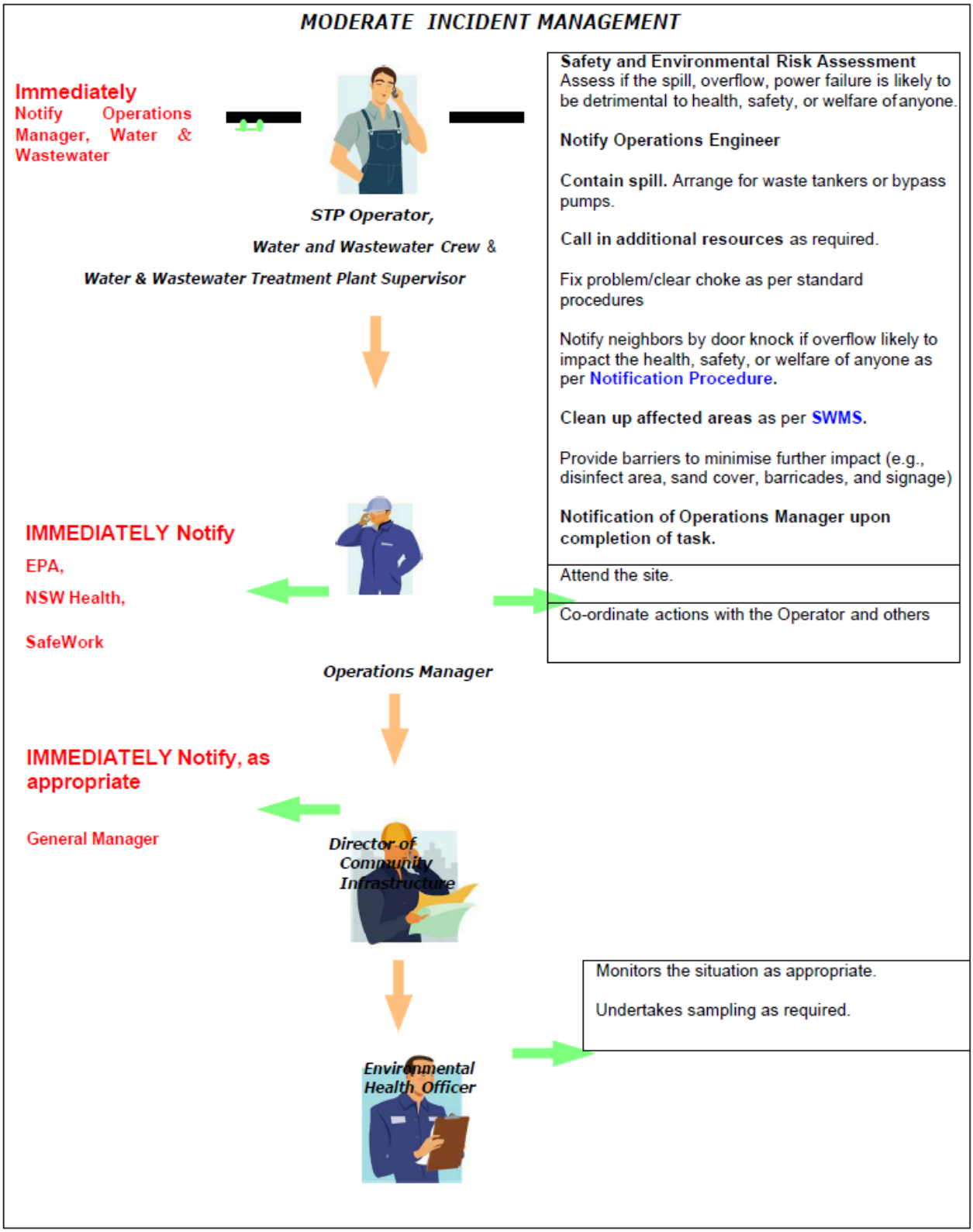
Figure 1. Minor Incident Action Plan



9.2 Moderate Incident Action Plan (IAP)

The action plan for the following moderate incidents is shown in **Figure 2:**

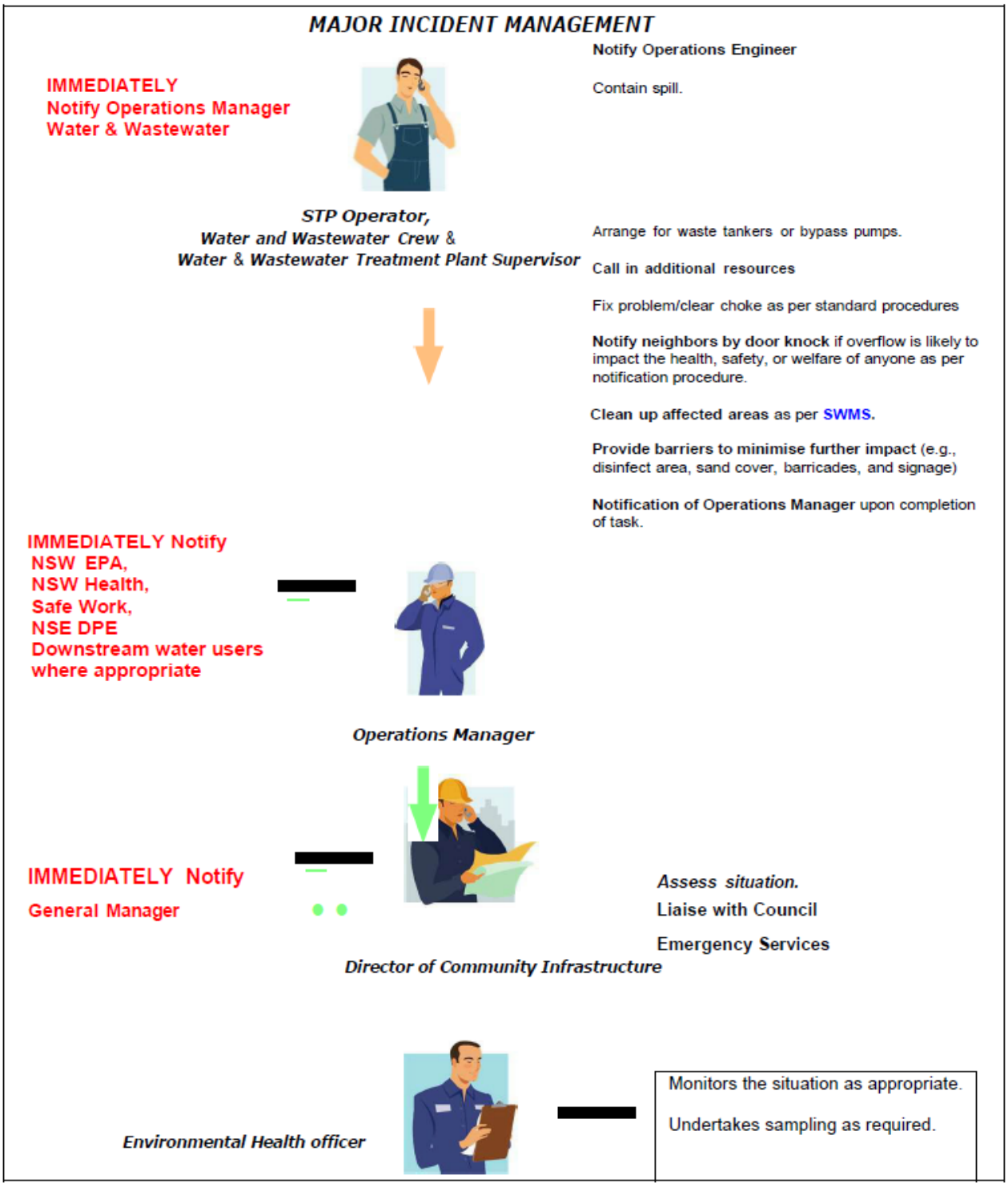
Figure 2. Moderate Incident Action Plan



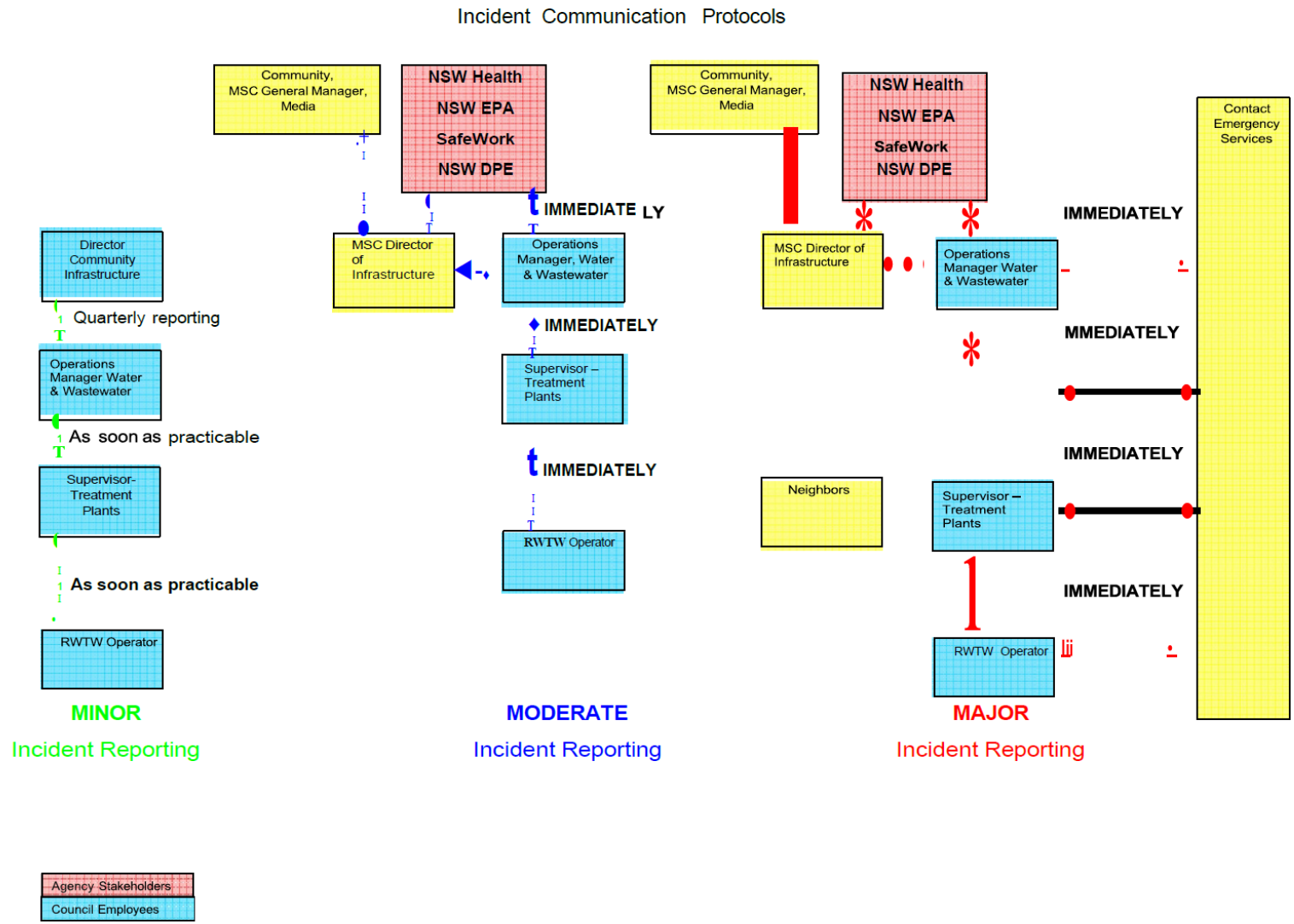
9.3 Major Incident Action Plan (IAP)

The action plan for the following major incidents is shown in **Figure 3:**

Figure 3: Major Incident Action Plan (IAP)



10 Incident Communication Protocols



11 Sewer Incident Notification Protocol

OBJECTIVE:

The objective of this protocol is to ensure that all relevant organisations and members of any affected communities are notified of overflows and sewage treatment bypasses that have caused or are likely to cause adverse impacts on the environment or public health.

The Notification Protocol is a requirement of the Department of Environment, Climate Change & Water (DECCW) environmental protection licenses for Muswellbrook Sewage Treatment Plant (license #1593) and Denman Sewage Treatment Plant (license #5059) are held by Muswellbrook Shire Council.

DEFINITION OF EVENTS

Overflows

Sewer overflows are discharges to the environment of raw or partially treated sewage from sewerage systems. These releases onto private property, streets & other public areas and into waterways may come from designed overflow structures, sewer access manholes, sewage pumping stations, pipes and sewage treatment plants. Sewer overflows can occur in both dry and wet weather conditions.

Possible causes of Overflows

Overflows from the sewer system may arise from the following causes;

- □ Excessive inflow and infiltration into sewers due to rainfall;
- □ Blocked, broken or cracked pipes;and/or
- □ Failure of pumps and other equipment or failure of the power supply to sewage pumping stations or the sewage treatment plant.

Treatment Plant Bypass

Treatment Plant Bypasses are when raw or partially treated sewage bypasses part or all of the sewage treatment plant and is discharged to the environment. This may be a purpose built part of the treatment process to intercept and partially treat flow in excess of the capacity of the whole or part of the treatment plant. These untreated or partially treated discharges will be from the existing, licensed discharge point. If the discharge is from another point in the treatment plant it will be treated as an overflow.

Possible causes of Treatment Plant Bypass

- Wet Weather Bypass - this will occur when inflow and infiltration into sewers, due to rainfall, elevates the flow entering the Treatment Plant to a level that the Treatment Plant is unable to treat any additional flow (plant is operating at full capacity). When this occurs, the portion of flow over and above the plants capacity will bypass the plant (or part of the plant);
- Dry Weather Bypass - this could occur due to the failure of pumps, other equipment at the Treatment Plant or the power supply to the Treatment Plant

NOT/FICA TION PROCEDURE

Triggers for Notification

- □ Raw sewage or partially treated sewage (which has not received the required treatment processes for the given flow rate, as specified by the DECCW licence) is discharged from the premises as a result of a bypass of the sewage treatment plant, and the bypass may pose a risk to public health;or

- An observed or reported overflow has occurred from the reticulation system, a sewage pumping station or the sewage treatment plant, and the overflow may pose a risk to public health.

Determining public health risk

This protocol aims to ensure that those members of the community who could be affected by a bypass or an overflow are informed as quickly as possible after one occurs. This does not mean that the community needs to be notified of every bypass or overflow, only those with a significant risk to publichealth.

In determining if an event is of significant risk to public health, Council's Water and Waste Manager will consult with the Department of Health Representative as identified in following sections.

Following are examples of events that would be considered to have a significant risk to public heath.

An overflow or bypass has occurred:

- In a public park or sporting field where significant usage for recreation activities is being undertaken;
- Inside the grounds of, or in close proximity to a school or child care facility; and/or
- At the treatment plant where disinfection has been compromised. This would be in conjunction with flow through areas where there is a high risk of non-ingestive public contact, or where there is insufficient dilution and natural treatment to mitigate the impacts of even limited public ingestion of receiving waters, or where receiving waters are used for commercial shellfish production. This may occur through a bypass of the disinfection process (tertiary ponds), or ineffectiveness of disinfection due to bypass of upstream treatmentprocesses.

Information to be collected

The following information is to be collected in relation to a sewage treatment plant bypass event:

- The DECC point identification number through which the bypass discharged;
- The date, estimated start time and estimated duration of the bypass;
- The estimated volume of thebypass;
- The level of treatment of the sewage at the STP prior to discharge;
- The probable cause of thebypass;
- Any actions taken to stop the bypass happening;
- Any action taken to prevent the bypass happening again; and
- Classification as dry or wet weather bypass as specified by the DECC licence.

The following information is to be collected in relation to an overflow from the reticulation system, sewage pumping station or from the sewage treatment plant:

- The location of theoverflow;
- The date, estimated start time and estimated duration of the overflow;
- The estimated volume of theoverflow;
- A description of the receiving environment of the overflow;
- Classification as a dry or wet weather overflow;
- The probable cause of theoverflow;
- Any actions taken to stop the overflow happening;
- Any actions taken to clean up the overflow; and
- Any actions taken to prevent the overflow happening again.

Groups to be notified

The need for and extent of notification of overflows will be assessed on a case by case basis as follows;

- The Director of Community Infrastructure in consultation with the Operations Manager Water & Wastewater will determine which sections of the Community have the potential to be affected and how they will be notified;
- The Director of Community Infrastructure and Operations Manager Water and Wastewater in consultation with the representative from the Department of Public Health will determine which sections of the community have the potential to be affected by the incident and how they will be notified; and
- Information provided to the Community will be sufficient to reduce the public health risk to an acceptable level.

Notification is to be given as soon as practicable by ringing NSW EPA 24/7 Pollution Line on 131 555.

Further notification to be given to the following organizations:

Within 48 hours of a Council employee becoming aware of the incident; and
The completed "Record of Sewer Overflow" will be e-mailed or faxed, within a week after the incident.

NSW Department of Health

The Department of Health is to be notified as soon as practicable following the event. The Department of Health will also be the first point of contact when it is unsure if the event is of significant risk to public health.

Contact: NSW Public Health Unit
Telephone: 4924 6477
E-mail: philippe.porigneaux@health.nsw.gov.au

The Department are to be provided with all the relevant information above that is available at the time with the remainder of the information to be supplied as it becomes available.

NSW Environment Protection Authority

The Environment Protection Authority is to be notified as soon as practicable following the event.

Contact: Pollution Incident
Telephone: 131555
E-mail: info@epa.nsw.gov.au

NSW EPA are to be provided with all the relevant information above that is available at the time with the remainder of the information to be supplied as it becomes available.

NSW DPE

The Dept is to be notified as soon as practicable following the event.

Contact: Graham Campbell
Telephone: 0419 620 990
E-mail: graham.campbell@dpie.nsw.gov.au

The Dept are to be provided with all of the relevant information above that is available at the time with the remainder of the information to be supplied as it becomes available.

Muswellbrook Shire Council Office of the General Manager

The Office of the General Manager is to be notified as soon as practicable following the event to be aware of potential for any community liaison and legal repercussions.

Contact: Derek Finnigan
Telephone: 6549 3750
E-mail: derek.finnigan@muswellbrook.nsw.gov.au

The Office of the General Manager are to be provided with all the relevant information that has been made available to the community.

Muswellbrook Shire Council's Environmental Services Section

The Environmental Health Officer is to be notified as soon as practicable following the event to be able to monitor environmental impacts and environmental health repercussions.

Contact: Claire Rozema
Telephone: 6549 3863
E-mail: claire.rozema@muswellbrook.nsw.gov.au

The Environmental Health Officer is to be provided with all of the relevant information above that is available at the time with follow up information (especially relating to cleanup, mitigation of impacts and future preventative actions) to be supplied as it becomes available.

Follow-up Action

If there is an assessed risk to public health the Operations Manager Water & Wastewater will initiate:

- a water quality sampling and testing program, to be carried out by a qualified independent person, to monitor and manage any public health threat arising from the incident.
- erection of sign posting and/or barricades, if required.

PROTOCOL REVIEW PROCESS

This protocol is to be reviewed after any incident to which this protocol applies, or on its anniversary, whichever comes first. The protocol may also be reviewed at any other time when it is apparent that changes need to be made as determined by the Operations Manager Water & Wastewater.

REFERENCES

"Licensing Guidelines for Sewage *Treatment Systems"* - NSW Environment Protection Authority

12 Sewer Spill or Overflow Procedure/Checklist & Record of Sewer Overflow Form

Sewer Spills or Overflows

Procedure/Checklist - at Manholes

1. **Sewer spill or overflow occurs:**
   - *If A/H - Notification to Council via on-call number*
   - *If 8/H - Notification to Council via W&W office where it is redirected to whoever has the on-call phone*

2. **Operator attends the site at earliest opportunity.**

3. **Carry out preliminary visual investigation** - determine situation/cause/urgency/extent of problem - **and determine whether:**

   A. Repair can be done immediately
   OR

   B. Site needs to be left unattended, to address higher priority issues elsewhere and/or obtain additional equipment/resources.

Follow steps for option A or B and complete the checklist on page 2 when finished:

page 2.

Note your suggestions for improvements to this process below or advise your supervisor or manager.

Name and Position:	**Suggestion:**
Date of suggestion: ..... / ..... /	

Checklist/Procedure for Manhole Sewer Spills

A. not leaving site	or n/a
• Undertake site specific Risk Assessment	
• Clear blockage with rod - using appropriate P.P.E.	
• If blockage remains, proceed to "jet flush" as required.	
• Clear the site of spill remnants, debris, and waste.	
• Disinfect as/ if required. *(Environmentally friendly chemical OR - Lime to mask odor)*	
If health risk residue left behind, or unable to clean thoroughly: • Cordon off affected area with orange plastic barricade mesh • Put up sewer spill signage. • Advise supervisor.	
• Schedule follow up check, and the removal of the mesh when appropriate.	
• Sign off this checklist below. • Attach to Service Request and completed Risk Assessment • Deliver to W&W Admin to register into InfoXpert • Admin to include any improvement suggestions in the agenda of next toolbox meeting for discussion - to be noted in minutes.	

B. leaving site unattended	✓ or n/a
• Undertake site specific Risk Assessment	
• Place sewer spill signage appropriately (i.e. "Caution Sewage Water")	
• Place solids barrier cage over manhole - flush to ground	
• Call for additional operator assistance if required	
• Liaise with supervisor. • Confirm if spill is 'Notifiable' • Advise of leaving site unattended	
• If 'Notifiable', call the following and advise of conditions. Operations Manager Water &Wastewater - **0438 350 268** **NSW EPA-131555** SafeWork **131 050** Fire & Rescue NSW **000**	
• Allocate someone to assess solids barrier an hour later (re: flow rate & frequency for further checking)	
• Ensure sufficient monitoring until repairs can be undertaken	
• Return to site ASAP with the required equipment/ resources • Carry out the repair work • Clean and disinfect as needed	
• Sign below • Attach to signed SR and RA • Deliver to W&W Admin to be registered in InfoXpert and suggestions included in agenda	

Signed by:_____ **Date:**____/____/____

Mu

MUSWELLBROOK SHIRE COUNCIL

PO Box 122
MUSWELLBROOK 2333
Telephone: (02) 6549 3700
Facsimile: (02) 6549 3701
Email: council@muswellbrook.nsw.gov.au

Muswellbrook Sewage Treatment Plant

Licence # 1593

RECORD OF SEWER OVERFLOW

LOCATION OF THE OVERFLOW:

Date: | **Start Time:** | **Duration:**

Where is the Blockage?

Private Property.....
Public Reserve/ Road/ Parks.....

Is there any sewer overflow escaping to Public Property?

Yes
No

If yes

Very Minor.....
Near School .....
Public Municipal Park.....
Recreational Area .....

Explanations

Criteria for Immediate Notification

Dry weather events (overflows or bypasses) that constitute a potentially increased health risk. These include those events which occur in the following circumstances:

Y Public municipal parks where significant usage for recreational activities is being undertaken or main recreational areas of National Parks and similar. Examples of an area where significant usage is parks where sporting activities are occurring at the time of the overflow.

Y Inside a childcare center or school or near schools where there is assessed to be a high risk of exposure of children to the overflow incident.

MUSWELLBROOK SHIRE COUNCIL

PO Box 122
MUSWELLBROOK 2333
Telephone: (02) 6549 3700
Facsimile: (02) 6549 3701
Email: council@muswellbrook.nsw.gov.au

Muswellbrook Sewage Treatment Plant
Licence # 1593

RECORD OF SEWER OVERFLOW

Estimated Volume of Overflow: _____

Description of the Receiving Environment of the Overflow:

Classification of the Overflow: Dry Weather Overflow..... ☐
Wet Weather Overflow ..... ☐

The Probable Cause of the Overflow:

Any Actions Taken to Stop the Overflow Happening:

Any Actions Taken to Clean Up the Overflow:

Any Actions Taken to Prevent the Overflow Happening Again:

Call NSW Health on **4924 6477** Yes / **No** ☐

Call NSW EPA on **131 555** Yes / **No** ☐

Call Operations Manager on **0438 350 268** Yes / **No** ☐

MUSWELLBR00K SEWAGE SYSTEM
License #1593
RECORD OF SEWER OVERFLOW

LOCATION OF THE OVERFLOW: (Tick & mark with X on attached map)

No.	Description of Location	Tick
1	Spillway at the north-western corner of Pond 2	
2	Spillway at the south-western corner of Pond 3 (Mt Arthur/Golf Course Reuse Pond)	
3	Inlet to sewage treatment works	
4	Mt Arthur Coal Mine pump station, adjacent to the north-western corner of pond 3 (Mt Arthur reuse pond)	
5	Muswellbrook Golf Course pump station, adjacent to the north-east corner of Pond 3 (Mt Arthur Reuse Pond)	
6	Bypass screen	
7	Other (mark on attached map)	

Date: **Start Time:** **Duration:**

Estimated Volume of Overflow:

The Level of Treatment of the Sewage at the STP Prior to Discharge:

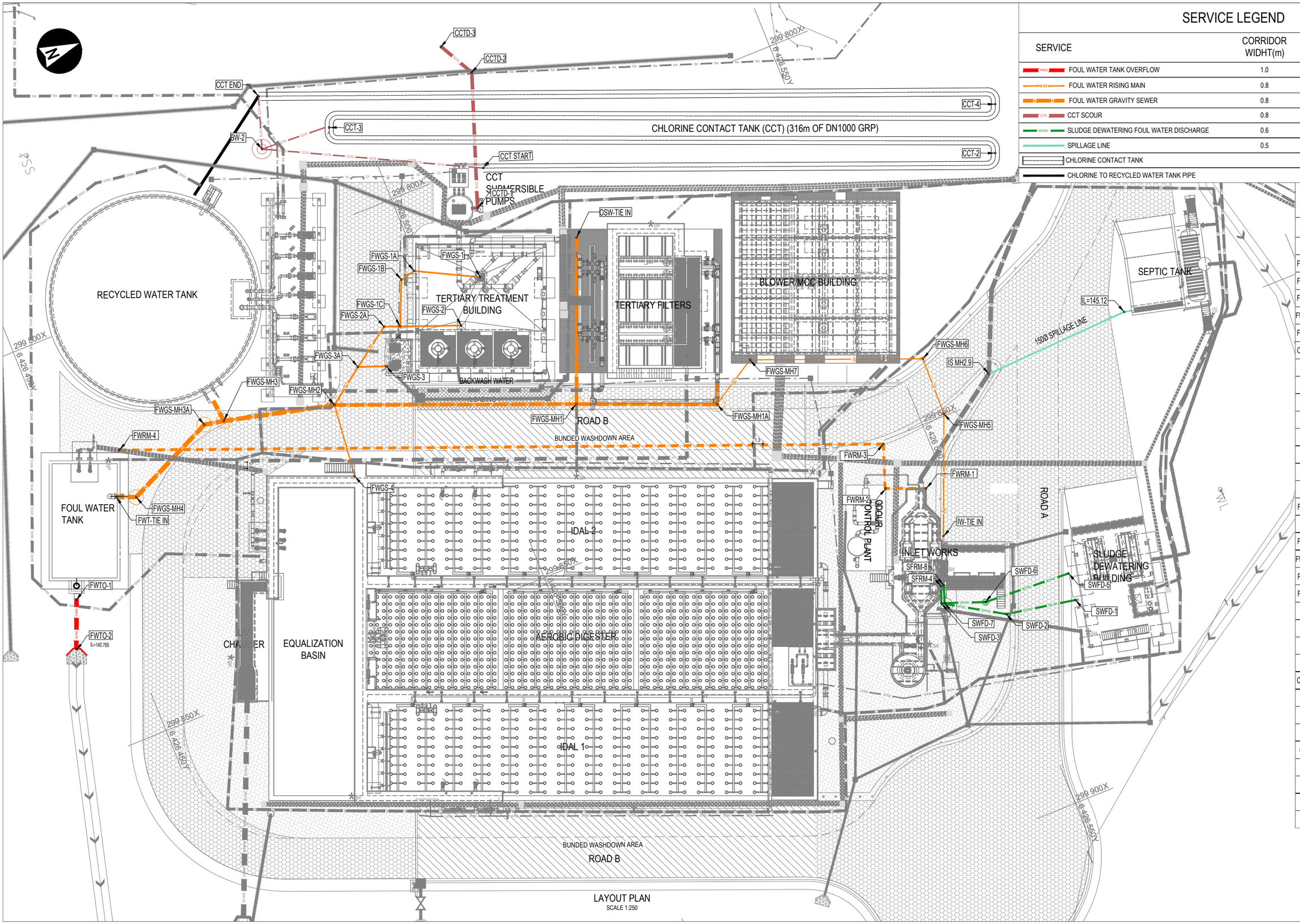
The Probable Cause of the Overflow:

Any Action Taken to Stop the Bypass Happening:

Any Actions Taken to Prevent the Bypass Happening Again:

OFFICE USE ONLY:

Call NSW Health 4924 6477 Yes No B
Call NSW EPA 131 555 Yes C No B
Call NSW DPE 0419 620 990 Yes C No D
Call Office of the General Manager 6549 3752 Yes C No CJ
Call MSC Environmental Health Officer 6549 3863 Yes i No D



LAYOUT PLAN
SCALE 1:250

SERVICE LEGEND

SERVICE	CORRIDOR WIDHT(m)	PIPE Ø (m) (ND)	TYPE
FOUL WATER TANK OVERFLOW	1.0	500	DI
FOUL WATER RISING MAIN	0.8	125	ABE (PVC)
FOUL WATER GRAVITY SEWER	0.8	100	ABE (PVC)
CCT SCOUR	0.8	375/110	ABE (PVC)
SLUDGE DEWATERING FOUL WATER DISCHARGE	0.6	200	PE
SPILLAGE LINE	0.5	150	PVC
CHLORINE CONTACT TANK		1000	GRP
CHLORINE TO RECYCLED WATER TANK PIPE		300	DI

COORDINATES

POINT	Y	X	INV
IW-TIE IN	6426547.2539	299863.6244	143.5
FWGS-MH5	6426552.9414	299849.7201	143.27
FWGS-MH6	6426553.0752	299842.5269	143.14
FWGS-MH7	6426533.3857	299834.7068	142.92
FWGS-MH1A	6426527.6066	299838.2562	142.27
FWGS-MH1	6426511.6373	299831.7619	141.92
OSW-TIE IN	6426519.2725	299812.8704	142.63
FWGS-1	6426506.5169	299812.9416	142.76
FWGS-1A	6426499.2965	299809.1793	
FWGS-1B	6426497.4437	299809.5932	
FWGS-1C	6426495.1611	299814.8462	
FWGS-2	6426502.1503	299817.5606	142.49
FWGS-2A	6426493.3198	299814.1311	
FWGS-3	6426490.821	299818.3549	
FWGS-3A	6426488.5057	299817.5095	
FWGS-MH2	6426484.1089	299820.7535	141.31
FWGS-4	6426483.1128	299829.8064	141.67
FWGS-MH3	6426470.7859	299817.4802	141.25
FWGS-MH3A	6426468.3935	299817.0118	141.23
FWGS-MH4	6426457.3187	299822.1081	141.03
FWT-TIE IN	6426455.0738	299821.152	141.00
FWRM-1	XXXXXXX	XXXXXXXX	
FWRM-2	6426542.83	299855.506	
FWRM-3	6426544.68	299850.39	
FWRM-4	6426457.557	299815.991	
CCT-START	6426511.88	299800.68	141.82
CCT-2	6426570.59	299822.40	142.36
CCT-3	6426496.0473	299789.4358	141.7
CCT-4	6426573.00	299816.94	142.19
CCT-END	6426490.0	299782.38	141.54
CCTS-MH	6426487.5939	299788.3559	
CCTD-1	6426509.3842	299804.9349	142.83
CCTD-2	6426514.9472	299789.2921	
CCTD-3	6426512.644	299784.946	142.69

CLIENT

muswellbrook shire council

aurecon
www.aurecongroup.com

REV	DATE	REVISION DETAILS	APPROVED
C0	01/02/17	APPROVED FOR CONSTRUCTION	G.UNIE
1	17/04/20	WORK AS EXECUTED	M.CLIFFORD

SCALE	SIZE
1:250	A1

DRAWN: S. CARTER
DESIGNED: R. BUCKLE
CHECKED: R.TUCKER

WORK AS EXECUTED

APPROVED
DATE

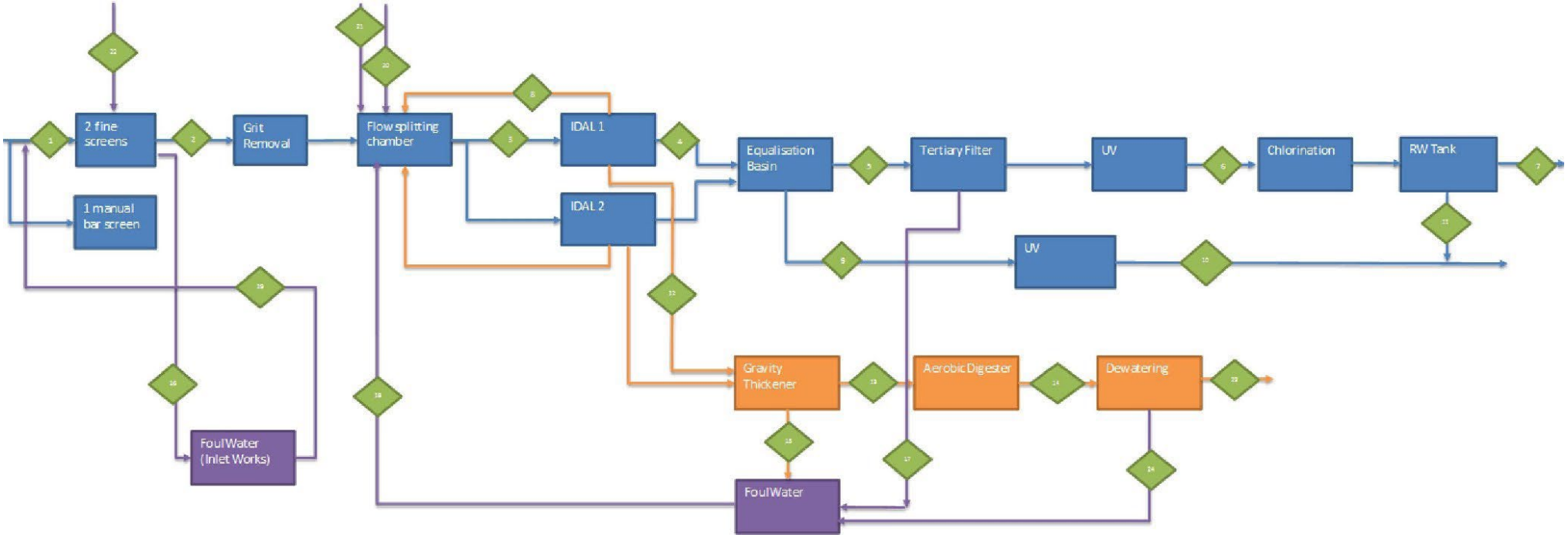
PROJECT: MUSWELLBROOK RECYCLE WATER TREATMENT WORKS MSC 2010-2011-0032 C2 - 60003

TITLE: FOUL WATER NETWORK PLAN

DRAWING No. 248656 – MS03 – DRG – CC – 8002 – 1

PROJECT No.	WBS	TYPE	DISC	NUMBER	REV
248656	MS03	DRG	CC	8002	1

13 Process Flow Diagram



14 Material Safety and Data Sheets

SAFETY DATA SHEET

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name:	**ALUMINIUM SULPHATE LIQUID**
Other Names:	Sulphate of Alumina, Alum, Papermakers Alum, Filter Alum, Liquid.
Manufacturers Product Code:	Liquid Aluminium Sulphate T.I.F
Recommended use of the chemical and restrictions on use:	Treatment of municipal water supplies, sewage and industrial effluents; paper manufacturing; tanning; chemical intermediate for other aluminium compounds; clarifying oils and fats; antiperspirants; pesticides; fireproofing and waterproofing cloths; waterproofing concrete; catalyst for oil refining.
Supplier: **ABN:** **Street Address:**	Omega Chemicals 32 982 143 022 / A.C.N 005 032 744 T/A 55 FITZGERALD ROAD, LAVERTON NORTH, VIC 3026
Telephone Number: **Facsimile:**	+61 3 8368 8000 +61 3 8368 8020
Emergency Telephone:	1300 131 001 (All Hours) Poisons Information Centre Australia: 131 126

2. HAZARD IDENTIFICATION

Hazard Classification:	Classified as Hazardous according to the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) and Safe Work Australia criteria. Classified as a Non-Dangerous Goods according to the ADG Code.
GHS Classification:	Eye Irritation – Category 2A Skin irritation – Category 2 Acute Toxicity (Oral) – Category 4
Signal Word (s):	Warning
Hazard Statement(s):	H319 Causes serious eye irritation.

H315 Causes skin irritation.
H302 Harmful if swallowed.

Precautionary Statement(s):

Prevention Statement(s): P102 Keep out of reach of children.
P103 Read label before use.
P234 Keep only in original container.
P264 Wash hands thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P390 Absorb spillage to prevent material damage.

Response Statement(s): P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P321 Specific treatment (see First Aid Measures on the Safety Data Sheet).
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before re-use.
P305+P354+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 If eye irritation persists: Get medical advice/attention.
P390 Absorb spillage to prevent material damage.

Storage Statement(s): No storage statements.

Disposal Statement(s): P501 Dispose of contents/container in accordance with jurisdictional regulations.

Poisons Schedule (SUSMP): N/A

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	CAS Number	Proportion:	Hazard Codes
Aluminium Sulphate	10043-01-3	47%	H319, H315, H302
Water	7732-18-5	Balance to 100%	

4. FIRST AID MEASURES

For advice, contact Poisons Information Centre on 131 126 or a Doctor.

Ingestion: Immediately rinse mouth with water. Give plenty of water to drink. **DO NOT** induce vomiting. If vomiting occurs give further water. Never give anything by mouth if victim is rapidly losing consciousness. **Seek immediate medical attention.**

Eyes: Immediately irrigate with copious quantities of water for at least 15 minutes. Eyelids to be held open. Remove clothing if contaminated and wash skin. **Seek medical assistance.**

Skin: Remove all contaminated clothing without delay. Wash skin gently and thoroughly with copious amounts of water. If irritation occurs, seek medical attention.

Inhalation: Remove the source of contamination or move the victim to fresh air; avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical attention.

Advice to Doctor: Treat symptomatically.

Additional Information

Aggravated medical conditions caused by exposure: Persons with pre-existing skin disorders may be more susceptible to the effects from this product.

5. FIRE FIGHTING MEASURES

Extinguishing Media: In case of fire, use an appropriate extinguishing media (water fog or if unavailable fine water spray, foam, carbon dioxide, dry chemical powder) that is the most suitable for surrounding fire conditions. Keep containers cool with water spray. If safe to do so, remove containers from path of fire. Suppress (knock-down) gases, vapours and mists with a water spray jet.

Hazchem Code: N/A.

Specific Hazards arising from the substance or mixture:

Hazards from Combustion: Product is non-flammable.

Flammability Conditions: Product is a non-flammable liquid.

Special Protective Precautions and Equipment for Fire Fighters: Fire fighters should wear a self-contained breathing apparatus and full protective clothing along with protective equipment. Prevent fire extinguishing water from contaminating surface water or the ground water system.

6. ACCIDENTAL RELEASE MEASURES

Emergency Procedures/Protective Equipment/Personal Precautions: Evacuate all unnecessary personnel. Work upwind. Increase ventilation. Use water spray to disperse vapours. Personnel involved in the clean-up should wear full protective clothing; self-contained breathing apparatus may be needed for prolonged periods of exposure. Avoid walking through spilled product as it may be slippery. Cover drains. Collect, bind and pump off spills.

Environmental Precautions: Do not allow product to enter drains, sewers, waterways or soil. If contamination of drains has occurred, advise the local emergency services.

Methods and Materials for Containment and Clean Up:	Contain spilled product using absorbent (soil or sand). Prevent run off into drains, sewers waterways or soil. Collect and seal in properly labelled drums ready for appropriate disposal. Dilute remaining product with water, neutralize with lime or soda ash and hold contaminated water for treatment. For large spills notify local emergency services.

7. HANDLING AND STORAGE

Precautions for Safe Handling:	Irritant liquid. Ensure an eye bath and safety shower are available and ready for use. Use only in a well-ventilated area. Prevent the build-up of mists in the work atmosphere. Avoid inhalation of mists, and skin or eye contact. Wear appropriate protective equipment to prevent inhalation, skin and eye contact when mixing and using. Ensure a high level of personal hygiene is maintained when using this product, that is, always wash hands before eating, drinking, smoking or using the toilet. Keep containers sealed when not in use.
Container Type:	Packaging must comply with requirements of Hazardous Substances (Packaging) Regulations 2001. Store in original packaging as approved by manufacturer. Store and transport in corrosion-resistant containers made of stainless steel, rubber-lined steel, PVC, fibreglass or polyethylene.
Conditions for Safe Storage, including any Incompatibles:	Store in a cool, dry, well-ventilated area out of direct sunlight. Do not store with incompatible products such as acids, sodium hydroxide and other alkalis. Do not store with any foodstuffs. In very dilute aqueous solutions, this product may hydrolyse to form some sulphuric acid. Strong aqueous solutions of aluminium sulphate will readily react with sodium hydroxide and other alkali to form a thick slippery paste or jell. Mildly corrosive to metals and concrete.

8. EXPOSURE CONTROLS

Control Parameters:

National Exposure Standards:	Aluminium Sulphate: No specific exposure standard. Aluminium soluble salts (as Aluminium): AU OEL: 2 mg/m^3.
Biological Limit Values:	No data available

Appropriate Engineering Controls:	Select suitable materials for the construction of storage tanks, containers, pipe valves and fittings. Ensure adequate ventilation using a combination of natural and local or general exhaust as appropriate. Keep containers closed when not in use in a well-ventilated area.
Individual Protection Measures, such as Personal Protective Equipment (PPE):	**Respirator:** Recommended: If engineering controls are not effective in controlling airborne exposure then an approved respirator with a replaceable mist filter should be used .

Eyes:	Chemical splash goggles or safety glasses with side shield
Hands:	Chemical resistant gloves of impervious material e.g. PVC or rubber gloves.
Clothing:	Chemical protective clothing. Recommended: Splash apron / overall. Chemical resistant Gum boots,

After using this product always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Core Information

Appearance:	Clear to straw coloured liquid.
Formula:	$Al_2(SO_4)_3 .14\ H_2O$
Odour:	Odourless.
pH:	2.0 – 2.7.
Vapour Pressure & density	No data available.
Boiling Point:	120°C.
Freezing Point:	-15°C.
Solubility (in Water):	Miscible.
Specific Gravity:	1.31 (at 20°C).
Flash Point:	N/A.
Flammability Limits (as Percent Volume in Air):	**Lower Explosive Limit** N/A. **Upper Explosive Limit** N/A.
Ignition Temperature:	No data available.

Additional Information

Specific Heat Value:	No data available.
Particle Size:	No data available.
Volatile Organic Compounds Content (VOC):	No data available.

Viscosity:	No data available.
Percent Volatile:	No data available.
Octanol/Water Partition Coefficient:	No data available.
Saturated Vapour Concentration:	No data available.
Additional Characteristics:	Insoluble in alcohol.
Flame Propagation/Burning Rate of Solid Materials:	No data available.
Properties that may Initiate or Contribute to the Intensity of a Fire:	No data available.
Potential for Dust Explosion:	N/A.
Reactions that Release Flammable Gases or Vapours:	No data available.
Fast or Intensely Burning Characteristics:	No data available.
Non-Flammables that Could Contribute Unusual Hazards to a Fire:	No data available.
Release of Invisible Flammable Vapours and Gases:	No data available.
Decomposition Temperature:	No data available.
Evaporation Rate:	No data available.

10. STABILITY AND REACTIVITY

Reactivity:	Reacts with alkali.
Chemical Stability:	Stable under normal conditions of storage and handling. In very dilute aqueous solutions, this product may hydrolyse to form some sulphuric acid.
Possibility of hazardous Reactions:	Strong aqueous solutions of aluminium sulphate will readily react with sodium hydroxide and other alkali to form a thick slippery paste or jell. Mildly corrosive to metals and concrete. Thermal decomposition will produce dilute sulphuric acid.
Conditions to Avoid:	Heat-sensitive, avoid exposure to extreme heat and high temperatures. Avoid sources of ignition.
Incompatible Materials:	Mildly corrosive to metals and concrete. Avoid contact with mild steel,

	acids, sodium hydroxide and other alkalis Keep away from all foodstuffs.
Hazardous Decomposition Products:	Hazardous decomposition products include sulphur dioxide (SO_2) and sulphur trioxide (SO_3) and dilute sulphuric acid.

11. TOXICOLOGICAL INFORMATION

Toxicity Data

LD50:	6207 mg/kg (mouse, oral, *as solid aluminium sulphate*).
LD50:	1930 mg/kg (rat, intrapertioneal, *as solid aluminium sulphate*).
Neurotoxicity:	Injection of aluminium salts directly into the brain of animals caused functional and structural damage.
Inhalation:	Prolonged inhalation of 2 to 4 mg/m^3 of aluminium sulphate caused scarring of upper lung tissue.

Acute (short term)

Ingestion:	May be harmful if swallowed. May cause abdominal pain, nausea, vomiting, diarrhoea, bleeding stomach, gastrointestinal irritation, incoordination, muscle spasm and kidney damage.
Eye:	Can cause moderate to severe irritation and inflammation to the eyes.
Skin:	Can cause irritation to open cuts and wounds.
Inhalation:	Breathing in mists or aerosols may cause sore throat and coughing, and irritation to the respiratory tract, nose and throat.

Chronic (long term)

Skin:	Repeated or prolonged exposure may numb of the fingers.
Ingestion:	Repeated ingestion of this product may cause phosphate deficiency which can weaken bones.

12. ECOLOGICAL INFORMATION

Ecotoxicity:	No data available.
Persistence and Degradability:	No data available.
Mobility:	No data available.

Additional Information

Environmental Fate (Exposure):	No data available.
Bio accumulative Potential:	No data available.
Other Adverse Effects:	Discharge into the environment must be avoided. Avoid contaminating waterways, drains and sewers.

13. DISPOSAL CONSIDERATIONS

Disposal Methods:	Dispose of in accordance with all local, state and federal regulations. Refer to appropriate State Waste Disposal Authority. Observe local regulations. After dilution and careful neutralisation, approved liquid waste land fill site may be suitable.
Special Precautions for Landfill or Incineration:	No data available.

14. TRANSPORT INFORMATION

UN Number:	None allocated.
UN Proper Shipping Name:	Aluminium Sulphate Liquid.
Dangerous Goods Class:	None allocated.
Subsidiary Risk:	None allocated.
Packaging Group:	None allocated.
Special Precautions for User:	Irritant.
Hazchem Code:	N/A.

15. REGULATORY INFORMATION

Poisons Schedule:	N/A.
EPG:	N/A.
AICS Name:	Sulphuric acid, aluminium salt (3:2).
Additional information:	No data available.

16. OTHER INFORMATION

Revision Details

Reason for Revision:

Version 1	5 year review. Updated to a new format. Additional information added.
Version 2	Alignment to GHS requirements.
Version 3	Reclassify according SafeWork Australia
Version 4	GHS 7th Edition.

Literature References

Chemical Rubber Company:	Handbook of Chemistry and Physics, 85th Edition.
Safe Work Australia:	Hazardous Substances Information System (HCIS) Exposure Standards and GHS Classifications Data-Base, 7th Edition.
National Transport Commission:	Australian Code for the Transport of Dangerous Goods by Road and Rail, Volume 7.

Abbreviations

CAS Number:	Chemical Abstract Service Registry Number.
GHS:	Globally Harmonized System of Classification and Labelling of Chemicals.
EPG:	Emergency Procedure Guide.
LD50:	Lethal Dose 50%: The lowest concentration at which approximately 50% of test animals will die when given the specified dose by mouth.
ADG Code:	Australian Code for the Transport of Dangerous Goods by Road and Rail, Volume 7.
AICS Name:	Australian Inventory of Chemical Substances Name.
OEL:	Occupational Exposure Level.
N/A:	Not Applicable.

Disclaimer

This Safety Data Sheet is offered solely for information, consideration and investigation to determine the suitability of various health and safety precautions as may be required under the user's specific conditions and processes. All such conditions and processes are beyond the control of Omega Chemicals.

The information contained herein is based on data available to Omega Chemicals from both our own technical sources and recognised published references and is believed to be both accurate and reliable. Omega Chemicals however provides no warranties, either expressed or implied, and assumes no responsibility for the accuracy or completeness of this information.

Omega Chemicals reserves the right to revise this Safety Data Sheet as information becomes available. The user has the responsibility, by making contact with this company or otherwise to make certain the Safety Data Sheet is the latest issue.

DOCUMENT END

1. IDENTIFICATION

Product Name	**Sodium Hypochlorite Solution 10-30%**
Other Names	Clorox; HypochloriteSolution; Hypochlorous acid-sodium salt
Uses	Dairy, food and beverage industries: Sanitising processing equipment. Textile industry: Bleaching agent. Water treatment: Sanitising agent. Available chlorine = 10 - 15%.
Chemical Family	No Data Available
Chemical Formula	NaOCl
Chemical Name	Sodium Hypochlorite Solution 10-30%
Product Description	No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
	Colonial Chemicals Australia Pty. Ltd. Skewes Road, BENDEMEER. NSW. 2355. Postal Address: P.O. Box 167, Moonbi, NSW, 2355	Office: 02 6769 6658 Mobile: 0437 696658 Email: sales@colonialchemicals.com.au

Emergency Contact Details

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

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

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust) 6

Globally Harmonised System

Hazard Classification		Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)	
Hazard Categories		Skin Corrosion/Irritation - Category 1B Serious Eye Damage/Irritation - Category 1 Specific Target Organ Toxicity (Single Exposure) - Category 3 Acute Hazard To The Aquatic Environment - Category 1	
Pictograms			
Signal Word		Danger	
Hazard Statements		**EUH031**	Contact with acids liberates toxic gas.
		H314	Causes severe skin burns and eye damage.
		H400	Very toxic to aquatic life.
Precautionary Statements	Prevention	**P260**	Do not breathe fume/gas/mist/vapours/spray.
		P273	Avoid release to the environment.
		P280	Wear protective gloves/protective clothing/eye protection.
	Response	**P301 + P330 + P331**	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
		P303 + P361 + P353	IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.
		P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
		P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
		P310	Immediately call a POISON CENTER or doctor/physician.
		P321	Specific treatment (see First Aid Measures on Safety Data Sheet).
		P363	Wash contaminated clothing before reuse.
		P391	Collect spillage.
	Storage	**P405**	Store locked up.
	Disposal	**P501**	Dispose of contents/container in accordance with local / regional / national / international regulations.

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

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

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Sodium Hypochlorite	ClHO.Na	7681-52-9	10.5 - 15.6 %
Sodium Hydroxide	HNaO	1310-73-2	0.7 - 2.0 %
Water	H2O	7732-18-5	Balance %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed	Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of water. Get medical aid immediately.
Eye	Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids. Get medical aid immediately.
Skin	Get medical aid immediately. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Discard contaminated clothing in a manner, which limits further exposure.
Inhaled	Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. DO NOT use mouth-to-mouth respiration.
Advice to Doctor	Symptoms caused by exposure: Chlorine gas released from sodium hypochlorite causes irritation of respiratory system, consisting in coughing, difficult breathing, stomatitis, nausea and pulmonary edema. Contact with skin can cause skin irritation, followed by blisters and eczema (especially at 12% concentration). The eye contact causes serious damages of eyes. Ingestion of tens of grams of sodium hypochlorite solution (12% concentration) can cause mucous membrane burns, perforation of the esophagus and stomach, and laryngeal oedema. Medical Attention and Special Treatment: In case of eyes and face splashing , treat eyes firstly. Treat symptomatically and supportively.
Medical Conditions Aggravated by Exposure	No information available on medical conditions aggravated by exposure to this product.

5. FIRE FIGHTING MEASURES

General Measures	If safe to do so, remove containers from the path of fire.
Flammability Conditions	Not considered to be a fire hazard. Sodium hypochlorite itself does not burn, but poisonous gases are produced in fire.
Extinguishing Media	Suitable Extinguishing Media: Water. Use water spray to cool fire-exposed containers, to dilute liquid, and control vapour.
Fire and Explosion Hazard	Contact with combustible materials can cause explosions. Hazchem Code: 2X
Hazardous Products of Combustion	Emits toxic fumes of chlorine (hypochlorous acid and sodium chlorate) when heated to decomposition. The decomposition is an exothermal process.
Special Fire Fighting Instructions	Keep containers cool with water spray. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self- contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products. Containers may explode when heated.
Personal Protective Equipment	Fire fighters should wear a positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots and gloves) or chemical splash suit. Please note: Structural fire fighters uniform will provide limited protection.
Flash Point	No Data Available
Lower Explosion Limit	No Data Available
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	2X

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Emergency procedures, Evacuate the danger area or to consult an expert. Approach from upwind. Isolate the area. Wear self-contained breathing apparatus in confined spaces, in cases where the oxygen level is depleted, or in case of significant emissions. Prevent further leakage or spillage if safe to do so. Keep away from incompatible products.
Clean Up Procedures	Spills/Leaks: The spills can be neutralized using light reducing agents such as sodium sulphite sodium bisulphite or sodium thiosulphate. Do not use sulphates or bi-sulphate! Contain and recover when is possible. Stop leak if safe to do so.

Containment	
Decontamination	Special precautions: Do not use combustible materials, such as saw dust! Do not use sulphates or bisulphates for spill neutralizing!
Environmental Precautionary Measures	Do not allow product to reach drains, sewers or waterways. If product does enter a waterway, advise the Environmental Protection Authority or your local Waste Authority.
Evacuation Criteria	Evacuate all unnecessary personnel.
Personal Precautionary Measures	Personnel involved in the clean up should wear full protective clothing as listed in section 8.

7. HANDLING AND STORAGE

Handling	Protect against physical damage. Personnel which handling the product must wear protective equipment for hand, skin or eyes, and including protective breathing apparatus. Area should be well ventilated. Advice on general occupational hygiene: Avoid inhalation or ingestion and contact with skin and eyes. General occupational hygiene measures are required to ensure safe handling of the substance. Chemicals should be used only by those trained in handling potentially hazardous materials. The electrical equipment should be corrosion resistant.
Storage	Keep in tightly closed containers, store in a cool, dry, well ventilated area. Isolate from incompatible substances. The aqueous solutions are sensitive to light and air. Avoid storage for long period because the product degrades over time. The recommended storing temperature is 15-25 C. Storage at 15 C reduces the rate of decomposition. This product has a UN classification of 1791 and a Dangerous Goods Class 8 (Corrosive) according to The Australian Code for the Transport of Dangerous goods By Road and Rail.
Container	Materials used for storage tanks: • polyethylene; 5-7 years life time. The outdoor tanks will be UV proof. • glass fibre reinforced plastics – designed accordingly • steel rubber-lined (thickness of lining - ¾") • steel Halar lined (Halar is a copolymer 1:1 ethylene- chlorotrifluoroetylene) ; 3-6 years life time function of quality of lining application. • titanium – the best material used for tank construction but because the high price is used only for specific applications. Incompatible materials: reducing agents, combustible materials (wood, cellulose), organic materials, metals, acids. Materials to avoid: carbon steel, stainless steel, copper and its alloys, aluminium, unprotected metals.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	HSIS Airborne Exposure Limits: Chlorine: TWA 1 ppm (3 mg/m3 peak limitation) NOTE: The exposure value at the TWA is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. Peak limitation is a ceiling concentration which should not be exceeded over a measurement period which should be as short as possible but not exceeding 15 minutes. These exposure standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.
Exposure Limits	No Data Available
Biological Limits	No information available on biological limit values for this product.
Engineering Measures	These exposure standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.
Personal Protection Equipment	RESPIRATOR: Self-contained breathing apparatus with full face-piece operated in the pressure demand. For emergencies or instances where exposure levels are not known, use a full face piece positive pressure, air supplied respirator. Warning! Air -purifying respirators do not protect workers in oxygen deficient atmospheres (AS1715/1716). EYES: Chemical splash goggles and/or face shield must be worn when possibility exist for eye contact due to splashing or spraying liquid or vapor (AS1336/1337). HANDS: Wear PVC, rubber or neoprene gloves. Glove thickness has to be of minimum 1.2 mm. Do not use leather gloves (AS2161). CLOTHING: Wear impervious protective clothing including boots, lab coat, apron or coveralls and safety footwear (AS3765/2210).
Work Hygienic Practices	Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.x

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid
Appearance	Liquid
Odour	Chlorine odour
Colour	Clear, colourless
pH	>12
Vapour Pressure	2500 Pa Pa (@ 20 °C)
Relative Vapour Density	No Data Available
Boiling Point	100 approx °C
Melting Point	No Data Available
Freezing Point	No Data Available
Solubility	Miscible in water
Specific Gravity	1.09 for 5.25% - 1.21 for 12.0%
Flash Point	No Data Available
Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	No Data Available
Density	No Data Available
Specific Heat	No Data Available
Molecular Weight	No Data Available
Net Propellant Weight	No Data Available
Octanol Water Coefficient	-3.42 (calculated value)
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	2.6 mPas (@ 20 °C)
Volatile Percent	No Data Available
VOC Volume	No Data Available
Additional Characteristics	Specific density (water=1) 1.09 for 5.25%; 1.15 for 8.0%; 1.21for 12.0% Sodium hypochlorite solution is an aqueous mix of inorganic salts; therefore by heating of solution, water evaporates. At temperatures above 60C, the water evaporates with depositing of white crystals on the bottom of tank .For this reason the boiling point can not be determined
Potential for Dust Explosion	Product is a liquid.
Fast or Intensely Burning Characteristics	No Data Available
Flame Propagation or Burning Rate of Solid Materials	No Data Available
Non-Flammables That Could Contribute Unusual Hazards to a Fire	No Data Available
Properties That May Initiate or Contribute to Fire Intensity	No Data Available
Reactions That Release Gases or Vapours	No Data Available
Release of Invisible Flammable Vapours and Gases	No Data Available

10. STABILITY AND REACTIVITY

General Information	Reactivity: Reacts violently with acids with chlorine released. Possibility of Hazardous Reactions: Sodium hypochlorite is extremely corrosive for aluminium, brass. Reacts with metals (nickel, cooper, tin) with oxygen release, with ammonia urea, oxidisable substances, ammonium nitrate, ammonium oxalate, ammonium phosphate , ammonium acetate , ammonium carbonate , cellulose and methanol.
Chemical Stability	Unstable. Stability decreases with concentration, heat, light exposure, decrease in pH and contamination with heavy metals, such as nickel, cobalt, copper and iron. In practice, a factor of 2 decrease in concentration produces nearly a factor of 5 decrease in decomposition rate at any given temperature with a pH range of approximately 11 to 13. At pH<11, sodium hypochlorite is unstable and decomposes with the release of chlorine.
Conditions to Avoid	Light, heat and incompatibles.
Materials to Avoid	Incompatible materials and possible hazardous reactions: aluminum, brass, cellulose, steel, stainless steel, bronzes. Strong acids, strong oxidizers, heavy metals (which act as catalysts), reducing agents, ammonia and ammonium salts, ether, and many organic and inorganic chemicals such as paint, kerosene, paint thinners, shellac.
Hazardous Decomposition Products	Emits toxic fumes of chlorine (hypochlorous acid and sodium chlorate) when heated to decomposition. The decomposition is an exothermal process.
Hazardous Polymerisation	Sodium hypochlorite is extremely corrosive for aluminium, brass. Reacts with metals (nickel, cooper, tin) with oxygen release, with ammonia, urea, oxidisable substances, ammonium nitrate, ammonium oxalate, ammonium phosphate ,ammonium acetate , ammonium carbonate , cellulose and methanol.

11. TOXICOLOGICAL INFORMATION

General Information	Acute toxicity: Sodium Hypochlorite: Rat male Oral LD50 = 1100 mg/kg bw (for sodium hypochlorite sol.. 12% free chlorine). Mouse male Oral LD50, = 880 mg/kg bw (for sodium hypochlorite sol.. 12% free chlorine). Other routes : intra-peritoneal Rat LD 50, (1h) > 10,7 mg/L air, causes abundant tearing. Rabbit male/female LD50, >20 g/kg bw. Causes serious skin irritation. Mouse LD= 240-250mg/kg bw, Guinea pig LD: 63 mg/kg bw. Repeated dose toxicity: Oral NOAEL: 50 mg/kg bw/day Respiratory or skin sensitisation: Not sensitising Germ cell mutagenicity: No genetic toxicity effects Carcinogenicity: No carcinogenic potential Reproductive toxicity: Sodium hypochloritel has no genotoxic potential, therefore no classification is required according to 67/548/EEC and 1272/2008/EC (CLP) requirements. Information on Possible routes of exposure: Ingestion, Inhalation, Skin/ eye exposure. Interactive Effects: Sodium hypochlorite reacts rapidly with the organic molecules and cellular components, forming organic chlorinated compounds which have their own toxicity (BIBRA 1990)
EyeIrritant	Causes eye damage. Eye damage, category 1. Eye contact causes serious burns and discomfort.
Ingestion	Causes severe pain, nausea, vomiting, diarrhoea, and shock. May cause haemorrhaging of the digestive tract. May cause corrosion and permanent tissue destruction of the oesophagus and digestive tract. May be harmful if swallowed.
Inhalation	Irritant. Inhalation of sprayed solution and vapours can cause respiratory system irritation caught, difficulty of breathing, stomatitis, nausea and pulmonary edema. Classified as STOT Single Exposure 3.
SkinIrritant	Light irritant at low concentrations. Moderate irritant at medium concentrations (>5%). Corrosive at concentration higher than 10%. Skin corrosive category 1B.
Chronic	
Other	Prolonged inhalation may cause respiratory tract inflammation and lung damage. Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated eye contact may cause conjunctivitis to serious eye damage.
Carcinogen Category	No Data Available

12. ECOLOGICAL INFORMATION

Ecotoxicity	Aquatic Toxicity Tests demonstrate NOEC (7 days)= 0,0021 mg/L. Factor M=10. Short-term toxicity to invertebrates (molluscs, Daphnia magna, Ceriodaphnia dubia) - Fresh water: EC50/LC50 =0,141 mg/L - Marine water: EC50/LC50 =0.026 mg/L Long-term toxicity to invertebrates - Marine water: LC100 (36days) 0,005mg/L

	- NOEC for aquatic invertebrates = 0.007 mg/L Short-term toxicity to fish - Fresh water LC 50 =0,06 mg/l - Marine water LC 50= 0.032 mg/l Long-term toxicity to fish - Marine water: NOEC= 0,04 mg CPO/L Short-term toxicity to algae and aquatic plants: Not applicable , sodium hypochlorite decomposes rapidly . Long-term toxicity to algae and aquatic plants - Fresh water EC50/LC50=0,1 mg/l - Marine water EC10/LC10 or NOEC =0,02 mg/L PNEC (Predicted No Effect Concentration) PNEC fresh water = Minimum long-term aquatic toxicity/10 = 0.21 µg/L PNEC marine water = Minimum long-term aquatic toxicity /50 = 0.042 µg/L Toxicity to sediment micro-organisms There are not predicted exposures due the fact that sodium hypochlorite is destroyed quickly by oxy-reduction. Sodium hypochlorite can not exist in presence of organic carbon. PNEC=0 fresh water sediment / marine water sediment. Terrestrial toxicity Short/long -term toxicity to terrestrial invertebrates Substance is not absorbed in soil and is not persistent in soil. TD50<1 min, PEC/PNEC soil<1. Toxicity to soil micro-organisms Short/long term toxicity to plants Due the fact that PEC/PNEC for terrestrial toxicity is <1 and at contact with soil hypochlorite dissipates quickly (TD50 <1 min) there is not estimated short/long toxicity to plants. In accordance with column 2 of REACH Annexes IX and X, there is no need to further investigate the effects of the substance on plants. Long-term toxicity to birds EC10/LC10 or NOEC on long term : 200 mg/kg food
Persistence/Degradability	Biotic: The inorganic water can not be tested for biodegradability. Abiotic: Hypochlorite degrades quickly during the transport through sewage system. Photo-transforming (Photolysis) Atmospheric degradation: At medium pH (6, 5-8, 5) value, half of sodium hypochlorite is present as hypochlorous acid and the other half is dissociate as hypochlorite ions. In the atmosphere, hypochlorous acid degrades, generating atomic chlorine, which is destroyed by UV radiation. The half ??life is115 days. Does not react with ozone layer. Photolysis in water Half-life for sodium hypochlorite solution, active chlorine 12-15%, at 250C is 220 days. In presence of light, the halflife decreases 3-4 times. The UV radiation decomposes the hypochlorite, generating chlorate, chlorite and oxygen: 3 ClO- => ClO3- + 2 Cl- (1) 2 ClO- => 2 Cl- + O2 (2) In water, under photolysis, sodium hypochlorite with concentration of13-18 mg/L, has a half-life of 12 min. at pH =8 . This increases up to 60 min. with pH decreasing
Mobility	At medium pH (6,5-8,5) value, half of sodium hypochlorite is present as hypochlorous acid and the other half is dissociate as hypochlorite ions. The absorption of hypochlorous acid particles, the air volatilization and soil absorption are very low. Thus, hypochlorite remains in aqueous phase and degrades to chlorine.
Environmental Fate	Do NOT let product reach waterways, drains and sewers.
Bioaccumulation Potential	Hypochlorite reacts instantaneously with organic and oxidant materials. Has not potential for bioaccumulation. PBT/vPvB: Hypochlorite does not fulfil the PBT criteria (not PBT) and not the vPvB criteria (not vPvB).
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of in accordance with all local, state and federal regulations. All empty packaging should be disposed of in accordance with Local, State, and Federal Regulations or recycled/reconditioned at an approved facility. Waste packaging should be recycled. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.
Special Precautions for Land Fill	Contact a specialist disposal company or the local waste regulator for advice. Incineration or landfill should only be considered when recycling is not feasible.

14. TRANSPORT INFORMATION

Land Transport (Australia)
ADG Code

Proper Shipping Name	HYPOCHLORITE SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	1791
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Land Transport (Malaysia)
ADR

Proper Shipping Name	HYPOCHLORITE SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	1791
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Land Transport (New Zealand)
NZS5433

Proper Shipping Name	HYPOCHLORITE SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	1791
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Land Transport (United States of America)
US DOT

Proper Shipping Name	HYPOCHLORITE SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
ERG	154 Substances - Toxic and/or Corrosive (Non-Combustible)
UN Number	1791
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Sea Transport
IMDG Code

Proper Shipping Name	HYPOCHLORITE SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available

UN Number	1791
Hazchem	2X
Pack Group	III
Special Provision	No Data Available
EMS	FA,SB
Marine Pollutant	Yes

Air Transport
IATA DGR

Proper Shipping Name	HYPOCHLORITE SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	1791
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

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

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

15. REGULATORY INFORMATION

General Information	No Data Available
Poisons Schedule (Aust)	6

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

Approval Code	Not Assessed

National/Regional Inventories

Australia (AICS)	Listed
Canada (DSL)	Not Determined
Canada (NDSL)	Not Determined
China (IECSC)	Not Determined
Europe (EINECS)	231-668-3
Europe (REACh)	Not Determined
Japan (ENCS/METI)	Not Determined
Korea (KECI)	Not Determined
Malaysia (EHS Register)	Not Determined

New Zealand (NZIoC)	Listed
Philippines (PICCS)	Not Determined
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined
Taiwan (NCSR)	Not Determined
USA (TSCA)	Not Determined

16. OTHER INFORMATION

Related Product Codes	SOHYCB1000, SOHYCB1001, SOHYCB2000, SOHYCC1000, SOHYCC2000, SOHYCC3000, SOHYCC3001, SOHYCC3300, SOHYCC7000, SOHYCC7100, SOHYCC9000, SOHYCC9500, SOHYCL0837, SOHYCL1000, SOHYCL1001, SOHYCL1002, SOHYCL1003, SOHYCL1004, SOHYCL1005, SOHYCL1006, SOHYCL1007, SOHYCL1008, SOHYCL1009, SOHYCL1010, SOHYCL1011, SOHYCL1012, SOHYCL1013, SOHYCL1014, SOHYCL1100, SOHYCL1200, SOHYCL1210, SOHYCL1300, SOHYCL1400, SOHYCL1500, SOHYCL1600, SOHYCL1700, SOHYCL1800, SOHYCL1801, SOHYCL1802, SOHYCL1803, SOHYCL1804, SOHYCL1805, SOHYCL1806, SOHYCL1807, SOHYCL1808, SOHYCL1809, SOHYCL1810, SOHYCL1811, SOHYCL1812, SOHYCL1813, SOHYCL1814, SOHYCL1815, SOHYCL1816, SOHYCL1817, SOHYCL1818, SOHYCL1819, SOHYCL1820, SOHYCL1821, SOHYCL1822, SOHYCL1823, SOHYCL1824, SOHYCL1825, SOHYCL1826, SOHYCL1827, SOHYCL1828, SOHYCL1829, SOHYCL1830, SOHYCL1831, SOHYCL1832, SOHYCL1833, SOHYCL1834, SOHYCL1835, SOHYCL1836, SOHYCL1837, SOHYCL1838, SOHYCL1839, SOHYCL1840, SOHYCL1841, SOHYCL1842, SOHYCL1843, SOHYCL1844, SOHYCL1845, SOHYCL1846, SOHYCL1847, SOHYCL1848, SOHYCL1849, SOHYCL1850, SOHYCL1851, SOHYCL1852, SOHYCL1853, SOHYCL1854, SOHYCL1855, SOHYCL1856, SOHYCL1857, SOHYCL1858, SOHYCL1859, SOHYCL1860, SOHYCL1861, SOHYCL1862, SOHYCL1863, SOHYCL1864, SOHYCL1865, SOHYCL1866, SOHYCL1867, SOHYCL1868, SOHYCL1869, SOHYCL1870, SOHYCL1871, SOHYCL1872, SOHYCL1873, SOHYCL1874, SOHYCL1875, SOHYCL1876, SOHYCL1877, SOHYCL1878, SOHYCL1879, SOHYCL1880, SOHYCL1881, SOHYCL1882, SOHYCL1883, SOHYCL1884, SOHYCL1885, SOHYCL1886, SOHYCL1887, SOHYCL1888, SOHYCL1889, SOHYCL1890, SOHYCL1900, SOHYCL1912, SOHYCL1932, SOHYCL1938, SOHYCL1939, SOHYCL2000, SOHYCL2012, SOHYCL2015, SOHYCL2100, SOHYCL2150, SOHYCL2200, SOHYCL2300, SOHYCL2400, SOHYCL2500, SOHYCL2600, SOHYCL2700, SOHYCL2813, SOHYCL2913, SOHYCL3000, SOHYCL3200, SOHYCL3500, SOHYCL3600, SOHYCL3601, SOHYCL3700, SOHYCL3800, SOHYCL3801, SOHYCL4000, SOHYCL4100, SOHYCL4201, SOHYCL4400, SOHYCL5000, SOHYCL6000, SOHYCL7000, SOHYCL7100, SOHYCL7200, SOHYCL7500, SOHYCL8000, SOHYCL8100, SOHYCL9000, SOHYCL9100, SOHYCL9500
Revision	4
Revision Date	27/08/2020
Reason for Issue	SDS Updated
Key/Legend	**<** Less Than **>** Greater Than **AICS** Australian Inventory of Chemical Substances **atm** Atmosphere **CAS** Chemical Abstracts Service (Registry Number) **cm²** Square Centimetres **CO2** Carbon Dioxide **COD** Chemical Oxygen Demand **deg C (°C)** Degrees Celcius **EPA (New Zealand)** Environmental Protection Authority of New Zealand **deg F (°F)** Degrees Farenheit **g** Grams **g/cm³** Grams per Cubic Centimetre **g/l** Grams per Litre **HSNO** Hazardous Substance and New Organism **IDLH** Immediately Dangerous to Life and Health **immiscible** Liquids are insoluable in each other. **inHg** Inch of Mercury **inH2O** Inch of Water **K** Kelvin **kg** Kilogram **kg/m³** Kilograms per Cubic Metre **lb** Pound **LC50** LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of

50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.
LD50 LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.
ltr or **L** Litre
m³ Cubic Metre
mbar Millibar
mg Milligram
mg/24H Milligrams per 24 Hours
mg/kg Milligrams per Kilogram
mg/m³ Milligrams per Cubic Metre
Misc or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present.
mm Millimetre
mmH2O Millimetres of Water
mPa.s Millipascals per Second
N/A Not Applicable
NIOSH National Institute for Occupational Safety and Health
NOHSC National Occupational Heath and Safety Commission
OECD Organisation for Economic Co-operation and Development
Oz Ounce
PEL Permissible Exposure Limit
Pa Pascal
ppb Parts per Billion
ppm Parts per Million
ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average
ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight

Caustic Soda 30%

Nowchem

Version No: **2.7**
Safety Data Sheet according to WHS and ADG requirements

Chemwatch Hazard Alert Code: **4**

Issue Date: **14/06/2016**
Print Date: **24/10/2018**
L.GHS.AUS.EN

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

Product name	Caustic Soda 30%
Synonyms	Not Available
Proper shipping name	SODIUM HYDROXIDE SOLUTION
Other means of identification	Not Available

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Liquid Caustic Soda solution for various cleaning and water treatment applications.

Details of the supplier of the safety data sheet

Registered company name	**Nowchem**
Address	112A Albatross Road NSW Australia
Telephone	(02) 4421 4099
Fax	(02) 4421 4932
Website	www.nowchem.com.au
Email	sales@nowchem.com.au

Emergency telephone number

Association / Organisation	**Nowchem**
Emergency telephone numbers	(02) 4421 4099
Other emergency telephone numbers	0413 809 255

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.

CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability	0	
Toxicity	0	
Body Contact	4	
Reactivity	0	
Chronic	0	

0 = Minimum
1 = Low
2 = Moderate
3 = High
4 = Extreme

Poisons Schedule	6
Classification [1]	Metal Corrosion Category 1, Skin Corrosion/Irritation Category 1A, Serious Eye Damage Category 1, Specific target organ toxicity - single exposure Category 3 (respiratory tract irritation)
Legend:	*1. Classified by Chemwatch; 2. Classification drawn from HSIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI*

Label elements

Continued...

Hazard pictogram(s)	
SIGNAL WORD	**DANGER**

Hazard statement(s)

H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H335	May cause respiratory irritation.

Precautionary statement(s) General

P101	If medical advice is needed, have product container or label at hand.
P102	Keep out of reach of children.
P103	Read label before use.

Precautionary statement(s) Prevention

P101	If medical advice is needed, have product container or label at hand.
P102	Keep out of reach of children.
P103	Read label before use.
P260	Do not breathe mist/vapours/spray.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P234	Keep only in original container.

Precautionary statement(s) Response

P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor/physician.
P363	Wash contaminated clothing before reuse.
P390	Absorb spillage to prevent material damage.
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

Precautionary statement(s) Storage

P405	Store locked up.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

Precautionary statement(s) Disposal

P501	Dispose of contents/container in accordance with local regulations.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
1310-73-2	30	sodium hydroxide

SECTION 4 FIRST AID MEASURES

Description of first aid measures

Eye Contact	If this product comes in contact with the eyes: ▸ Immediately hold eyelids apart and flush the eye continuously with running water. ▸ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. ▸ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. ▸ Transport to hospital or doctor without delay. ▸ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	If skin or hair contact occurs: ▸ Immediately flush body and clothes with large amounts of water, using safety shower if available. ▸ Quickly remove all contaminated clothing, including footwear.

Continued...

	▸ Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre. ▸ Transport to hospital, or doctor.
Inhalation	▸ If fumes or combustion products are inhaled remove from contaminated area. ▸ Lay patient down. Keep warm and rested. ▸ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. ▸ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. ▸ Transport to hospital, or doctor, without delay. ▸ Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema. ▸ Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).
Ingestion	▸ For advice, contact a Poisons Information Centre or a doctor at once. ▸ Urgent hospital treatment is likely to be needed. ▸ If swallowed do **NOT** induce vomiting. ▸ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. ▸ Observe the patient carefully. ▸ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. ▸ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink. ▸ Transport to hospital or doctor without delay.

Indication of any immediate medical attention and special treatment needed

For acute or short-term repeated exposures to highly alkaline materials:
- Respiratory stress is uncommon but present occasionally because of soft tissue edema.
- Unless endotracheal intubation can be accomplished under direct vision, cricothyroidotomy or tracheotomy may be necessary.
- Oxygen is given as indicated.
- The presence of shock suggests perforation and mandates an intravenous line and fluid administration.
- Damage due to alkaline corrosives occurs by liquefaction necrosis whereby the saponification of fats and solubilisation of proteins allow deep penetration into the tissue.

Alkalis continue to cause damage after exposure.
INGESTION:
- Milk and water are the preferred diluents

No more than 2 glasses of water should be given to an adult.
- Neutralising agents should never be given since exothermic heat reaction may compound injury.

* Catharsis and emesis are absolutely contra-indicated.
* Activated charcoal does not absorb alkali.
* Gastric lavage should not be used.

Supportive care involves the following:
- Withhold oral feedings initially.
- If endoscopy confirms transmucosal injury start steroids only within the first 48 hours.
- Carefully evaluate the amount of tissue necrosis before assessing the need for surgical intervention.
- Patients should be instructed to seek medical attention whenever they develop difficulty in swallowing (dysphagia).

SKIN AND EYE:
- Injury should be irrigated for 20-30 minutes.

Eye injuries require saline. [Ellenhorn & Barceloux: Medical Toxicology]

SECTION 5 FIREFIGHTING MEASURES

Extinguishing media

- There is no restriction on the type of extinguisher which may be used.
- Use extinguishing media suitable for surrounding area.

Special hazards arising from the substrate or mixture

Fire Incompatibility	None known.

Advice for firefighters

Fire Fighting	
Fire/Explosion Hazard	▸ Non combustible. ▸ Not considered a significant fire risk, however containers may burn. May emit corrosive fumes.
HAZCHEM	2R

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	▸ Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material. ▸ Check regularly for spills and leaks. ▸ Clean up all spills immediately. ▸ Avoid breathing vapours and contact with skin and eyes. ▸ Control personal contact with the substance, by using protective equipment. ▸ Contain and absorb spill with sand, earth, inert material or vermiculite. ▸ Wipe up. ▸ Place in a suitable, labelled container for waste disposal.

Continued...

Major Spills

Chemical Class: bases
For release onto land: recommended sorbents listed in order of priority.

SORBENT TYPE	RANK	APPLICATION	COLLECTION	LIMITATIONS
LAND SPILL - SMALL				
cross-linked polymer - particulate	1	shovel	shovel	R,W,SS
cross-linked polymer - pillow	1	throw	pitchfork	R, DGC, RT
sorbent clay - particulate	2	shovel	shovel	R, I, P
foamed glass - pillow	2	throw	pitchfork	R, P, DGC, RT
expanded minerals - particulate	3	shovel	shovel	R, I, W, P, DGC
foamed glass - particulate	4	shovel	shovel	R, W, P, DGC,
LAND SPILL - MEDIUM				
cross-linked polymer -particulate	1	blower	skiploader	R,W, SS
sorbent clay - particulate	2	blower	skiploader	R, I, P
expanded mineral - particulate	3	blower	skiploader	R, I,W, P, DGC
cross-linked polymer - pillow	3	throw	skiploader	R, DGC, RT
foamed glass - particulate	4	blower	skiploader	R, W, P, DGC
foamed glass - pillow	4	throw	skiploader	R, P, DGC., RT

Legend
DGC: Not effective where ground cover is dense
R; Not reusable
I: Not incinerable
P: Effectiveness reduced when rainy
RT:Not effective where terrain is rugged
SS: Not for use within environmentally sensitive sites
W: Effectiveness reduced when windy
Reference: Sorbents for Liquid Hazardous Substance Cleanup and Control;
R.W Melvold et al: Pollution Technology Review No. 150: Noyes Data Corporation 1988

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

Safe handling

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- **WARNING:** To avoid violent reaction, **ALWAYS** add material to water and **NEVER** water to material.
- Avoid smoking, naked lights or ignition sources.
- Avoid contact with incompatible materials.
- When handling, **DO NOT** eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately. Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer's storage and handling recommendations contained within this SDS.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

Other information

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storage and handling recommendations contained within this SDS.
- **DO NOT** store near acids, or oxidising agents
- No smoking, naked lights, heat or ignition sources.

Conditions for safe storage, including any incompatibilities

Suitable container

- Plastic pail.
- Packing as recommended by manufacturer (HDPE).
- Check all containers are clearly labelled and free from leaks.

For low viscosity materials

- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

Where combination packages are used, and the inner packages are of glass, porcelain or stoneware, there must be sufficient inert cushioning material in contact with inner and outer packages unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.

Storage incompatibility

Sodium hydroxide/ potassium hydroxide:

- reacts with water evolving heat and corrosive fumes
- reacts violently with acids, trans-acetylene dichloride, aminotetrazole, p-bis(1,3-dibromoethyl), benzene, bromoform, halogenated compounds, nitrogen-containing compounds, organic halogens, chlorine dioxide ((explodes), chloroform, cresols, cyclopentadiene, 4-chloro-2-methylphenol,

Continued...

- cis-dichloroethylene, 2,2-dichloro-3,3-dimethylbutane, ethylene chlorohydrin, germanium, iodine pentafluoride, maleic anhydride, p-nitrotoluene,nitrogen trichloride, o-nitrophenol, phosphonium iodide, potassium peroxodisulfate, propylene oxide, 1,2,4,5-tetrachlorobenzene (highly toxic substance is forme), 2,2,3,3-tetrafluoro-1-propanol, tetrahydrofuran, thorium dicarbide, trichloroethanol, 2,4,6-trinitrotoluene, vinyl acetate
- reacts with fluorine, nitroalkanes, (forming explosive compounds)
- incompatible with acetic acid, acetaldehyde, acetic anhydride, acrolein, acrylonitrile, allyl chloride, organic anhydride, acrylates, alcohols, aldehydes, alkylene oxides, substituted allyls, ammonium chloroplatinate, benzanthrone, bromine, benzene-1,4-diol, carbon dioxide, cellulose nitrate, chlorine trifluoride, 4-chlorobutyronitrile, chlorohydrin, chloronitrotoluenes, chlorosulfonic acid, cinnamaldehyde, caprolactam solution, chlorocresols, 1,2-dichloroethylene, epichlorohydrin, ethylene cyanohydrin, formaldehyde (forms formic acid and flammable hydrogen gas), glycols, glyoxal, hexachloroplatinate, hydrogen sulfide, hydroquinone, iron-silicon, isocyanates, ketones, methyl azide, 4-methyl-2-nitrophenol, mineral acids (forming corresponding salt),nitrobenzene, N-nitrosohydroxylamine, nitrates pentol, phenols, phosphorus, phosphorus pentaoxide, beta-propiolactone, sodium, sulfur dioxide, tetrahydroborate, 1,1,1,2-tetrachloroethane, 2,2,2-trichloroethanol, trichloronitromethane, zirconium
- ignites on contact with cinnamaldehyde or zinc and reacts explosively with a mixture of chloroform and methane
- forms heat-, friction-, and/ or shock-sensitive- explosive salts with nitro-compounds, cyanogen azide, 3-ethyl-4-hydroxy-1,2,5-oxadiazole, 3-methyl-2-penten-4-yn-1-ol, N,N'-bis(2,2,2-trinitroethyl)urea, trichloroethylene (forms dichloroacetylene)
- increase the explosive sensitivity of nitromethane
- attacks some plastics, rubber, coatings and metals: aluminium, tin, zinc,etc, and their alloys, producing flammable hydrogen gas

- In presence of moisture, the material is corrosive to aluminium, zinc and tin producing highly flammable hydrogen gas.
- Avoid strong acids, acid chlorides, acid anhydrides and chloroformates.
- Avoid contact with copper, aluminium and their alloys.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	sodium hydroxide	Sodium hydroxide	Not Available	Not Available	2 mg/m3	Not Available

EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
sodium hydroxide	Sodium hydroxide	Not Available	Not Available	Not Available

Ingredient	Original IDLH	Revised IDLH
sodium hydroxide	10 mg/m3	Not Available

MATERIAL DATA

for sodium hydroxide:
The TLV-C is recommended based on concentrations that produce noticeable but not excessive, ocular and upper respiratory tract irritation.

Exposure controls

Appropriate engineering controls	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are: Process controls which involve changing the way a job activity or process is done to reduce the risk. Enclosure and/or isolation of emission source which keeps a selected hazard 'physically' away from the worker and ventilation that strategically 'adds' and 'removes' air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use. Employers may need to use multiple types of controls to prevent employee overexposure. Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection. An approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area.
Personal protection	
Eye and face protection	▸ Safety glasses with unperforated side shields may be used where continuous eye protection is desirable, as in laboratories; spectacles are not sufficient where complete eye protection is needed such as when handling bulk-quantities, where there is a danger of splashing, or if the material may be under pressure. ▸ Chemical goggles.whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted. ▸ Full face shield (20 cm, 8 in minimum) may be required for supplementary but never for primary protection of eyes; these afford face protection. ▸ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]
Skin protection	See Hand protection below
Hands/feet protection	▸ Elbow length PVC gloves ▸ When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.
Body protection	See Other protection below
Other protection	▸ Overalls. ▸ PVC Apron. ▸ PVC protective suit may be required if exposure severe. ▸ Eyewash unit.

Continued...

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Clear Slightly Greyish Liquid

Physical state	Liquid	**Relative density (Water = 1)**	1.30 - 1.35
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not Available
pH (as supplied)	12 - 14	**Decomposition temperature**	Not Available
Melting point / freezing point (°C)	Not Available	**Viscosity (cSt)**	Not Available
Initial boiling point and boiling range (°C)	Not Available	**Molecular weight (g/mol)**	Not Available
Flash point (°C)	Not Available	**Taste**	Not Available
Evaporation rate	Not Available	**Explosive properties**	Not Available
Flammability	Non Flammable	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Available	**Surface Tension (dyn/cm or mN/m)**	Not Available
Lower Explosive Limit (%)	Not Available	**Volatile Component (%vol)**	Not Available
Vapour pressure (kPa)	Not Available	**Gas group**	Not Available
Solubility in water (g/L)	Miscible	**pH as a solution (1%)**	12 - 13
Vapour density (Air = 1)	Not Available	**VOC g/L**	Not Available

SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	▸ Unstable in the presence of incompatible materials. ▸ Product is considered stable. ▸ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled	Evidence shows, or practical experience predicts, that the material produces irritation of the respiratory system, in a substantial number of individuals, following inhalation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may however, produce further lung damage resulting in the impairment of gas exchange, the primary function of the lungs. Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system. Inhalation of alkaline corrosives may produce irritation of the respiratory tract with coughing, choking, pain and mucous membrane damage. Pulmonary oedema may develop in more severe cases; this may be immediate or in most cases following a latent period of 5-72 hours. Symptoms may include a tightness in the chest, dyspnoea, frothy sputum, cyanosis and dizziness. Findings may include hypotension, a weak and rapid pulse and moist rales. Severe acute sodium hydroxide dust inhalation exposure may be fatal due to spasm, inflammation and oedema of the larynx and bronchi, chemical pneumonitis and severe pulmonary oedema. Symptoms of overexposure include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting. The material has **NOT** been classified by EC Directives or other classification systems as 'harmful by inhalation'. This is because of the lack of corroborating animal or human evidence. In the absence of such evidence, care should be taken nevertheless to ensure exposure is kept to a minimum and that suitable control measures be used, in an occupational setting to control vapours, fumes and aerosols.
Ingestion	Ingestion of alkaline corrosives may produce immediate pain, and circumoral burns. Mucous membrane corrosive damage is characterised by a white appearance and soapy feel; this may then become brown, oedematous and ulcerated. Profuse salivation with an inability to swallow or speak may also result. Even where there is limited or no evidence of chemical burns, both the oesophagus and stomach may experience a burning pain; vomiting and diarrhoea may follow. The vomitus may be thick and may be slimy (mucous) and may eventually contain blood and shreds of mucosa. Epiglottal oedema may result in respiratory distress and asphyxia. Marked hypotension is symptomatic of shock; a weak and rapid pulse, shallow respiration and clammy skin may also be evident. Circulatory collapse may occur and, if uncorrected, may produce renal failure. Severe exposures may result in oesophageal or gastric perforation accompanied by mediastinitis, substernal pain, peritonitis, abdominal rigidity and fever. Although oesophageal, gastric or pyloric stricture may be evident initially, these may occur after weeks or even months and years. Death may be quick and results from asphyxia, circulatory collapse or aspiration of even minute amounts. Death may also be delayed as a result of perforation, pneumonia or the effects of stricture formation. Ingestion of sodium hydroxide may result in severe burns to the mouth, throat and stomach, pain, nausea and vomiting, swelling of the larynx and subsequent suffocation, perforation of the gastro-intestinal tract. A 1% aqueous solution (pH 13.4)of sodium hydroxide failed to cause gastric, oesophageal or other damage in rabbits. The material has **NOT** been classified by EC Directives or other classification systems as 'harmful by ingestion'. This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, ingestion of insignificant quantities is not thought to be cause for concern.

Continued...

Skin Contact	The material can produce severe chemical burns following direct contact with the skin. Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions. Sodium hydroxide burns are not immediately painful; onset of pain may be delayed minutes or hours; thus care should be taken to avoid contamination of gloves and boots. A 5% aqueous solution of sodium hydroxide applied to the skin of rabbits for 4 hours produced severe necrosis. Instillation of a 1% solution into the conjunctival sac failed to produce ocular or conjunctival injury in rabbits provided the eye was promptly irrigated with copious amounts of water. Skin contact with alkaline corrosives may produce severe pain and burns; brownish stains may develop. The corroded area may be soft, gelatinous and necrotic; tissue destruction may be deep. Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
Eye	When applied to the eye(s) of animals, the material produces severe ocular lesions which are present twenty-four hours or more after instillation. Direct contact with alkaline corrosives may produce pain and burns. Oedema, destruction of the epithelium, corneal opacification and iritis may occur. In less severe cases these symptoms tend to resolve. In severe injuries the full extent of the damage may not be immediately apparent with late complications comprising a persistent oedema, vascularisation and corneal scarring, permanent opacity, staphyloma, cataract, symblepharon and loss of sight.
Chronic	Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Gastrointestinal disturbances may also occur. Chronic exposures may result in dermatitis and/or conjunctivitis. Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Caustic Soda 30%	TOXICITY	IRRITATION
	Not Available	Not Available

sodium hydroxide	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: 1350 mg/kg[2]	Eye (rabbit): 0.05 mg/24h SEVERE
		Eye (rabbit):1 mg/24h SEVERE
		Eye (rabbit):1 mg/30s rinsed-SEVERE
		Skin (rabbit): 500 mg/24h SEVERE

Legend:	*1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances*

Caustic Soda 30%	Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

Acute Toxicity	⊘	**Carcinogenicity**	⊘
Skin Irritation/Corrosion	✔	**Reproductivity**	⊘
Serious Eye Damage/Irritation	✔	**STOT - Single Exposure**	✔
Respiratory or Skin sensitisation	⊘	**STOT - Repeated Exposure**	⊘
Mutagenicity	⊘	**Aspiration Hazard**	⊘

Legend: ✘ *– Data available but does not fill the criteria for classification*
✔ *– Data available to make classification*
⊘ *– Data Not Available to make classification*

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

Caustic Soda 30%	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	Not Available	Not Available	Not Available	Not Available	Not Available

sodium hydroxide	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	LC50	96	Fish	125mg/L	4
	EC50	96	Algae or other aquatic plants	3180000mg/L	3
	NOEC	96	Fish	56mg/L	4

Legend:	*Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12*

Continued...

	(QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

Prevent, by any means available, spillage from entering drains or water courses.
DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
sodium hydroxide	LOW	LOW

Bioaccumulative potential

Ingredient	Bioaccumulation
sodium hydroxide	LOW (LogKOW = -3.8796)

Mobility in soil

Ingredient	Mobility
sodium hydroxide	LOW (KOC = 14.3)

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal	▸ **DO NOT** allow wash water from cleaning or process equipment to enter drains. ▸ It may be necessary to collect all wash water for treatment before disposal. ▸ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. ▸ Where in doubt contact the responsible authority. ▸ Recycle wherever possible. ▸ Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified. ▸ Treat and neutralise at an approved treatment plant. ▸ Treatment should involve: Neutralisation with suitable dilute acid followed by: burial in a land-fill specifically licensed to accept chemical and / or pharmaceutical wastes or Incineration in a licensed apparatus (after admixture with suitable combustible material). ▸ Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

SECTION 14 TRANSPORT INFORMATION

Labels Required

	
Marine Pollutant	NO
HAZCHEM	2R

Land transport (ADG)

UN number	1824
UN proper shipping name	SODIUM HYDROXIDE SOLUTION
Transport hazard class(es)	Class: 8 Subrisk: Not Applicable
Packing group	II
Environmental hazard	Not Applicable
Special precautions for user	Special provisions: Not Applicable Limited quantity: 1 L

Air transport (ICAO-IATA / DGR)

UN number	1824
UN proper shipping name	Sodium hydroxide solution
Transport hazard class(es)	ICAO/IATA Class: 8 ICAO / IATA Subrisk: Not Applicable ERG Code: 8L
Packing group	II
Environmental hazard	Not Applicable

Continued...

Special precautions for user	Special provisions	A3 A803
	Cargo Only Packing Instructions	855
	Cargo Only Maximum Qty / Pack	30 L
	Passenger and Cargo Packing Instructions	851
	Passenger and Cargo Maximum Qty / Pack	1 L
	Passenger and Cargo Limited Quantity Packing Instructions	Y840
	Passenger and Cargo Limited Maximum Qty / Pack	0.5 L

Sea transport (IMDG-Code / GGVSee)

UN number	1824	
UN proper shipping name	SODIUM HYDROXIDE SOLUTION	
Transport hazard class(es)	IMDG Class	8
	IMDG Subrisk	Not Applicable
Packing group	II	
Environmental hazard	Not Applicable	
Special precautions for user	EMS Number	F-A , S-B
	Special provisions	Not Applicable
	Limited Quantities	1 L

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

SECTION 15 REGULATORY INFORMATION

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

SODIUM HYDROXIDE(1310-73-2) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Exposure Standards
Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Inventory of Chemical Substances (AICS)
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix E (Part 2)
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix F (Part 3)
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 10 / Appendix C
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6

National Inventory Status

National Inventory	Status
Australia - AICS	Y
Canada - DSL	Y
Canada - NDSL	N (sodium hydroxide)
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	Y
Japan - ENCS	Y
Korea - KECI	Y
New Zealand - NZIoC	Y
Philippines - PICCS	Y
USA - TSCA	Y
Legend:	*Y = All ingredients are on the inventory* *N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)*

SECTION 16 OTHER INFORMATION

Revision Date	14/06/2016
Initial Date	18/04/2016

Other information

Ingredients with multiple cas numbers

Name	CAS No
sodium hydroxide	1310-73-2, 12200-64-5

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

Continued...

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

PC—TWA: Permissible Concentration-Time Weighted Average
PC—STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit。
IDLH: Immediately Dangerous to Life or Health Concentrations
OSF: Odour Safety Factor
NOAEL :No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index

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15 Site Induction Sheet

INDUCTION: Contractors and Visitors to
MUSWELLBROOK RECYCLED WASTER WATER WORKS
TO BE COMPLETED BY THE PERSON INDUCTING THE CONTRACTORS OR VISITORS

- ☐ The visitor/s introduced to relevant council staff at Recycled Waste Water Works and community members if relevant.
- ☐ The visitor/s sign in the visitor's book.
- ☐ The location of the site facilities explained.

  e.g. toilets, smoking area, medical kit, fire extinguishers, chemical showers/eyewash.
- ☐ The emergency assembly point was shown and evacuation procedure was explained.
- ☐ The First Aid Officer was introduced.
- ☐ An overview of the site was given and the chemicals used on site was explained:
  - ➢ Sodium Hypochlorite
  - ➢ Aluminium Sulphate
  - ➢ Polymer
  - ➢ Laboratory Chemicals
- ☐ Wastewater contains pathogens and other harmful microorganisms.
- ☐ The type of and the location of the safety equipment and PPE was explained.
- ☐ General Construction Induction card sighted (if applicable)
- ☐ Corporate WHS & Code of Conduct Induction completed (if applicable)
- ☐ Directed on *no go areas*, without supervision. This includes the chemical rooms, and the rest of the water treatment building
- ☐ Any other issues explained

……
……

Staff Inducting: …….. **Signature: ……**

	INDUCTED PERSON	ORGANISATION	SIGNATURE
1			
2			
3			
4			
5			
6			

Date ……

**** ORIGINAL TO BE SCANNED AND E-MAILED TO HUMAN RESOURCES, FIRST COPY TO THE INDUCTED PERSON (MUST BE KEPT BY PERSON WHILE ON SITE) AND THE COPY IN THE BOOK TO STAY ON SITE****

16 Staff Register Record of Training