



NSW NATIONAL PARKS & WILDLIFE SERVICE

# Pollution Response Incident Management Plan

Perisher Range sewerage system



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# 1. Introduction

The primary pollution incidents that may occur within the Perisher Range sewerage system (PRSS) are sewage overflows. Historically, sewage overflows from the PRSS are infrequent. Within the reticulation system (excluding the pumping stations) sewage spills can be contained with the resultant risk to public health and/or the environment being assessed as low. A spill that does enter Perisher Creek could potentially impact downstream users in the catchment (including those that source water supplies from Lake Jindabyne, Lake Eucumbene and Khancoban Pondage) if the strength and quantity of the sewage was significant.

Overflows that may occur from the sewage pumping stations or the Perisher Sewage Treatment Plant (STP) would result from a major malfunction within the system or part of the system (e.g. switchboard failure, power outage combined with failure of generator, rising main failure, etc.) which is a rare occurrence. The resultant level of risk to the environment of such an event is assessed as moderate taking into account the response time in controlling the spill and the nature of the receiving environment.

The PRSS is unique in New South Wales as the system is only fully functional in winter when virtually the entire reticulation system can be covered with up to two metres of snow. It is, therefore, possible that a localised surcharge may go unnoticed and only become evident during or after snow-melt. When surcharges have been identified, containment of the liquid is generally not possible, however, snow tends to hold back the solids which are then able to be collected and disposed of.

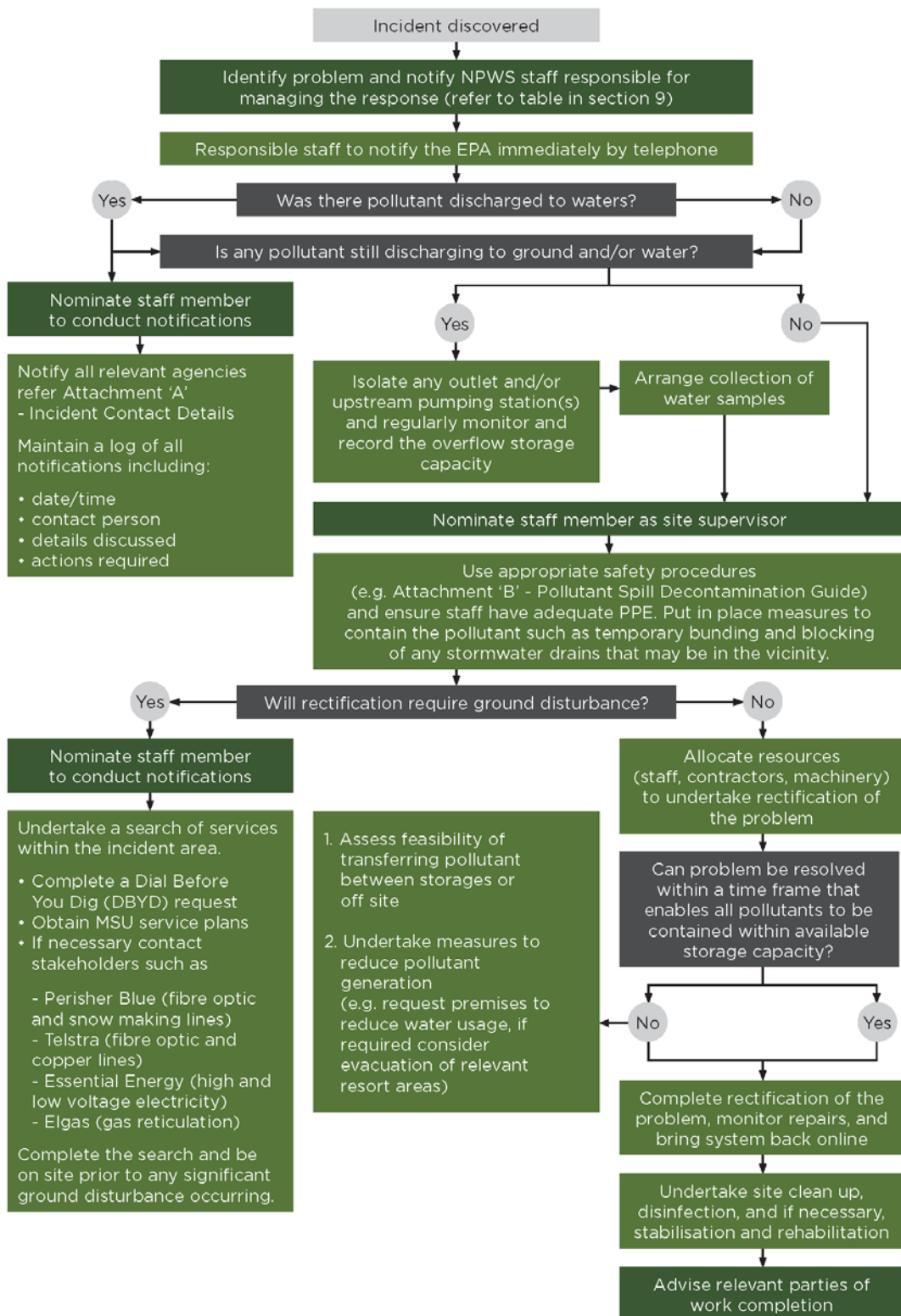
To reduce the likelihood of sewage spills, Office of Environment and Heritage (OEH) undertakes a number of pre-emptive actions including both operational and maintenance activities as detailed in Operational Environmental Management Plan (OEMP).

The possible sewer surcharge scenarios that have been identified in the following sections.

Another potential pollutant incident is the risk that chemicals used within the Perisher STP may be accidentally discharged through accidents or staff error. The response measures to this type of incident is also detailed in this plan.

The actions implemented in response to these scenarios may vary depending on the type of incident. However, the general response procedure that is to be followed for any pollution incident as shown diagrammatically below.

## Pollution Response Incident Management Plan



**Figure 1 Response procedure for pollution incident**

## 2. Localised sewer surcharge

Localised sewer surcharges occur infrequently in the Perisher Range reticulation generally as a result of external interference (e.g. pipes broken during excavation, etc.) with subsequent poor repair work, or larger debris that has entered the reticulation system (rocks, timber). The normal urban reticulation problems such as fat build-up and tree root invasion are rare.

The volume of sewage discharged from these events varies depending on the location within the reticulation system. If the sewer surcharge is located in part of the gravity reticulation system, the volumes are generally small if promptly detected. By comparison, a surcharge in part of the reticulation that also is fed by a pump station (e.g. downstream of Smiggin Holes sewage pumping station (SPS) or Perisher SPS 2) will potentially result in larger volumes of sewage being discharged.

In most cases, the surcharge is caused by a blockage at the outlet of a manhole. In these cases, rectification is relatively straightforward. Once the excess sewage is removed (by isolating the inflow and waiting for backed up sewage to drain or by pumping to a downstream manhole or waste contractor) the cause of the blockage can be identified and removed. If the blockage is between manholes, rectification may take longer through the use of an electric eel (also known as a 'sewer snake') or in more difficult cases by excavation of the problem area.

## 3. Rising main failure

A failure in a sewer rising main is a significant event and can result in the loss of large volumes of sewage to the environment. Failure of a sewer rising main can be the result of damage to the pipe that may have occurred during other works undertaken in close proximity to the pipeline, or may result through fatigue and degradation of the pipe over time.

Rising main failures are most likely to occur in the winter months when the sewerage reticulation system is operating under greater loads. As such, the physical detection of these failures may not be immediately evident due to significant snow cover. Identification through inconsistencies in the flow data between various locations of the reticulation network is one means of detection. Several SCADA (supervisory control and data acquisition) alarms have been implemented to assist in identifying these events. It is noted that these may still generate false alarms given the nature of the winter season where visitation (and hence sewage loads) may fluctuate significantly from day to day.

Responses to rising main failures need to be immediate and all available resources utilised to rectify the problem as soon as possible. Under peak loads, the sewage storage capacity within the reticulation system is typically limited to four hours or less and as such, restoring the rising main within this time frame is critical to minimise environmental harm and to prevent significant disruption to the resort operations.

It may be beneficial (and sometimes necessary) to communicate to stakeholders the urgent need to minimise water consumption to assist in temporarily reducing the load on the sewerage reticulation system. This can be done by door knocking, telephone calls or SMS messaging.

In extreme cases, consideration may need to be given to evacuating relevant areas of the resort and/or isolating the village water supply. This would require approval by the Director Southern Ranges Branch, consultation with stakeholders, and would also need to consider factors such as the requirement to maintain a water supply for fire emergencies, etc.

Given the magnitude of sewer potentially discharged from a rising main failure, in nearly all cases notification to all relevant authorities and stakeholders will be required. As per the pollution incident management procedures, a staff member should be dedicated solely to this task and must keep a detailed log of all notifications.

## **4. Sewer surcharge from a pumping station and/or the Perisher STP**

Any surcharge from the sewage pumping stations (SPS) or the Perisher STP will result in sewage being discharged to a nearby creek or water body. Containment of surcharging sewage may not be possible.

Possible incidents that may result in surcharge from any SPS or the Perisher STP include:

- Total power outage including failure of the stand-by generator.
- Failure of the two in-service pumps.
- Switchboard fire/explosion.
- Inundation of the system through infiltration, stormwater inflow or flooding.

Surcharge from a sewage pumping station (SPS) or the Perisher STP can potentially be minimised by utilising other sewage storage tanks within the reticulation system to reduce the load at the affected site until the problem is resolved. Additionally, it may be necessary to consider the engagement of a liquid waste contractor to transfer sewage between locations or off-site. Another method is to communicate to stakeholders the urgent need to minimise water consumption.

Similar to rising main failures, these events will generally require notification to all relevant authorities and stakeholders.

## **5. Inventory of pollutants**

There are a number of chemicals stored and used at the Perisher STP. A full inventory is provided Attachment C and the storage locations are shown on the maps provided in Attachment D.

## **6. Chemical discharge to the environment from Perisher STP**

The risk of environmental harm from a spill of the chemicals listed in Attachment C is generally considered low given the relatively small quantities stored and the containment systems in place. However, some chemicals that are stored in large quantities and/or are used more frequently in the treatment process have been assessed to pose a medium risk. These include diesel, phosphoric acid, and aluminium chlorohydrate.

There is a potential for these chemicals to be discharged to the environment by the following means:

- Diesel - fuel leak from underground storage tank or internal tank.
- Phosphoric acid – leak from storage container or accidental overdose.
- Aluminium chlorohydrate – leak from storage tank, pipe failure, or accidental overdose.

In the event of a spill or overdose, similar procedures to those listed for sewer discharge are to be followed including notification of all relevant authorities. In these incidents, the key objective is to capture and contain the pollutant as soon as practical to minimise the discharge to the environment.

For diesel fuel leaks this may be through temporary bunding and absorption of spills. Fire and Rescue NSW should also be utilised in the clean up of fuel spills wherever possible.

Leaks from within the STP or accidental overdosing of chemicals will require the containment of the contaminated effluent. Depending on the time of year, there may be available storage space within the catch/balance pond, extended aeration tanks, sludge storage area or the effluent may need to be transferred off-site.

As per the general response procedure shown in section 1, as soon as staff become aware of a leak or chemical overdosing the system should be immediately isolated and at the same time the Supervisor Water and Wastewater or Manager contacted for advice and assistance.

## **7. Public notification**

Where required, a number of public notification mechanisms are available such as:

- Direct phone calls to stakeholders and lodge managers.
- Text messages to stakeholders and lodge managers.
- Premise to premise door knocking.
- Media releases (via the OEHL Public Affairs Branch).

Any form of public notification is to be approved and coordinated by the Manager, Southern Ranges Services. Additionally, public notifications should be undertaken in consultation with the NSW Health, Public Health Unit.

## **8. Incident response equipment**

Personal Protective Equipment (PPE) is located at all sewage pumping stations, Perisher STP, and the National Parks and Wildlife Service (NPWS) Perisher Valley office. Spill kits are located at the Perisher STP and the NPWS Perisher Valley workshop. An emergency response kit is also located in the NPWS workshop that includes a variety of tools such as valve keys, and manhole lifters. This kit also contains a full set of plans of the Perisher Range sewerage system, water reticulation network, and stormwater system. Additional hard copies of these plans are held by staff, and electronic copies are on the network drive.



## 9. Responsible staff

All staff are responsible for undertaking actions in response to a pollution incident in order to mitigate potential impacts. It is expected that any staff member that becomes aware of an incident begins to implement the procedures set out in this document including notifying supervisors and other staff for assistance.

In the event of an incident, one or more of the staff listed below are responsible for managing the response and are authorised to notify relevant authorities as required.

**Table 1 Response management staff**

Position	Name	Contact Details
Manager, Southern Ranges Services	Ryan Petrov	Work: 02 6450 5629 Mobile: 0408 225 528
Supervisor Water and Wastewater	David Scarlett	Work: 02 6457 4414 Mobile: 0428 887 607
Supervisor Operations & Maintenance	Greg Harmer	Work: 02 6457 4412 Mobile: 0428 509 412
Director, Southern Ranges Branch	Mick Pettitt	Work: 02 6450 5501 Mobile: 0427 615 674

## 10. Staff training

Familiarisation of these procedures must form part of the induction process for any new staff and be documented on the relevant induction records. For existing staff, a formal re-familiarisation should occur with every revision rollout of the OEMP.

Practical implementation of these procedures should occur at a minimum of once every three years. This may require a simulated incident if no real situations present themselves within this time period. Any incident that does occur (including simulations) should be followed up with a debrief with all relevant staff. This debrief should include a critical review of these procedures. The results of the debrief are to be documented and any relevant changes to the procedures made and implemented as soon as practical.

## Attachment 'A'

### Incident Contact Details

#### How to Use this Document

This document provides contact information for the relevant agencies in the event of a pollution incident.

#### Incidents that present an immediate threat to human health or property

- *Call 000* - Fire and Rescue NSW, the NSW Police and the NSW Ambulance Service are the first responders, as they are responsible for controlling and containing incidents.

If the incident does not require an initial combat agency, or once the 000 call has been made, notify the relevant authorities as below.

#### Authority contact details

#### Environment Protection Authority (EPA)

	Contact Phone	Notes
Environment Line	131 555	24 hour hotline
Manager, South East Region	(02) 6229 7002	Queanbeyan office (business hours only)

#### NSW Health

	Contact Phone	Notes
Public Health Unit, Albury	(02) 6080 8900	After hours diverts to Albury Base Hospital - ask for Public Health Officer on call

Position	Name	Contact Details	Notes
Senior Environmental Health Officer - Population Health	James Allwood	Ph: (02) 6080 8900 Mob: 0418 464 916	

For NSW Health's full notification procedures see attached document 'Water Supply Authority Sewage Overflow Notification to NSW Health Public Health Units'.

**WorkCover Authority**

	Contact Phone	Notes
WorkCover NSW	13 10 50	To be notified of any incident that involves: - the death of a person - a serious injury or illness, or - a dangerous incident

**Fire and Rescue NSW**

	Contact Phone	Notes
Emergency Contact	000	
Pollution incident notification	1300 729 579	
Perisher Valley Station	(02) 6457 5037	Only manned during winter season
Jindabyne Station	(02) 6456 2476	

**National Parks and Wildlife Service**

Position	Name	Contact Details	Notes
Environmental Health Officer	Peter McCarthy	Ph: (02) 6450 5546	

**Perisher Blue Pty Limited**

	Contact Phone	Notes
Perisher Mountain Office	(02) 6459 4408	Business hours only
Perisher Snowmaking	(02) 6459 4561 (02) 6459 4562 (02) 6459 4410	Urgent notification May to October only Contact all hours (if no success contact Michael Fearnside as per details below)

Position	Name	Contact Details	Notes
Operations Director	Michael Fearnside	Ph: (02) 6459 4408 Mob: 0428 484 273	Call mobile after hours
Environment Manager	Tanya Bishop	Ph: (02) 6459 4504 Mob: 0424 946 365	
Safety Manager	David Milford	Ph: (02) 6459 4414 Mob: 0416 166 433	

## Snowy Hydro

	Contact Phone	Notes
Snowy Hydro, Cooma	(02) 6453 2888	Business hours only
Safety & Environmental Incidents	1800 766 333	Redirected to Visitors Centre on weekends. Answering service after hours.

Position	Name	Contact Details	Notes
Environment Manager	Charlie Litchfield	Mob: 0427 773 504	
Area Manager, Kosciuszko	Bill Hunter	Mob: 0409 220 289	See note below

### Note:

In the event of a sewer spill to Perisher Creek, the Area Manager, Kosciuszko is to be contacted ASAP to ascertain if water is being diverted from Guthega Dam. If water is being diverted, the following councils need to be located depending on the destination:

- Snowy River Shire Council - Lake Jindabyne  
- Lake Eucumbene;
- Tumbarumba Shire Council - Khancoban Pondage.

**Snowy Monaro Council**

Position	Name	Contact Details	Notes
Group Manager Water and Waste Water Services	Gnai Ahamat	Ph: (02) 6451 1171 Mob: 0418 284 553	
Sewer Supervisor	Dennis Pilkington	Mob: 0408 484 853	
Water Supervisor	Grant Holmes	Mob: 0418 672 523	

**Tumbarumba Shire Council**

Position	Name	Contact Details	Notes
Director of Strategy Communication and Development	Gus Cox	Ph: (02) 6948 9116 Mob: 0427 618 746	
Director of Assets and Infrastructure	Matthew Christenson	Ph: (02) 6948 9100	
Khancoban Town Manager	Adrian Cass	Ph: (02) 6076 9508 Mob: 0427 919 856	

**Note:**

Khancoban drinking water supply is extracted from above Khancoban Pondage. Nonetheless, Tumbarumba Shire Council is to be notified if there is a risk of contamination to Khancoban Pondage.

## WATER SUPPLY AUTHORITY SEWAGE OVERFLOW NOTIFICATION TO NSW HEALTH PUBLIC HEALTH UNITS

### 1. INTRODUCTION

The Environment Protection Authority (EPA) licenses Local Councils sewerage systems. The conditions of the licence include notification to Public Health Units of incidents within the sewerage system, which are of public health significance. A risk to public health will exist when people are exposed to untreated or inadequately treated sewage.

A variety of overflow and bypass incidents can occur either within the sewage reticulation system or at the sewage treatment plant (STP). Of these incidents, dry weather pollution events are considered to present a potentially significant risk to public health. These events result in untreated sewage being discharged into the surrounding environments, including creeks and streams. Unlike wet weather events there is no significant dilution of the sewage. During dry weather there is a higher demand for recreational use of our inland waterways and coastal beaches increasing the potential exposure of people to sewage. The community would also not be anticipating pollution of a recreational water body during dry weather.

Inland waterways and coastal beaches are used for a range of activities where increased levels of pollution may pose a risk to public health. Some of these activities include:

- Primary and secondary recreational activities including swimming, water skiing, surfing;
- Domestic use including potable and non potable uses;
- Livestock feed water;
- Irrigation of crops;
- Other riparian land users;
- Aquaculture industries, including fish and especially shellfish industries.

In considering the impact on any of these activities the public health risk relates to the proximity of the incident to the activity, the approximate concentration of pathogens within the effluent, the volume of effluent released to the environment and dilution factors within the environment.

### 2. EVENT DEFINITIONS

#### a) Bypasses

Sewage is received at the STP and discharged without receiving some or all of the designed treatment processes. This can occur in both dry and wet weather.

- During dry weather, bypasses may also occur because of equipment failure or power loss to the STP.  
(This is considered a potential health risk especially if disinfection is compromised).
- During wet weather, bypasses may occur because of excess stormwater entering the system. Sewage that is capable of being treated by the STP process is treated and any additional sewage bypasses some of the treatment processes.  
(This is considered a potential health risk and contributes to an overall increased health risk during and following rain events along with the input of contaminated stormwater).

**b) Overflows**At STPs

Occurs when the incoming flow exceeds the disinfection capacity ie. Sewage continues to go through the treatment process but exceeds the disinfection process capacity.

- This usually occurs in wet weather.  
(This is considered a potential health risk and contributes to an overall increased health risk during and especially following rain events along with the input of contaminated stormwater).

In the reticulation system

Can occur in any part of the system both by design in wet weather or system failure, in both wet and dry weather.

- Dry weather overflows are due to system breakdowns such as blockage of the sewer caused by tree roots or, sewage pumping stations (SPS) failures due to events such as a power failure.  
(This is considered a potential health risk depending on location and extent of the overflow).
- Wet weather overflows are primarily due to excess stormwater entering the system and flows exceeding pipe or pump capacity. Directed overflows from the reticulation system occur in wet weather and are designed to provide relief points in the system when excessive rainfall from storm events enters the sewerage system.  
(This is considered a potential health risk and contributes to an overall increased health risk during rain events along with the input of contaminated stormwater).

**3. NOTIFICATION CONDITIONS**

The health risk associated with sewage overflows and bypasses will vary with each incident depending on the population exposed eg. swimmers, school children. The majority of these are overflows on customers' properties as a result of chokes in the sewerage system. However, some of these overflows discharge to waterways or to public locations in both dry and wet weather.

The Public Health Unit should be notified of incidents that present a risk to public health. The notification process be separated into immediate notification of incidents, which represent a potentially increased risk to public health, and other incidents that pose a lower risk to public health.

The determination of an incident, which would be considered to pose a significant health risk, requires a degree of site investigation and subjective judgement of the situation on the part of Water Supply Authority. Requirements for incidents to be reported are defined below.

### 3.1 Immediate notification

**IMMEDIATE NOTIFICATION TO THE PUBLIC HEALTH UNIT IS TO OCCUR AS SOON AS PRACTICABLE FOLLOWING NOTIFICATION TO WATER SUPPLY AUTHORITY OF INCIDENTS WHICH REPRESENT A POTENTIAL INCREASED RISK TO PUBLIC HEALTH, AS DEFINED BELOW.**

Notification is to occur as follows:

1. By phone during office hours 9am - 5pm. All information is to be faxed as soon as practicable;
2. By phone outside office hours (7am to 9am; 5pm to 10pm on normal working days; 7am to 10pm on weekends and public holidays). All Information is to be faxed on next working day.
3. Phone number on .....  
Fax number on .....

**Note 1:** Notifications occurring between 10pm and 7am should be reported by phone the next morning at 7am and information faxed unless requested otherwise.

**Note 2:** Not all the requested information may be available at the time of reporting eg. for reticulation overflows volume estimates can't be provided. However, currently SWC provides information on the number of customers connected upstream of the overflow which provides an indication of the catchment size. This information generally takes a longer period to collect and should be provided by the next working day.

#### a) Criteria for immediate notification

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

- 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.
- Inside a child care centre or school or in close proximity to schools where there is assessed to be a high risk of exposure of children to the overflow incident.
- In close proximity to known high use recreational sites in waterways (primary or secondary use). For secondary use, this includes high use access locations – such as boat ramps, sailing club access etc.
- When the Shellfish Quality Assurance Program (SQAP) is notified.
- When the duration of sewage discharge exceeds 12hrs, from the time of notification to SWC.
- Bypass at a STP where disinfection has been compromised. Disinfection may be compromised as a result of a direct bypass of the disinfection facility; failure of disinfection equipment; or ineffectiveness of disinfection due to bypass of upstream treatment processes.
- Bypassing of the Deep Water Ocean Outfalls at North Head, Bondi and Malabar STPs.



**b) Information required on immediate notification****Phone**

Site (address).

Reason for notification eg. Within 10 m of a school.

Time of notification to Water Supply Authority of discharge.

Action taken.

**Fax**

Site (address).

Reason for notification eg. Within 10 m of a school.

Time of notification to Water Supply Authority of discharge.

Known period of discharge.

Action taken.

Known volume or estimated volume of sewage released.

This may include the provision of information on the number of customers connected upstream of the site, providing an indication of the catchment size.

**3.2 Summarised Notification**

Summarised notification to the Public Health Unit, by the way of a monthly summary, to be sent by the 5th working day of the following month is to occur for other events of potential public health significance, of much lower priority. (Although delayed summarised information will not allow for immediate follow-up by the Public Health Unit, it may be useful in identifying specific trouble spots).

In addition to the events described below, the Summary is to include in a separate table those events for which immediate notification was given.

**a) Criteria for summarised notification**

- Dry weather events where sewage is discharged to waterways (other than those outlined in 3.1 (a))
- All wet weather events which have resulted in a compromise to disinfection of sewage at a STP.

**b) Information required on summarised notification**

- Summaries are to include:
  - Site of discharge (address);
  - Site of potential human exposure (stream, recreational area or distance from waterway);
  - Time of notification to the Water Supply Authority of discharge;
  - Known period of discharge;
  - Actions taken;
  - Volume (if known);
  - Other agencies notified.

Following review of the monthly summary the Public Health Unit may request results of any water samples collected for waterways where known recreational sites are located or other locations of public health concern.

#### **4. INFORMATION TO THE PUBLIC**

For each event notified, the Water Supply Authority must discuss the need for provision of information to the public eg media release, radio announcement, signage etc, with the Public Health Unit.

## Attachment 'B'

# Pollutant Spill Decontamination Guide

### How to Use this Document

This document is a general guide in decontamination of personnel and equipment involved in the rectification of a pollutant spill.

Whilst this guide provides an outline of the general procedures and principles to be followed, the incident site supervisor will be required to make their own judgment according to the site specific requirements.

1. The incident site supervisor must provide a copy of the relevant Job Safety Analysis (JSA) and undertake a Job Safety Brief (JSB) with all personnel (including contractors) prior to the commencement of site activities.
2. If the pollutant is a chemical that has been identified the incident site supervisor must have the relevant Material Safety Data Sheet (MSDS) available and advise all staff of the relevant risks.
3. Wherever possible, all personnel involved in the clean up of a sewage spill should be vaccinated against Hepatitis A and Hepatitis B. Staff that do not have current vaccinations are to be informed of the risks and permitted to be tasked to non front line roles.
4. Personnel in direct contact with contaminants must be dressed in the following personal protective equipment (PPE) prior to the commencement of work.
  - Disposable overalls
  - Rubber gum boots
  - Elbow length rubber gloves
  - Eye protection
5. Personnel to buddy up to ensure PPE is fitted correctly and covering all exposed skin.
6. Site supervisor is responsible for establishing a decontamination area that includes a disinfectant bath.
7. All personnel (including contractors) must dip gloves and boots into disinfectant bath before leaving site and/or operating vehicles etc.
8. Gloves and gum boots are to be placed in a plastic bag and disinfected after incident.
9. Disposable overalls and tape is to be placed in a lined garbage bin for disposal.
10. Site supervisor is responsible for ensuring all used equipment is disposed of appropriately.
11. All equipment that is to be reused must be disinfected and restocked in the appropriate location.

**Decontamination Kit**

A decontamination kit is to be maintained and kept in the Perisher Valley NPWS workshop. The kit is to contain the following stock.

Item	Quantity
Disposable overalls	6 sets
Rubber gum boots	6 pair
Rubber elbow length gloves	6 pair
Duct tape	2 rolls
Nitrile gloves (disposable)	2 boxes
Disinfectant	5 litres
Alcohol hand gel (500 mL)	2
Plastic bags	10
Milk crate	1
Garbage bin (60 L)	1
Cable ties (200 mm)	1 pkt
Eye protection (clear)	6
Current Job Safety Analysis (JSA) - laminated	1 copy
Sewage Spill Decontamination Guide - laminated	1 copy

*The incident site supervisor is responsible for restocking the decontamination kit and ensuring all contaminated equipment has been cleaned and disinfected before it is put away.*

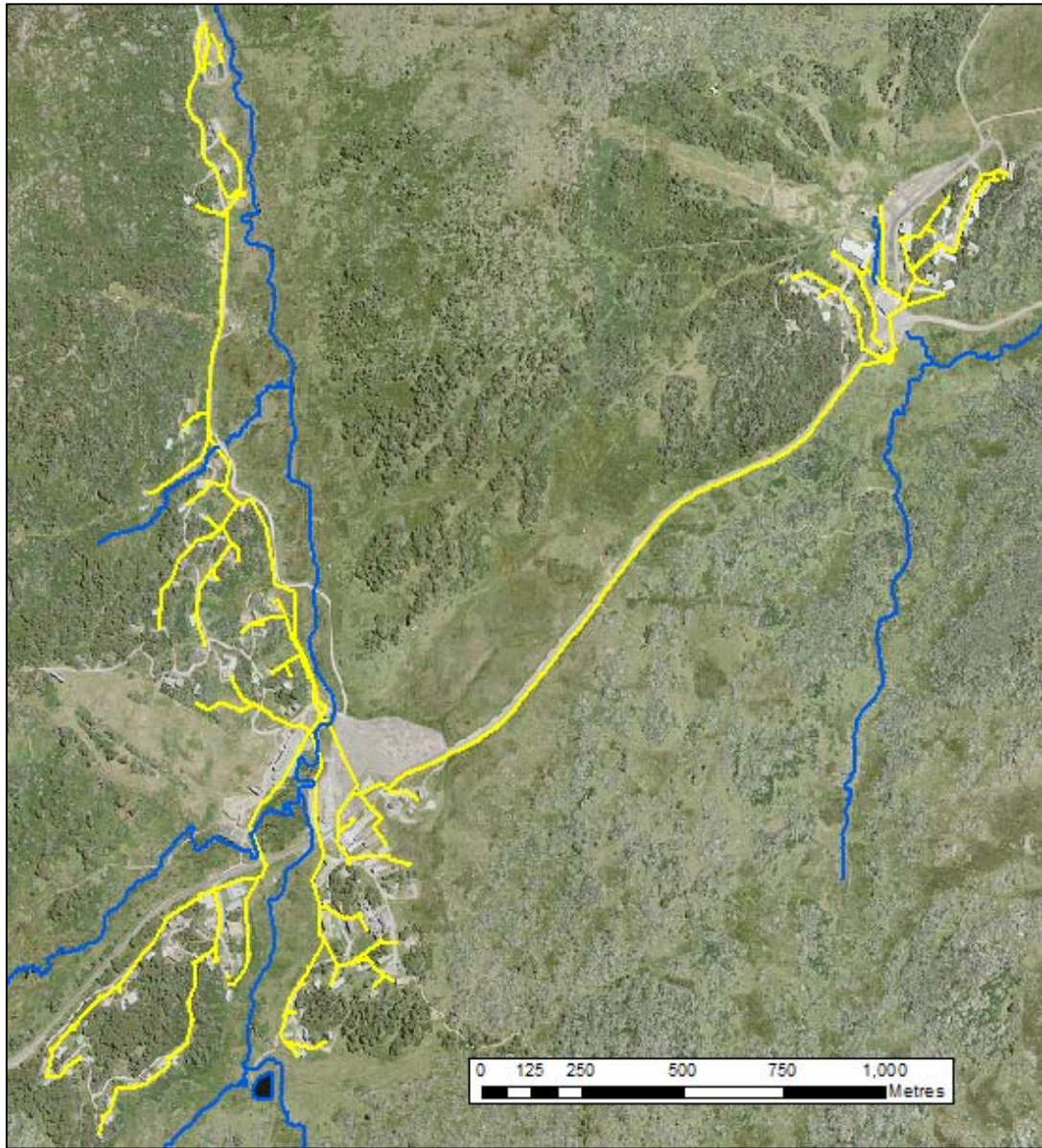
## Attachment 'C' - Pollutant Inventory at Perisher Sewage Treatment Plant

Substance	Use	State	Location	Max amount stored	Type of containment
Diesel	Fuel supply for backup generator	Liquid	Underground fuel tank at south west corner of STP	5,000 L	One (1) x 5 kL dual bladder fibreglass tank
			Generator room	400 L	One (1) x 400 L steel tank with bund
Aluminium Chlorohydrate	Sewage treatment process	Liquid	Western (top) Alchlor room	12,000 L	One (1) x 12 kL fibreglass storage tank
			Eastern (bottom) Alchlor room	17,000 L	Two (2) x 8 kL fibreglass storage tanks Four (4) x 200 L plastic drums
Aluminium Sulphate	Sewage treatment process	Liquid	Western walkway of EAT 1	2,000 L	Two (2) x 1,000 L intermediate bulk containers
Blood and Bone	Feed program	Solid	Dry chemical storage area	21,600 kg	20 pallets x 54 bags (@ 20 kg)
			Inlet works	10,800 kg	10 pallets x 54 bags (@ 20 kg)
Blood Meal	Feed program	Solid	Dry chemical storage area	1,000 kg	One (1) x 1,000 kg bulka bag
Soda Ash	Sewage treatment process	Solid	Dry chemical storage area	24,000 kg	20 pallets x 48 bags (@ 25 kg)
Urea	Sewage treatment process	Solid	Dry chemical storage area	24,000 kg	20 pallets x 48 bags (@ 25 kg)
Sugar	Sewage treatment process	Liquid	Above ground tank on western side of STP	15,000 L	One (1) x 15 kL concrete tank
		Liquid	Western (top) Alchlor room	12,000 L	One (1) x 12 kL fibreglass storage tank
		Solid	Dry chemical storage area	24,000 kg	20 pallets x 48 bags (@ 25 kg)
Hydrated Lime	Sludge treatment process	Solid	Sludge room	2,160 kg	2 pallets x 54 bags (@ 20 kg)
Phosphoric Acid (5%)	Sewage treatment process	Liquid	Inlet works	10,000 L	Ten (10) x 1,000 L intermediate bulk containers
			Sludge room	1,000 L	One (1) x 1,000 L intermediate bulk container
Di-ammonium phosphate (DAP)	Sludge treatment process	Solid	Inlet works	1,200 kg	1 pallet x 48 bags (@ 25 kg)
Emulsion Flocculent (EM640CT)	Sludge dewatering process	Liquid	Sludge room	300 L	Twelve (12) x 25 L plastic drums
Sodium Hypochlorite	Cleaning + algae control	Liquid	Catch/balance pond effluent return pump station	600 L	Forty (40) x 15 L plastic drums
			Sludge room	60 L	Four (4) x 15 L plastic drums
Sodium Thiosulfate	Neutralisation of chlorine	Solid	Sludge room	100 kg	Four (4) x 25 kg bags
Air Solution 9304	Odour neutraliser	Liquid	Northern walkway of EAT 3	220 L	One (1) x 200 L plastic drum One (1) x 20 L plastic drum
Drewgard 4109	Heat exchanger maintenance	Liquid	Generator room	15 L	One (1) x 15 L plastic drum
Biosphere 250	Heat exchanger maintenance	Liquid	Generator room	15 L	One (1) x 15 L plastic drum

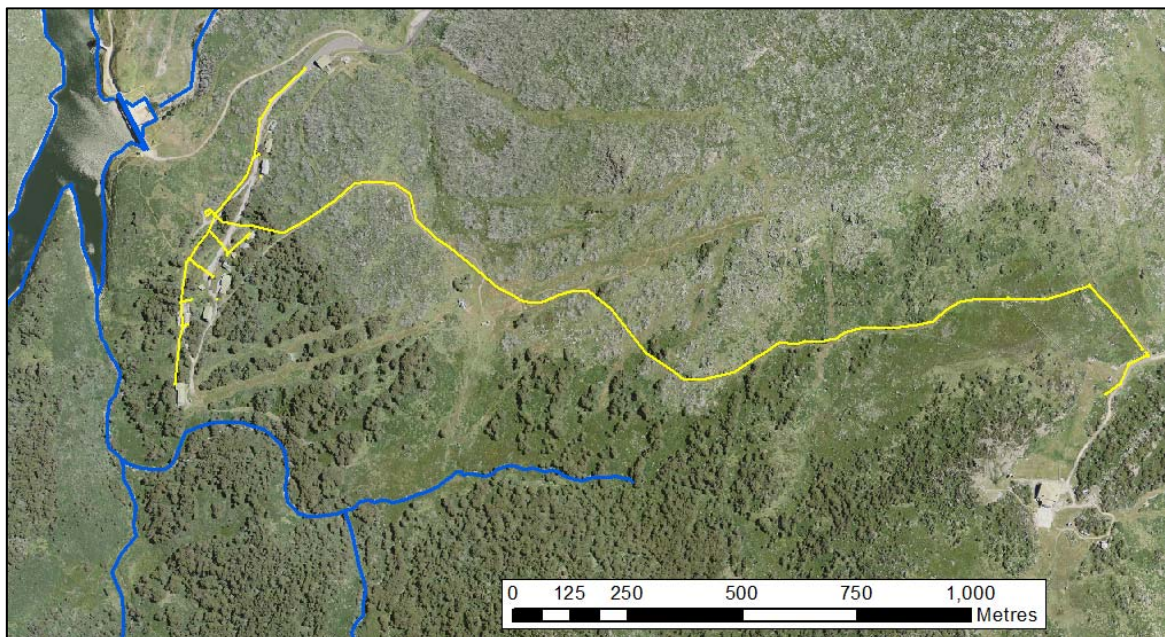
# **Attachment 'D'**

## **System Maps**

- Map 1. Sewerage reticulation system for Perisher Valley and Smiggin Holes.
- Map 2. Sewerage reticulation system for Guthega and Blue Cow.
- Map 3. Aerial photo of Perisher Valley Sewage Treatment Plant.
- Map 4. Layout of Perisher Valley STP showing chemical storage locations.
- Map 5. Stormwater drainage network at Perisher Valley Sewage Treatment Plant.



**Map 1.** Sewerage reticulation system for Perisher Valley and Smiggin Holes.

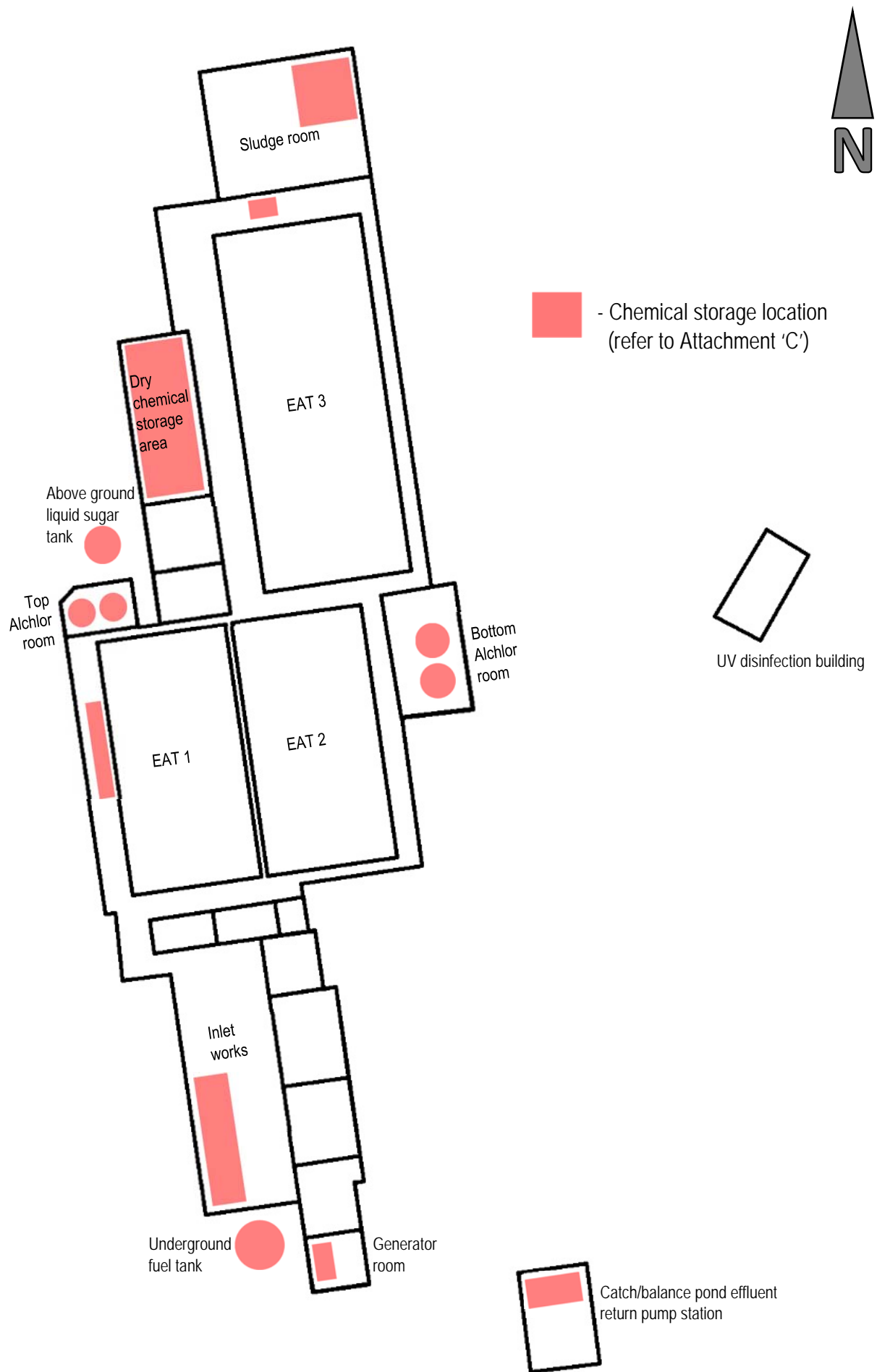


**Map 2.** Sewerage reticulation system for Guthega and Blue Cow.



**Map 3.** Aerial photo of Perisher Valley Sewage Treatment Plant.





**Map 4.** Layout of Perisher Valley Sewage Treatment Plant showing chemical storage locations.



**Map 5.** Stormwater drainage network at Perisher Valley Sewage Treatment Plant.