

SHT Pollution Incident Response Management Sub-Plan – 5.7

WESTERN HARBOUR TUNNEL AND SYDNEY HARBOUR TUNNEL ASSET MANAGER



ACKNOWLEDGEMENT OF COUNTRY

We proudly acknowledge the Gadigal people of the Eora Nation as the Traditional Owners of the lands we are working on and pay our respects to their Elders past and present.

We recognise the deep connection of Traditional Owners to Country and value their contribution to caring for and managing the land, water, natural and built landscapes.

We are committed to pursuing genuine and lasting partnerships with Traditional Owners to understand their culture and connections to Country in the way we plan for and manage the delivery of the Contract.





DOCUMENT CONTROL

The latest version of this Sub-Plan will be available on the Project Management System for Ventia personnel to access.

The WHT/SHT Network Manager is responsible for ensuring that this Sub-Plan is reviewed and approved.

The ICMS/Quality Manager is responsible for updating this Plan to reflect changes to legal and other requirements as required.

ISSUE AUTHORITY

This Plan is a mandatory document and is issued under the authorisation of the WHT/SHT Network Manager. As such, the processes, procedures, practices and methods of control defined herein will be complied with by all personnel engaged on the project and cannot be amended without the agreement of the WHT/SHT Network Manager and the Client's Representative.

This Sub-Plan will be subject to periodic review (in conjunction with the output of internal audits and management review) and, if required, amended to reflect changes in contractual or management requirements or to correct disparity identified during auditing.

DOCUMENT APPROVAL

Action	Title	Name	Signature	Date
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Approved by:	WHT/SHT Network Manager	Anthony Curry		24/02/2023
File Location:	Ventia SHT/WHT PMS, Controlled Documents			

REVISION HISTORY

Each revision of the Plan will be distributed to all registered copyholders with an instruction that the superseded copy be destroyed. Revision changes will be identified and listed in the following table. When amendments occur, the entire document will be reissued with revision number updated accordingly. Prior consultation and acceptance will be sought from the Client prior to submitting any amendments of this Sub-Plan.

Revision	Date	Description	Author
00A	10/08/2022	Initial Draft	Julie Fawx
00.01	21/09/2022	Updated Plan title and Document Control page with new numbering	Amelia Bartak
00.02	9/11/2022	Revisions to incorporate TfNSW feedback	Emma Wright
00.03	24/02/2023	Revision to update contact details and regulatory compliance. Added as an appendix to the Operations Environmental Management Plan.	Tete Awotedu

PLAN TESTING

Test Date	Plan Tester Name	Plan Tester Role	Next Test Date



COMPLIANCE

This Sub-Plan fulfils Contract compliance requirements of the SHT Operations Environmental Management Plan (OEMP). The OEMP's compliance matrix is accessible in the body of the OEMP and via the Master Compliance Table maintained as an Appendix to the Contract Management Plan.

TERMS AND ABBREVIATIONS

Terms and abbreviations used throughout this Plan are listed in Table 1.

TABLE 1: TERMS AND ABBREVIATIONS

Term/abbreviation	Definition
CCTV	Closed-Circuit Television
CWT	Contaminated Water Tank
DG	Dangerous goods
DRS	Disaster Recovery Site
EMSP	SHT Emergency Management Sub Plan
EPA	Environmental Protection Authority
FRNSW	Fire and Rescue New South Wales
GWTP	Ground Water Treatment Plant
ICMS	Integrated Contract Management System
LEMO	Local Emergency Management Organisation
NSW	New South Wales
PIRMSP	Pollution Incident Response Management Sub-Plan
PVS	Pylon Ventilation Station
POEO Act	<i>Protection of the Environment Operations Act 1997 NSW</i>
SHEQ	Safety, Health, Environment and Quality
SHT	Sydney Harbour Tunnel
TACF	Tunnel Administration and Control Facility
TfNSW	Transport for New South Wales
TMC	Traffic Management Centre
TVS	Tunnel Ventilation Station
WHT	Western Harbour Tunnel



CONTENTS

1. Introduction	1
1.1 Purpose and Scope of this Plan	1
1.2 Associated Documents	1
1.3 Relationship to Other Plans	2
2. Emergency Response	2
2.1 Responsibilities	2
2.2 Incident Notification – Internal	3
2.3 Incident Notification - External	3
3. Pollution Incident Prevention	4
3.1 Risk Scenarios	4
3.2 Prevention, Early Detection and Minimisation	6
3.2.1 Fire Detection Systems	6
3.2.2 Deluge Systems	6
3.2.3 SHT Drainage System	6
3.2.4 Contaminated Water Tank (CWT)	7
3.2.5 Interagency Agreements	7
3.2.6 Dangerous Goods Prohibition	7
3.2.7 Exhaust Ducting	7
3.2.8 Exhaust Fans	7
3.3 Inventory of Pollutants	7
3.4 Safety Equipment	8
4. Pollution Incident Response	8
4.1 Minimising Harm to Persons on the Premises	8
4.2 Incident Response Actions	8
4.2.1 Immediate Response Procedures	8
4.2.2 First Response	8
4.2.3 Pollution Incident Clean-up	8
5. Training and Testing	9
5.1 Training	9
5.2 Testing	9
5.2.1 Inductions	9
5.2.2 Training and simulation exercises	9
5.2.3 Emergency exercises	9
5.2.4 Practice drills, emergencies and debriefs	9
Appendix 1 SITE DETAILS	0
A1. Site Description	0
A2. Site Figures	1



1. INTRODUCTION

Ventia was awarded the Asset Management Services Contract (the Contract) for the Sydney Harbour Tunnel (SHT), with a base contract of an initial fifteen-year term with two ten-year extension options. Under the Contract, Ventia will provide Asset Management (AM), Operations and Maintenance (O&M) and lifecycle refurbishment services for the SHT.

The SHT is currently one of only two primary harbour crossings connecting to the Warringah Freeway in the north and the Domain Tunnel (DT) / Eastern Distributor in the south.

As a part of the AM Services, an Operations Environmental Management Plan (OEMP) has been prepared for the management of environmental impacts and risks of the AM Services. This Pollution Incident Response Management Sub-Plan (PIRMSP; this Sub-Plan) constitutes a part of the OEMP.

This Sub-Plan applies to all personnel working on the Contract, as well as visitors and contractors to the SHT and associated premises. It is maintained at SHT premises and made readily available to persons responsible for its implementation and to authorised EPA officers on request.

1.1 Purpose and Scope of this Plan

The PIRMSP details responsibilities and specific requirements in relation to notifying, responding to and managing pollution incidents as these are defined in the *Protection of the Environment Operations Act 1997* NSW (POEO Act). The PIRMSP describes potential hazards to human health and the environment associated with Contract activities and identifies pre-emptive and responsive actions and responsibilities to minimise hazards.

1.2 Purpose and Scope of this Plan

SHT operations are classified as a 'Scheduled Activity' as per the POEO Act. Consequently, operational activities are undertaken consistent with the requirements of Environment Protection Licence Number 4062 (EPL) issued by the NSW Environmental Protection Agency (EPA) for SHT activities.

Condition 6-R1.1(5) of the EPL requires the preparation of a 'Pollution Incident Response Management Plan'. This requirement complies with Part 5.7A – Clause 158A of the POEO Act. Chapter 4 – Clause 72 of Protection of Environment Operations (General) Regulations 2022 details additional matters to be included in the PIRMP considering requirements of Part 5.7A – Clause 153C of the POEO Act. Part 5.7, Section 147 of the POEO Act details the duty to notify in the event of a pollution incident causing or threatening to cause material harm to the environment. The POEO Act defines material harm to the environment as 'harm to the environment' if:

- It involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or
- 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
- 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.

Note: Notification is required even where 'harm to the environment is caused only in the premises where the pollution incident occurs'.

This Sub-Plan achieves compliance by:

- Identifying and documenting pollutants and relevant hazards along with likelihood of occurrence
- Describing planned pre-emptive and harm-minimisation actions and equipment in place
- Recording contact details of all relevant, responsible authorities
- Recording the Sub-Plan testing and training details.

1.3 Associated Documents

This Plan is to be read in conjunction with the:

- Operations Plan
- Emergency Management Sub-Plan



- Incident Response Manual
- Critical Control Checks Form
- Operations Environmental Management Plan
- Environmental Policy
- Risk and Opportunities Register
- Environmental Aspect and Impact Register.

1.4 Relationship to Other Plans

Within Ventia’s Integrated Contract Management System (ICMS), this Sub-Plan is part of the Performance and Assurance suite of plans, which are in turn sub-plans to the overarching Contract Management Plan, as illustrated at Figure 1.

Note: Figure 1 contains inaccuracies and is to be updated definitively at the conclusion of the review process.

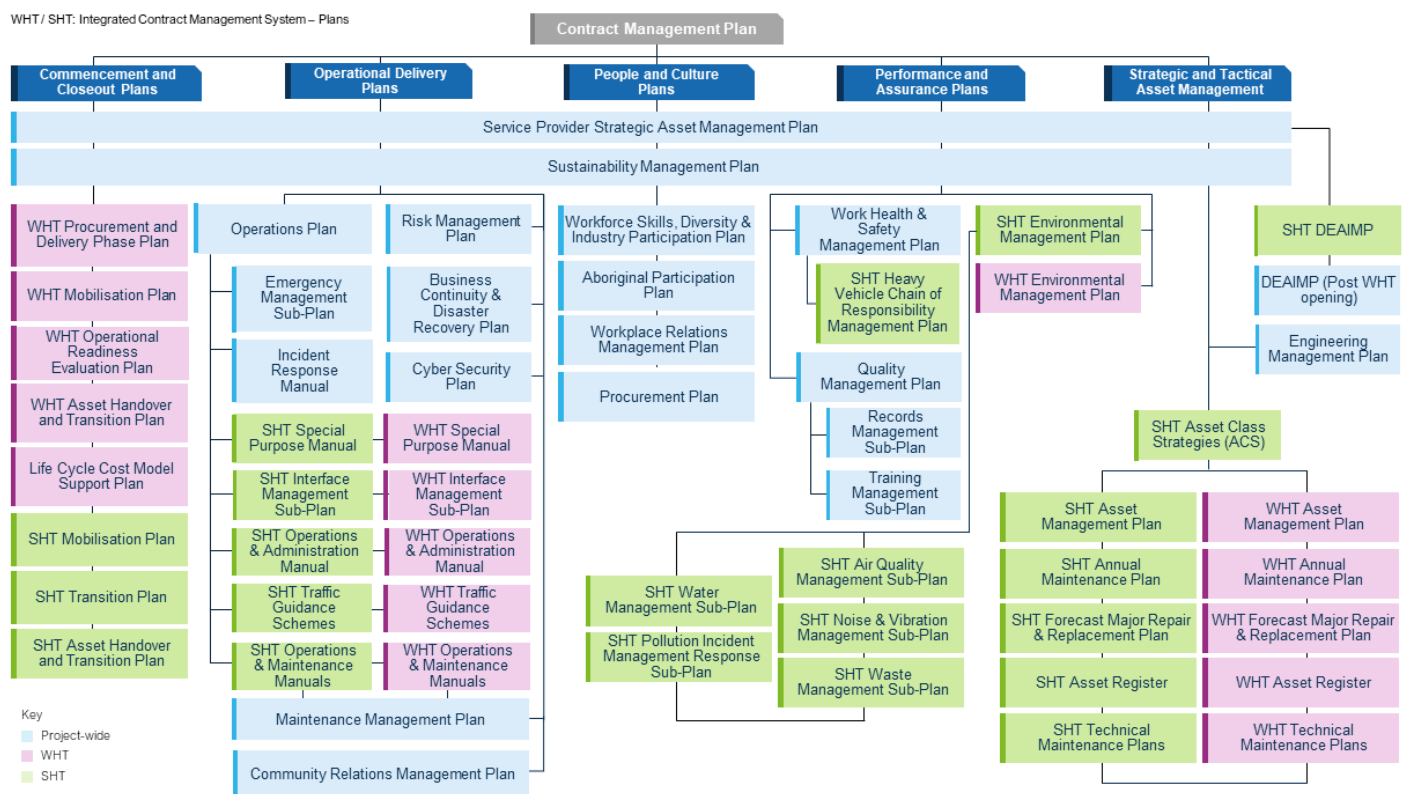


FIGURE 1: INTEGRATED CONTRACT MANAGEMENT SYSTEM PLANS

2. EMERGENCY RESPONSE

2.1 Responsibilities

The SHT Emergency Management Sub Plan (EMSP) provides detailed emergency response procedures, including the roles and responsibilities held during an emergency event, which includes pollution incidents. An overview of responsibilities is presented in Table 2.

TABLE 2: OVERVIEW OF EMSP RESPONSIBILITIES

Role	Responsibilities
Operations Manager/Duty Manager	<ul style="list-style-type: none"> • Notify all required regulatory authorities immediately in accordance with this plan • Implement emergency response measures in accordance with the appropriate procedures. • Initiate and maintain communication with emergency services and other external stakeholders relevant to the management of any emergency.



Tunnel Control Room Operators	<ul style="list-style-type: none"> Assist the Tunnel Controller in implementing emergency response measures in accordance with the appropriate procedures.
SHT Manager	<ul style="list-style-type: none"> Undertake the incident investigation in consultation with individuals / agencies involved in the incident response. Notify stakeholders of an actual pollution incident within 24 hours of the incident occurring.
WHT/SHT Network Manager	<ul style="list-style-type: none"> Ensure adequate resources are made available for the implementation of this plan
All Staff	<ul style="list-style-type: none"> Notify the Tunnel Controller immediately of any actual or potential pollution incident.

2.2 Incident Notification – Internal

Any Ventia personnel who discovers an actual or potential pollution incident is responsible for immediately notifying the Operations Manager/Duty Manager of the incident and providing the following information:

- The time, date, nature, duration and location of the incident
- The location where pollution is occurring or is likely to occur
- The nature, estimated quantity or volume and concentration of any pollutants involved, if known
- The circumstances in which the incident occurred (including the cause of the incident, if known)
- The action taken or proposed to be taken to deal with the incident and any resulting pollution or threatened pollution, if known.

Internal emergency contact details are provided in Table 3.

TABLE 3 INTERNAL INCIDENT NOTIFICATION CONTACTS

Contact Name	Contact Name	24-hour Contact Number
WHT/SHT Network Manager	Anthony Curry	0427 378 544
SHT Manager	Greg Pipikios	0404 240 993
WHS Manager	Nathan Ross	0458 519 544
Sustainability & Environmental Manager	Tete Awotedu	0408 939 252
Operations Manager	Andrew Rutter	0488 774 759
Maintenance Manager	Jason Quarta	0416 062 061
Tunnel Control Room	NA	9959 8115

2.3 Incident Notification - External

The Operations Manager/Duty Manager is responsible for notifying all required regulatory authorities immediately and supplying the following information:

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

Lack of any of the above information should not prevent the Operations Manager/Duty Manager from making an immediate notification. As additional information becomes available, it should be communicated with all the relevant agencies immediately.

Contact details for regulatory authorities as per Table 4 are recorded in the Tunnel Control Room (TCR).

TABLE 4 EXTERNAL INCIDENT NOTIFICATION CONTACTS

Contact Name	24-hour Contact Number	Contact Name	24-hour Contact Number
Fire and Rescue NSW	000	NSW Ministry of Health	(02) 9391 9000
NSW EPA	131 555	North Sydney Council	(02) 9936 8100 (LEMO)
SafeWork	131 050	City of Sydney Council	(02) 9265 9333 (LEMO)



3. POLLUTION INCIDENT PREVENTION

This section provides details on pollution-incident risk scenarios associated with SHT operations, and details on pre-emptive measures to prevent pollution incidents.

3.1 Risk Scenarios

A desktop risk assessment was undertaken with key SHT staff to identify the main hazards associated with SHT operations that pose a risk of causing actual or potential material harm to the environment. According to the Ventia Safety, Health, Environment and Quality (SHEQ) risk assessment process, the overall risk rating for each potential pollution incident scenario is expressed in ranges from low to very high, and is a product of likelihood and consequence:

- The Likelihood that the impact will occur, considering the probability of the risk scenario occurring, or by assessing the risk scenario in a historical context. Likelihood ranges from rare (less than 5%) to almost certain (more than 75%)
- The Consequence of the impact, considering the probable impact upon the environment, or by assessing the risk scenario in a historical context. Consequence ranges from negligible to substantial.

The risk matrix adopted for this Sub-Plan is provided at Figure 2, while the main hazards identified in this Sub-Plan’s risk assessment are detailed in Table 5, overleaf.

		CONSEQUENCE				
		NEGLIGIBLE	MINOR	MODERATE	MAJOR	SUBSTANTIAL
LIKELIHOOD	ALMOST CERTAIN >75%	LOW	MODERATE	HIGH	VERY HIGH	VERY HIGH
	LIKELY 51% -75%	LOW	MODERATE	HIGH	HIGH	VERY HIGH
	POSSIBLE 26% - 50%	LOW	MODERATE	MODERATE	HIGH	HIGH
	UNLIKELY 5% TO 25%	LOW	LOW	MODERATE	MODERATE	HIGH
	RARE <5%	LOW	LOW	LOW	MODERATE	MODERATE

FIGURE 2: RISK MATRIX



TABLE 5: SUMMARY OF IDENTIFIED HAZARDS

Hazard	Description	Consequence	Risk Rating	Management Measure
Fire in tunnel	Fire in the tunnel arising from multiple scenarios, i.e. vehicle accident, spill of chemicals and ignition.	Release of potential / actual contaminated water to Sydney Harbour.	Low	<ul style="list-style-type: none"> Fire prevention measures – Dangerous Goods (DG) transport restrictions, fire detection systems, continuous surveillance of tunnel Holding capacity of tunnel drainage system include 2 x 25,000L waste sumps, 35,000L contaminated water holding tank and capacity within the SHT pipework At 10% capacity of the Contaminated Water Tank (CWT), a liquid waste truck is called in to pump out contaminated water tank to licensed waste facility Sydney Ports Authority pollution response team is contacted to deploy booms around discharge point if required Regular emergency response training undertaken including operation of the deluge system and interactions with Emergency Services Recorded low fire-incident rate in the SHT (2 fires in the tunnel requiring use of the deluge system, which did not result in a significant rise of the CWT level).
Fire in tunnel	Smoke generated from the fire is released from the tunnel via exhaust fans.	Release of potential / actual harmful air emissions to the local area.	Low	<ul style="list-style-type: none"> Ventilation systems discharge and portal emissions from the top of the north pylon under normal and emergency conditions Reversal of supply fans near Olympic Drive to release smoke is possible but is not typically required Reversal of supply fans triggers automatic warning alarm and recorded message at discharge site.
Restrictions to incident response	Emergency event in Tunnel Administration and Control Facility (TACF) (e.g. fire) prevents operation of control room	Uncontrolled operation of the SHT and potential unmanaged spill events.	Low	<ul style="list-style-type: none"> If TACF is unable to be occupied, Emergency Procedures require shut down of the SHT (including by Traffic Management Centre [TMC]) Operations are to be relocated to the secondary control room, the Disaster Recovery Site (DRS) located at the Tunnel Ventilation System Room Once the DRS is operational, the SHT can be reopened.
Chemical / fuel spill in tunnel	Significant spill of dangerous goods from transport vehicles operating illegally in tunnel	Release of dangerous goods / contaminated water to Sydney Harbour.	Low	<ul style="list-style-type: none"> DG transport is prohibited from the SHT Typical road tanker volume is less than the total holding capacity of the SHT drainage system At 10% capacity of the CWT, a liquid waste truck is called in to pump out contaminated water to licensed waste facility Sydney Ports Authority pollution response team is contacted to deploy booms around discharge point if required Regular emergency response training undertaken including operation of the deluge system and interactions with Emergency Services.
Chemical / fuel spill in tunnel	Spill of fuels / oils resulting from vehicle accident / breakdown	Release of dangerous goods / contaminated water to Sydney Harbour.	Low	<ul style="list-style-type: none"> Volume of fuel / oil held by vehicles for operation comparatively small in relation to SHT drainage holding capacity.



Hazard	Description	Consequence	Risk Rating	Management Measure
Spill / leak of stored chemicals / dangerous goods	Stored chemicals (caustic soda, chloride) spilt or leaked during normal operations	Release of dangerous goods / chemicals to drainage system	Low	<ul style="list-style-type: none"> Minimal volume of DG / chemicals stored for normal operations Storage locations have a closed drainage system with capacity in excess of maximum possible spill volume Manual pump out of spills / leaks undertaken to prevent contribution to drainage system.
Health risk to surrounding community	A pollution incident potentially impacts upon surrounding residents, businesses, and local area users (pedestrians, water traffic)	Negative health outcomes for affected persons	Low	<ul style="list-style-type: none"> Pre-emptive measures reduce likelihood of pollution event Tunnel operations stopped during an emergency event Agreement with TfNSW: TfNSW to manage Emergency Services role include controlling site access.

3.2 Prevention, Early Detection and Minimisation

The operation of the SHT includes a number of preventative and pre-emptive actions to mitigate the impacts of potential pollution incidents.

3.2.1 Fire Detection Systems

Fires are detected through observation via CCTV from the TCR and through advice from motorists to the TCR. Thermal sensors are installed every 15 metres above each traffic lane in the tunnel, which are also monitored from the TCR.

Other fire detection systems including thermal detectors, smoke detectors, flame detection systems, beam detection and break glass alarms are installed in ancillary facilities. These systems, if activated, are automatically relayed to the Fire Brigade.

3.2.2 Deluge Systems

A water deluge system is installed in the tunnel ceiling of each carriageway. Discharge heads are grouped into 30-metre zones, and any two zones can be operated simultaneously without reduction in water pressure or flow.

The water deluge system is activated in the following scenarios as determined by the Tunnel Controller:

- The fire is not being contained
- Opportunities exist for the fire to spread
- No attempt is being made to otherwise contain the fire
- Vision of the fire and assessment of its status is hindered by smoke.

Following arrival of the fire brigade, all decisions regarding operation of the deluge system will be made by the senior Fire Brigade Officer in attendance.

3.2.3 SHT Drainage System

Under normal operation, stormwater entering the tunnel is:



- Collected by the SHT drainage system
- Monitored for pH
- Directed to a waste tank (two tanks available, each with 25,000L capacity)
- Discharged to Sydney Water sewer via an oily water separator.

3.2.4 Contaminated Water Tank (CWT)

During upset conditions such as a chemical spill or deluge (required to manage tunnel fires), or where there is waste generated from the response to a fire, wastewater from the SHT drainage system is directed to the CWT either:

- Manually by the Tunnel Controller
- Automatically upon detection of pH outside the normal operating range of the wastewater.

The capacity of the CWT is 35,000L. When the CWT reaches 10% capacity, an automatic alarm is triggered in the TCR. The Tunnel Controller responds by contacting the nominated waste transport contractor to pump out the tank and dispose of the wastewater to an appropriately licenced waste facility. The Tunnel Controller will also notify Sydney Port Authority when the CWT reaches 10% capacity to establish pollution control measures at the Sydney Harbour discharge point.

In an extreme event where the capacity of the CWT may be exceeded, the TCR has the functionality to utilise spare capacity in the waste tank (an additional 25,000L) before overflow is discharged to Sydney Harbour. The overflow to Sydney harbour would be via a pipe on the western side of the tunnel near Olympic Drive. In the life of the SHT, the overflow discharge has not been triggered.

3.2.5 Interagency Agreements

Ventia has the following agreements with other agencies to assist in the management of traffic or emergency incidents:

- TfNSW sub-contractors (Drivers Aid) respond to all tunnel incidents, which includes removing vehicles and or other obstructions from the tunnel, and the post incident site clean-up.
- Sydney Port Authority responds to potential or actual pollution events in Sydney Harbour. Ventia notified Sydney Port Authority of the nature of potential pollution incidents arising from a SHT emergency.

3.2.6 Dangerous Goods Prohibition

The transport of dangerous goods through the SHT is prohibited. This significantly reduces, though not eliminates, the likelihood of an incident involving dangerous goods from occurring.

3.2.7 Exhaust Ducting

Tunnel air is exhausted through ducting to the top of the north pylon, which is approximately 90m above ground level. In the event of a fire, smoke can be exhausted through this ducting.

There are no automatic warning systems in place for exhausting as it is part of normal operations, and the immediate area is off-limits to the general public.

3.2.8 Exhaust Fans

Supply fans located adjacent to Olympic Drive can be reversed to exhaust air emissions from the tunnel, which may be required in the event of a fire or fuel / chemical spill. In the event that the exhaust fans are activated, a warning siren is automatically activated and audio message played to advise pedestrians that exhaust air from the Tunnel will be discharged in the immediate vicinity. The Operations Manager/Duty Manager also coordinates with Emergency Services to arrange site protection measures, i.e. Police officers stationed around the fans to direct pedestrians.

The reversal of supply fans has not been used except for training purposes. In the event of an emergency generating smoke, it is preferable for smoke to be exhausted through the north pylon and / or portals.

3.3 Inventory of Pollutants

Normal operations of the SHT do not require significant volumes of potential pollutants to be held on site. A list of potential pollutants is detailed in Table 6.



TABLE 6: POLLUTANT INVENTORY

Area	Pollutants	Max Quantity
Groundwater Treatment Plant	Caustic Soda	500L (10% diluted)
Chemical Dosing Room	Chlorine	120L (50% diluted)

3.4 Safety Equipment

As the response to an emergency is controlled by Emergency Services, safety equipment present at site is limited to personal protection equipment and minor emergency response equipment. Site vehicles are fitted with small fire extinguishers and spill response equipment, and fire extinguishers / hose reels are placed throughout the SHT and ancillary facilities.

4. POLLUTION INCIDENT RESPONSE

This section details management measures for minimising the risk of harm to site personnel and the public during a pollution incident and the actions to be taken during and immediately after a pollution incident.

4.1 Minimising Harm to Persons on the Premises

Evacuation of motorists may be necessary following major incidents where it is not possible or safe for vehicles to continue to drive out of the tunnel, which will be closed to traffic in the event of a site evacuation.

The Incident Response Manual containing the Standard Operating Procedure SHT-IRM-03 Emergency Evacuation details the procedure for evacuating the tunnel.

4.2 Incident Response Actions

4.2.1 Immediate Response Procedures

The Incident Response Manual includes a range of procedures and information on the management of emergencies in the SHT, including:

- Fire in Tunnel
- Fire in the TACF
- Fire in ancillary structures
- Fire in tunnel distribution board or control niche
- Fuel or chemical spill
- Tunnel evacuation
- Flooding of tunnel.

For each procedure, the Operations Manager/Duty Manager is responsible for managing the incident response process, including containing the incident, notifying emergency services and regulatory authorities, and communicating with SHT users and other potentially affected parties.

4.2.2 First Response

The Operations Manager/Duty Manager will direct any actions taken to quickly contain any spill, providing that conditions are safe to do so. Any spills in the SHT will be managed by the recovery vehicle crew within their capabilities. When the spill involves a suspected hazardous chemical, a large amount of fuel, or there is a risk the substance may ignite or explode, the Operations Manager/Duty Manager will call Fire and Rescue NSW immediately.

4.2.3 Pollution Incident Clean-up

The methodology for the clean-up of pollution incidents will largely depend on the type and extent of the pollution incident.

Within the tunnel, clean-up methodology will consider the following:

- Type of pollutant
- Extent/area of pollution
- Medium in which pollution has occurred (land, air, water)
- Requirements for specialist advice in relation to the removal and remediation of the pollution



- Potential additional environmental impacts by the proposed clean-up processes
- Costs to remove the polluted material to a waste facility licensed to accept the waste.

TfNSW, in addition to responding to any incident occurring in the SHT, is also responsible for the post-incident clean-up. Typically, this would involve the placement of absorbent material on the road surface to capture pollutants, and use of a street sweeper to collect the contaminated material.

If the Operations Manager/Duty Manager determines that a discharge from the CWT is likely, the Operations Manager/Duty Manager will notify Sydney Port Authority to arrange any booms and clean-up devices that may be necessary.

5. TRAINING AND TESTING

5.1 Training

All SHT Tunnel Controllers complete a Certificate IV in Traffic Operations (TLI42513). Key modules that relate to the implementation of this Plan include:

- Equipment checking and maintenance (check and assess operational capabilities)
- Communication (use electronic communication systems)
- Safety management (coordinate breakdowns and emergencies).

The Operations Manager/Duty Manager is tested every six months in Emergency Procedures. All responsible personnel within this plan will be inducted into this plan within one month of implementation or change.

5.2 Testing

Ventia tests this plan on a routine basis at least once every 12 months and within one month after a notifiable incident. Testing of the PIRMSP runs in conjunction with testing of the overall EMSP and includes training and simulation exercises, emergency exercises, practice drills, emergencies and debriefs. Practices are described in brief here; for further detail see Section 7 and Section 8 of the EMSP.

5.2.1 Inductions

All personnel, including team members, subcontractors, and visitors, will receive an appropriate induction (including SHEQ requirements) before they commence work. This induction will include staff role and responsibilities with regards to implementation of this PIRMP.

5.2.2 Training and simulation exercises

Traffic Control Room Operators (TCROs) and Maintenance Teams (MTs) take part in regular exercises and workshops where they rehearse responding to an Incident or emergency. Workshops and field simulation exercises, carried out during maintenance closures, are held as required by TfNSW and as part of the training schedule. Desktop exercises, typically involving the Emergency Services, are conducted annually.

5.2.3 Emergency exercises

SHT emergency exercises, workshops and reviews consider the interaction of other agencies and Stakeholders. During the exercises, the TCROs assist Emergency Services and the Traffic Management Centre (TMC) to tailor their operating procedures to the specific requirements and layout of the SHT via the Special Purposes Manual.

Devices tested during emergency exercises with Emergency Services may include:

- Smoke Extraction
- Deluge
- Systems Operating in Evacuation
- Ventilation and Air Quality Monitoring
- Traffic Management Plan

5.2.4 Practice drills, emergencies and debriefs

To test the effectiveness of the project's emergency arrangements, emergency practice drills are conducted:

- At a minimum annually



- Whenever there is a significant change to site activities or conditions
- As determined by a risk assessment.

Lessons learned during actual emergencies or through training and exercising must be fed back into the Plan as appropriate. Debriefs are conducted after each Incident or exercise to identify any positive or negative feedback of the critical infrastructure, Asset, organisations and/or plans and procedures which may have impacted on the response, recovery aspects and overall outcome.

The debriefs should identify:

- Whether the exercise has achieved its aims and objectives
- Requires improvements in security and emergency management, procedures, manuals, plans or guidelines
- Requires improvements in the management of infrastructure and associated systems
- Training and staffing deficiencies
- Any need for continued exercising of plans, procedures and the emergency management function.



APPENDIX 1 SITE DETAILS

The following site details are provided to support the pre-emptive and response actions described in this Sub-Plan, including Emergency Tunnel Closures. The Site Description is complemented by site visuals at Figure 3 and Figure 4.

A1. SITE DESCRIPTION

The SHT is approximately 2.3 kilometres in length and features two carriageways, each carrying two lanes of unidirectional traffic. The northern portals are located on the Warringah Expressway near High Street and the southern portals connect with the Cahill Expressway north of the Domain tunnel. Facilities associated with the tunnel include:

- Tunnel Administration and Control Facility (TACF)
- Tunnel Ventilation Station (TVS)
- Pylon Ventilation Station (PVS)
- North and South Portal Switch Rooms
- Valve Houses.



A2. SITE FIGURES

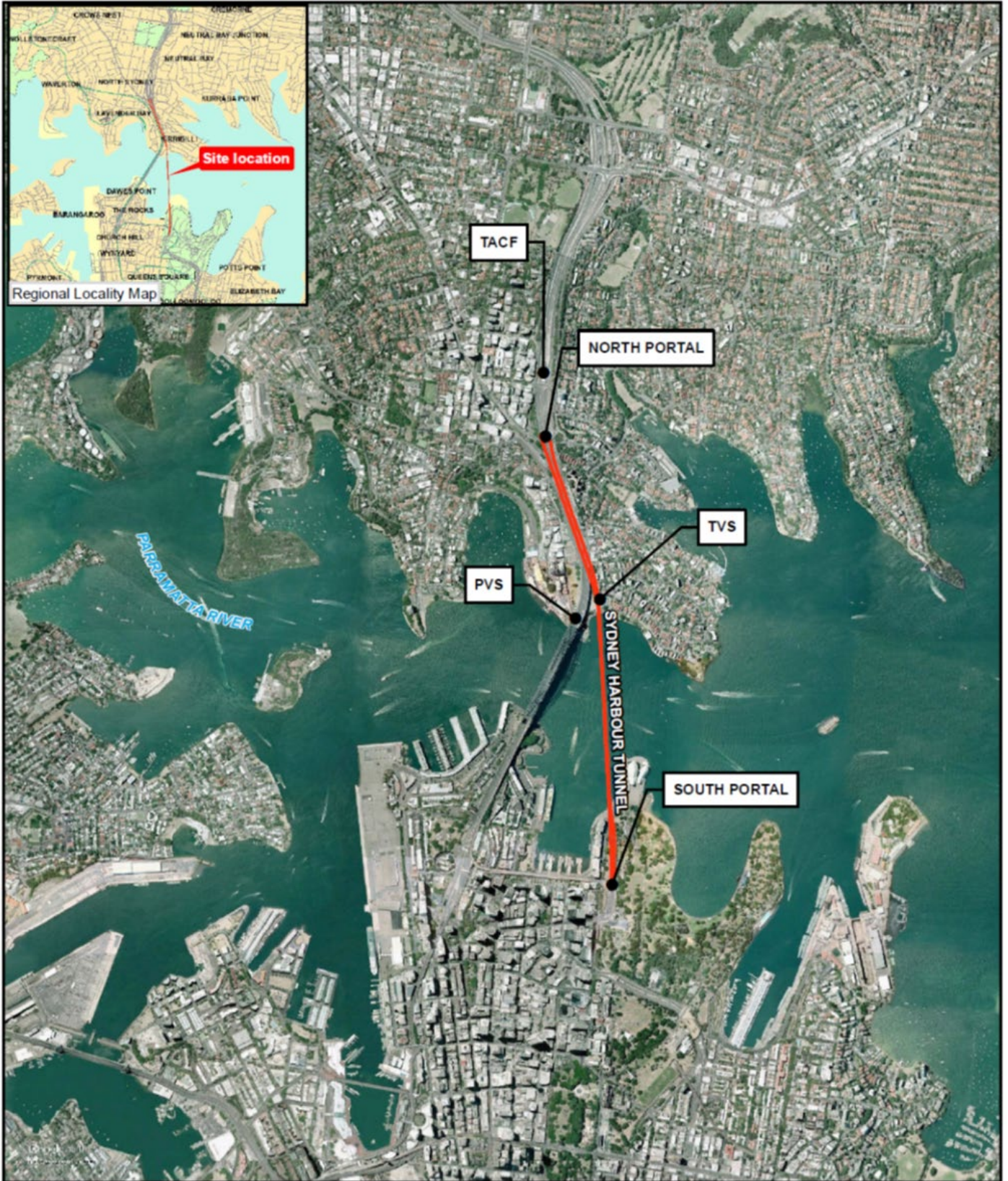


FIGURE 34: SHT NORTH PORTAL, SOUTH PORTAL, TACF, TVS AND PVS

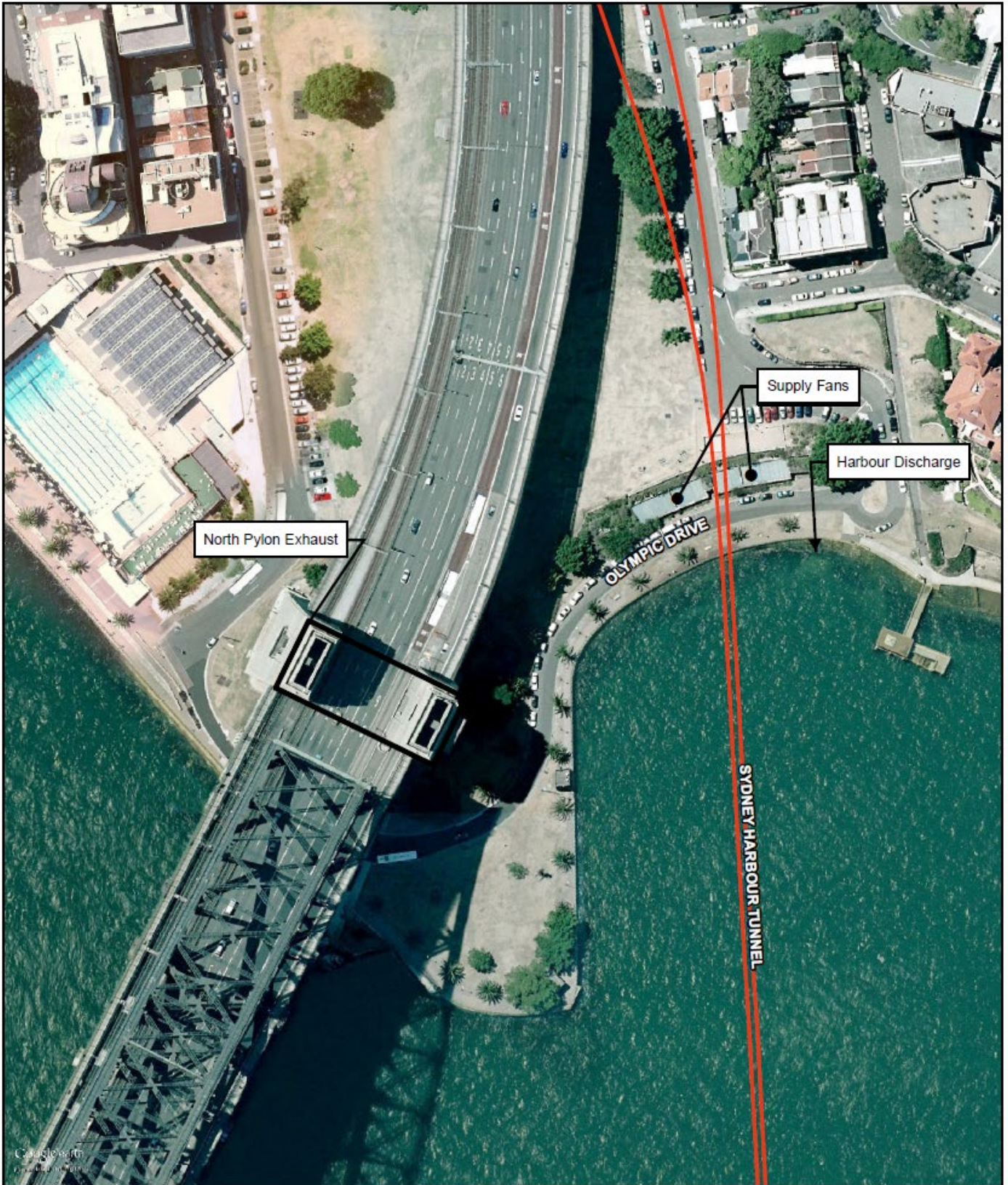


FIGURE 5: SHT NORTH PORTAL EXHAUST, SUPPLY FANS AND HARBOUR DISCHARGE