Version: 2023.4
(23 June 2023)

UNDERGROUND PETROLEUM **STORAGE SYSTEMS**

QUICK REFERENCE GUIDE

A GUIDE FOR RETAIL FUEL SERVICE STATION OWNERS ON MANAGING UPSS SYSTEMS

PREPARED BY:

Riverina and Murray Joint Organisation
Riverina Eastern Regional Organisation of Councils
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Dubbo Regional Council
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- How can you prevent leaks and spills?
- What if there is an accident?
- How should you prepare?

ACKNOWLEDGEMENTS

This guide is an update of the NSW EPA's "UPSS – best practice guide for environmental incident prevention and management" flipchart (NSW EPA, 2016). This flipchart was retired by NSW EPA in 2019.

Amendments and updates were applied by RAMJO, REROC, FNWJO and Dubbo Regional Council. These were identified by Golder and Associates, drawing on the following resources:

- UPSS Regulation 2019,
- NSW EPA Guidelines for implementing the UPSS Regulation 2019,
- NSW Environment Protection Authority's *Guidelines for implementing the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019 (the UPSS Guideline)*, and
- EPA VIC Publication 1670: *Victorian underground petroleum storage systems: A guide to preventing and managing leaks and spills* produced by the Victorian Environment Protection Authority (EPA VIC).

This guide is one of a series of best practice resources developed on contaminated land and UPSS infrastructure. These resources were developed with use of funds under the NSW EPA Council Regional Capacity Building (CRCB) program on Contaminated Land.

The process of developing these resources was a collaboration between the respective CRCB projects delivered by Riverina and Murray Joint Organisation (RAMJO), Riverina Eastern Regional Organisation of Councils (REROC), Northern Rivers Contaminated Land Program, Far North West Joint Organisation (FNWJO) and the Dubbo Regional Council.

LIMITATIONS

The following limitations are to be noted in relation to this resource:

- Legislative framework is the framework of 23 June 2023
- NSW EPA and other statutory and non-statutory guidelines, technical notes and related resources are of 23 June 2023.

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AIM

Retail fuel service stations provide a critical service to communities across NSW as fuel (and gas) are essential for local economies and the mobility of its residents. It is important that the operation and maintenance of these sites benefit the community, while also minimizing the risk of harm to human health and the environment.

This 'quick reference guide' ('guide') is intended to be a resource for all retail fuel service station operators to draw on in managing risks associated with the operation of UPSS systems. It has a specific focus on best practice operational measures to minimize the risk of harm, as well as best practice guidance on how to respond and manage a leak or spill.

It is acknowledged most sites are operating under the banner of an established fuel company and will already have detailed procedures in place for this. Hence the intent of this guide is to ensure that the smaller independent service station operators have a practical and instructional resource to use if they are required to address an environmental incident.

INTRODUCTION

Most sites in New South Wales (NSW) with underground petroleum storage systems ('UPSS') are regulated under the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019 (the 'UPSS Regulation'). The UPSS Regulation aims to prevent pollution through good practice design, installation, operation and maintenance of UPSS infrastructure.

NSW Councils are the Appropriate Regulatory Authority ('ARA') with the responsibility to work closely with retail fuel service station operators to ensure the operation of UPSS infrastructure maintains compliance with the UPSS Regulation. Complying with this Regulation through good practice leak detection and loss monitoring will also minimize the risk of harm UPSS infrastructure can pose to human health, the environment and property.

Service station sites are also regulated by SafeWork NSW, albeit in the context of workplace health and safety. Hence councils and SafeWork NSW are both working closely with service station operators on the operation of these sites.

UPSS tanks have a high propensity to leak. This is largely attributable to older steel tanks that under certain conditions can corrode and result in leaks into the soil and groundwater. Hence the age of tanks as well as soil characteristics and groundwater depth are contributing factors to the potential of risk of harm. The UPSS Regulation seeks to mitigate this potential risk through good practice design and installation, and good practice loss monitoring and leak detection procedures.

Spillage is a frequent occurrence at service station sites and is often a result of people making mistakes or being careless, particularly at the bowser. Spillage can also occur elsewhere on the site and can be an indicator of a failure in the UPSS system. Such system failures should be detected, managed and investigated early as fuel spills cost money, and importantly poses a potential risk of harm.

Good practice forecourt design and stormwater management and treatment can minimize the risk of harm from surface water pollution in nearby creeks, rivers and waterways.

Above all, frequent loss monitoring (monthly) and leak detection (twice a year) procedures are key to the ability to identify and manage the cause of leakages and spillage. These are described in some detail in this guide. This guide also provides best practice environmental incident prevention and response management measures for service station sites.

Implementing measures designed to prevent the cause of leakages and spillage may help service station site owners and/or operators to save money and manage legal responsibilities. Leaks and spills don't just hurt the environment; they can come at the cost of lost stock and expensive cleanup bills.

GLOSSARY

ARA – Appropriate Regulatory Authority
this is the authority that regulates certain activities and will be identified in the relevant legislation. For activities associated with UPSS, the ARA is usually either the EPA or council.

EIT – Equipment Integrity Test
must be conducted by a suitably qualified person and be accompanied by a certificate and test results.

Interstitial monitoring
A type of leak monitoring used for detecting leaks in the annular/interstitial space of a double wall underground tank.

Loss detection
Procedures and processes able to identify the cause of a discrepancy (loss) from any part of a UPSS (i.e. a leak from tanks and/or pipework).

Loss monitoring procedure
One or more procedures for undertaking inventory control (reconciliation) of the petroleum in a system to identify a discrepancy in the volume of petrol (either loss or gain) and the means to record the results and trigger the need for any further action.

NATA – National Association of Testing Authorities.
NATA is the authority responsible for the accreditation of laboratories throughout Australia.

POEO Act
Protection of the Environment Operations Act 1997.

SIRA
Statistical Inventory Reconciliation Analysis – A third party statistical assessment of inventory (volumetric) data (i.e. delivery, dispensing and retention volumes), which may be compensated (adjusted), as appropriate, to determine if a discrepancy in inventory control can be identified.

Suitably qualified person
A person who has the relevant academic/technical qualification and practical experience to undertake work in a safe and effective manner, such as a contaminated land consultant (who will need appropriate tertiary qualifications and field experience). The consultant ideally would be a certified environmental practitioner under a contaminated land practitioner's scheme.

UPSS
Underground Petroleum Storage Systems.

UPSS Regulation
Protection of the Environment (Underground Petroleum Storage Systems) UPSS Regulation 2019.

WHS Regulation
The Work Health and Safety Regulation 2017.

CONTACTS

Hazardous chemical and tank removal and abandonment advice

Safe Work NSW | **131 050** | safework.nsw.gov.au

Underground Petroleum Storage System (UPSS) regulation information

YOUR LOCAL COUNCIL
Contact information from your Local Council website

Hazardous chemicals manifest advice

Fire and Rescue NSW | fire.nsw.gov.au | firesafety@fire.nsw.gov.au

General advice on spill prevention

Your local council Environmental Health Section

Phone: _____

Spill kit suppliers

Search **'chemical spill kits'** or **'fuel spill kits'**

Assistance for UPSS operators

Search **'NSW Petroleum associations'** or contact your Local Council

INCIDENT RESPONSE CONTACT INFORMATION:

- Fire and Rescue **000**
- EPA **131 555**
- SafeWork NSW **131 050**
- Local Council

PH:

- Local NSW Health District

PH:

Where a leak or spill is causing or likely to cause material harm to the environment or human health, the person responsible must notify the relevant authorities as soon as practicable. Failure to report such pollution incidents is an offence under Part 5.7 of the *POEO Act*.

Relevant authorities include EPA, Council, SafeWork NSW, Fire Rescue NSW, Rural Fire Service and NSW Health.

The Protection of the *Environment Operations Act 1997* (the 'POEO Act') is the primary legislation used to prevent and regulate pollution in NSW. Under the Act, it is an offence to pollute land and waters, including groundwater.

The *UPSS Regulation* has been made under the *POEO Act* to ensure that all underground petroleum storage systems are managed adequately.

UPSS operators can report pollution incidents under Part 5.7 of the *POEO Act* using the provided 'leak notification form'

OPERATIONAL UPSS SITES ARE OBLIGED TO HAVE THE FOLLOWING INFORMATION AVAILABLE:

- Fuel System Operation Plan (FSOP) or equivalent documents. The *UPSS Regulation* requires that the (FSOP) or equivalent documents must be kept up to date, be accessible to all operational personnel involved with fuel management and dispensing.
- Loss monitoring procedure.
- Leak detection procedure.
- Incident management procedure.
- Site plan, including drainage and services (overleaf).
- Hazardous Chemicals Manifest – for use by emergency services during incidents.
- Spill kits for all chemicals stored onsite including fuel.

IT IS A LEGAL REQUIREMENT TO REPORT POLLUTION INCIDENTS, IN AN EMERGENCY CALL 000 OR CONTACT YOUR LOCAL COUNCIL

Significant system modifications, replacement, decommissioning and validation results must be reported to council. You must engage a suitably qualified person to carry out these works. Contact your local council for information on development applications, reporting, contaminated land policy and remediation notification requirements.

OTHER RELEVANT LEGISLATION AND AUSTRALIAN STANDARDS INCLUDE:

Contaminated Land Management Act 1997

Work Health and Safety Regulation 2017

The Design Installation and Operation of Underground Petroleum Storage Systems AS 4897 – 2008

Pipelines – Gas and Liquid Petroleum – General Requirements AS 2885.0 – 2008

Pipelines – Gas and Liquid Petroleum – Design and Construction AS 2885.1 – 2012

Pipelines – Gas and Liquid Petroleum – Operation and Maintenance AS 2885.2 – 2012

The Control of Undesirable Static Electricity AS /NZS 1020 – 1995

The Storage and Handling of Flammable Combustible Liquids AS 1940 – 2004

Steel Tanks for Flammable and Combustible Liquids AS 1692 – 2006

The Removal and Disposal of Underground Petroleum Storage Tanks AS 4976 – 2008

Petroleum Products – Pipeline, Road, Tanker Compartment and Underground Tank Identification AS 4977 – 2008

Explosive Atmospheres – Classification of areas – Explosive gas atmospheres AS/NZS 60079.10.1:2009

UPSS Regulation leak notification form

Note: This form may be downloaded from www.environment.nsw.gov.au/upss.htm

UPSS Regulation Leak Notification

Notification under Part 5.7 of the *Protection of the Environment Operations Act 1997*

This form provides specific guidance for reporting pollution incidents where a leak from an underground petroleum storage system (UPSS) is identified. This form should be completed where one or more of the following scenarios applies to the UPSS site (tick where appropriate):

- ☐ **A leak from the UPSS is verified in accordance with Section 4.3 Loss Detection and Investigation or Section 4.4 Incident Management Procedures outlined in the UPSS Guidelines**
- ☐ **There is evidence on the site of free-phase hydrocarbons in surface water and/or groundwater**
- ☐ **There is evidence that offsite migration of hydrocarbons could occur, is occurring, or has occurred.**

Note: *This form should be sent to the appropriate regulatory authority within 30 days of a pollution incident being detected by the person responsible for the UPSS.*

Section A: UPSS site details

Site name (or name of business):	**Local Government Area (Council):**
Nature of activity at the site:	**Lot and DP number:**
Street address:	
Environment Protection Licence number (if applicable):	
Dangerous Goods Licence/Notification Number (and date of expiry) (if applicable):	

Site characteristics (if known)

Site substrate type:	**Direction of groundwater flow:**
☐ Sand ☐ Silt ☐ Clay ☐ Rock ☐ Unknown ☐ Other (please specify)	**Depth to groundwater:**

Section B: Details of the incident *(Attach additional papers if necessary)*	
Date incident occurred or leak identified:	**Duration of incident (or date leak stopped):**
Nature of incident:	
Circumstances in which the incident occurred (including the cause of the incident, if known): ☐ Leaking tank ☐ Overfilling ☐ Other (please specify) ☐ Leaking piping ☐ Spill ☐ Structural failure ☐ Unknown	
Location of the incident (maps and/or diagrams may be included)**:**	
Location of any place where pollution is occurring or is likely to occur (maps and/or diagrams may be included)**:**	
What aspects of the environment are affected? (tick all that apply): ☐ Air ☐ Surface water ☐ Soil ☐ Other (please specify) ☐ Groundwater ☐ Stormwater ☐ Sediments	
Nature of any pollutants involved: ☐ Unleaded petrol ☐ Other, e.g. additives (please specify) ☐ Lead replacement ☐ Diesel ☐ Kerosene ☐ Waste oil	
Estimated quantity or volume of pollutants involved:	**Concentration of any pollutants involved:**

Action taken or proposed to be taken to deal with the incident and any resulting pollution or threatened pollution:
Any other relevant information (e.g. adjoining land uses, other possible source(s) of pollution)**:**

Section C: Person responsible for the UPSS site* *(refer to UPSS Regulation or see Section 1.6 of the UPSS Guidelines)*

** The person responsible is the person who has management and control of the system. If the 'person' responsible is a corporation, an individual who is authorised to act on the organisation's behalf must be nominated.*

Name:	**Phone no(s):**
Contact person (if person responsible is not a natural person):	**Address:**

Section D: Details of person who submitted notification

Name:	**Position:**
Address:	**Phone no(s):**
Signature:	**Date:**

If you fail to report a pollution incident which poses material harm to the environment as required under Part 5.7 of the* Protection of the Environment Operations Act 1997*, you commit an offence. The maximum penalty is $1,000,000 for corporations or $250,000 for individuals.	
A person is required to notify a pollution incident under Part 5.7 of the Act even though to do so might incriminate them or make them liable to a penalty. ***Any notification given by a person under Part 5.7 of the Act is not admissible in evidence against the person for an offence or for the imposition of a penalty.***	
Please send completed form to:	**A completed leak notification form is to be sent to your local council.** **It is important that this is provided to your local council as soon as possible to minimise increased risk of harm from the leak.**

OPERATIONAL UPSS REQUIREMENTS CHECKLIST

The *UPSS Regulation* requires all UPSS sites, including service stations, have a site-specific fuel system operation plan (FSOP) available at the site either as a hard copy or electronic version. The FSOP should document the site-specific management and configuration of the operational UPSS and provide details on maintenance requirements and procedures to be followed in an event of spill or fuel leak. The FSOP should include monitoring results, maintenance records, loss investigation records etc. A NSW EPA guidance document on UPSS storage system information[8] can help in the preparation of the FSOP.

Table 1: FSOP Checklist

FSOP COMPONENTS	REQUIREMENTS AND RECORD KEEPING	INCLUDED (Yes/No)
Site and contact details	The FSOP must include the following information: ☐ The name of the person responsible for the site, a 24-hour contact phone number and a contact address for that person provided ☐ If the site is owned by a corporation the details must be provided for a nominated person ☐ If the person responsible for the system is not the owner of the storage site, the name of the owner ☐ The street address of the site, ☐ The property identifier (i.e. Lot and deposited plan number(s)) ☐ Details of security of the site (e.g. locks, gates, fences) and how to access the site if it is secured ☐ The location of all records kept in accordance with parts 5 or 6 of the *UPSS Regulation*	
Loss monitoring system details	Details of the Loss Monitoring System must be included in the FSOP. This should include: ☐ Identification and qualifications of the designer of the Loss Management System ☐ A statement that the design is in accordance with EPA requirements ☐ The sensitivity of the system (minimum 0.76 L/hour required) ☐ Documented reconciliation process (manual dipping and/or automatic tank gauging) ☐ Monthly reviews ☐ Statistical Inventory Reconciliation Analysis	
Incident management procedure	The incident management procedure should include: ☐ Details of the actions to be taken if a leak or spill of fuel occurs ☐ Details of the actions to be taken if the Loss Monitoring System indicates the potential for a leak to be occurring ☐ Details of the actions to be taken if the Leak Detection System shows a leak has occurred	

[8] https://www.epa.nsw.gov.au/your-environment/contaminated-land/upss/fuel-system-operation-plans

Table 1 (Cont.): FSOP Checklist

FSOP COMPONENTS	REQUIREMENTS AND RECORD KEEPING	INCLUDED (Yes/No)
Maintenance schedule	A maintenance schedule for the UPSS is required. You must retain records of: ☐ The maintenance schedules ☐ Maintenance records including dates and work performed ☐ Copies of qualifications of the contractor	
System drawings	"As-built" drawings which show the UPSS (including tanks, pipes, dip and fill points, bowsers, pits). The drawings must show all modifications made to the UPSS since installation.	
Site plans	Site plans which show the following: ☐ The storage system ☐ All buildings and associated infrastructure, ☐ All fences and gates ☐ All groundwater monitoring wells (including any codes or symbols by which they are designated) ☐ Any unsealed ground surfaces ☐ The site drainage and service networks	
Standards followed for design, installation and modifications	A copy of the standards for: ☐ The design of the system ☐ The installation of the system ☐ The design of any modification ☐ The implementation of any modification If the UPSS was installed before June 2008 and copies of the standards are not available, you must have evidence that all reasonable steps have been made to obtain them.	
Specifications for design, installation and modifications	A copy of: ☐ The design specifications for the system ☐ The installation specifications for the system ☐ The design specifications for any modification ☐ The implementation specifications for any modification If the UPSS was installed before June 2008 and copies of the specifications are not available, you must have evidence that all reasonable steps have been made to obtain them.	
Records of employee site induction and incident management training	A training schedule which identifies the type of training provided and refresher training intervals is required. Site induction and training records must be kept. The records should include: ☐ Site inductions for all employees and contractors ☐ Competencies of employees and contractors and the tasks they can perform ☐ Incident management training	

DISCHARGE FROM SERVICE STATION FORECOURTS AND OTHER REFUELLING POINTS

For new service station sites, the discharge of wastewater including run-off from service station forecourts and other refuelling points (such as at bus depots, etc.) is not permitted. Refer to NSW EPA Practice Note, titled *Managing Run-off from Service Station Forecourts,* June 2019, for information on managing such wastewater.

For existing service station sites, the discharge of wastewater from existing service stations and other refuelling areas may be permitted, provided appropriate pre-treatment is provided and the requirements are adhered to (such as having a manual activated pump, an inspection aperture, etc.). Please refer to the *Liquid Trade Waste Management Guidelines* (DPIE, 2021) for further information, specifically section 5.3.11 and section F6.5 of Appendix F.

If a refuelling area is refurbished, then the discharge from this area must be disconnected from the sewerage system.

SITE PLANS

Workplaces with hazardous chemicals, such as fuel, must have site plans which meet the WHS and *UPSS Regulation* requirements. These plans are used by emergency services in an emergency and provide the location of above and below ground infrastructure for use by operators.

The following documents provide details of legislative site plan requirements:

- The *UPSS Guidelines* contain a list of what must be included on a site plan under the *UPSS Regulation*.
- The Hazardous chemical manifest technical note from Fire and Rescue NSW (FRNSW) has a list of site plan requirements which forms part of your hazardous chemicals manifest.
- The SafeWork NSW Guidance material – Notifications for Schedule 11 hazardous chemicals and abandoned tanks contains an example manifest site plan.

All operational sites with fuel storage must meet all of these requirements.

This is an example site plan. For large and complex sites, the plans can be split into above and below ground infrastructure (see following page).

Name of premises: XYZ Fuels
Address: 1 Main St, Town, NSW 2900
Lot: 1 DP: 12345
Date of this plan drawing: 1 Jan 2015
Date of last revision: 1 Jan 2016

LEGEND

- E – Electrical
- Fill points
- Groundwater monitoring wells
- Stormwater grates
- SW – Stormwater
- T – Telstra
- W – Water
- (Blue) Underground lines
- Canopy
- Vent pipes
- Bunded area
- S – Spill kit

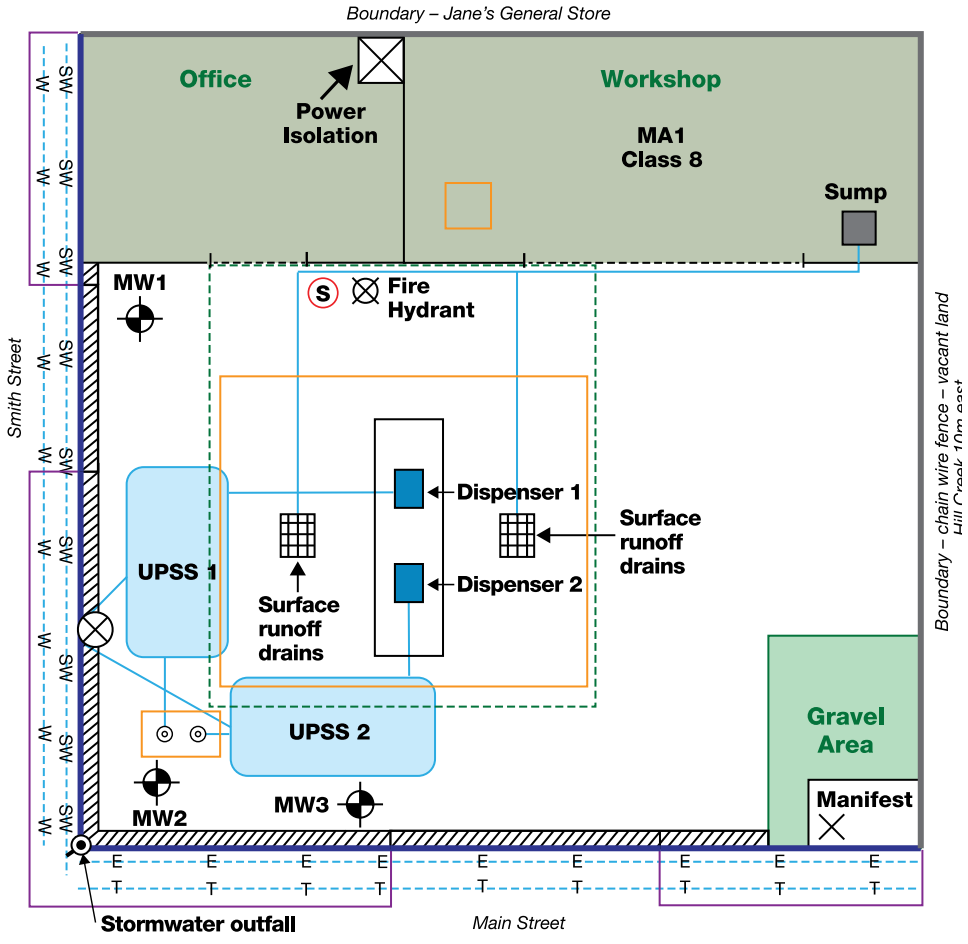
UPSS1 Diesel – Class C1 – Capacity 20,000 L

UPSS2 Petrol – Class 3 – Capacity 30,000 L

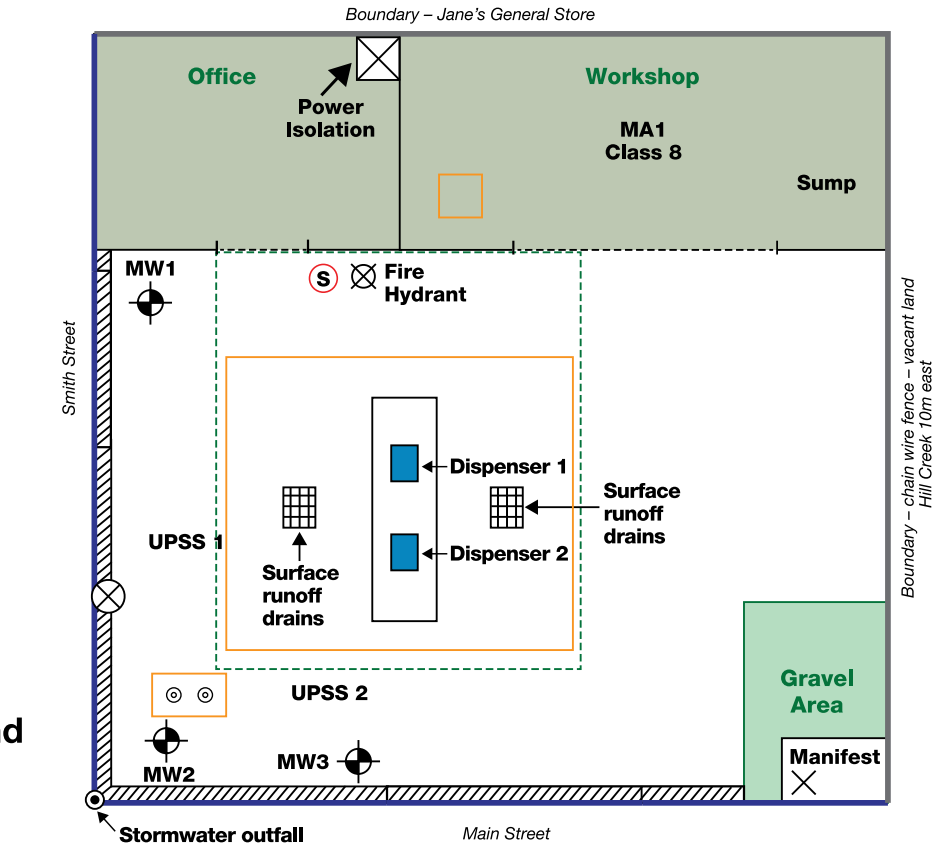
North

Scale (metres)

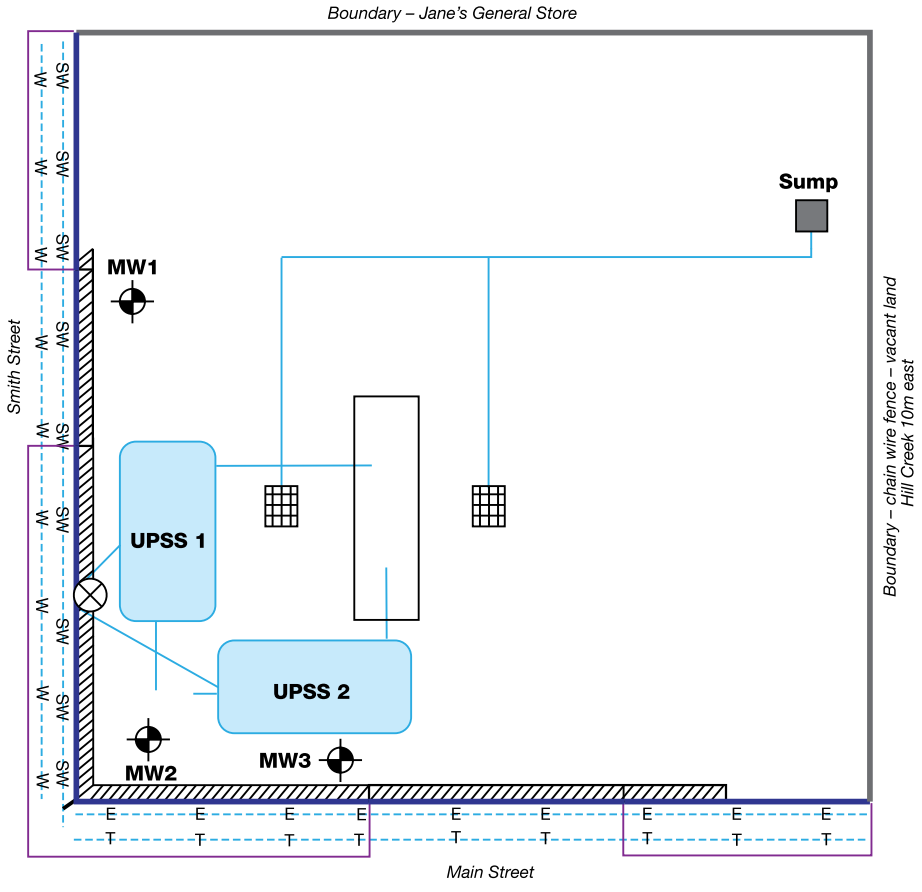
0 10 20



Site plans can also be separated into above and below ground components for clarity.



Site plan – above ground infrastructure.



Site plan – underground infrastructure.

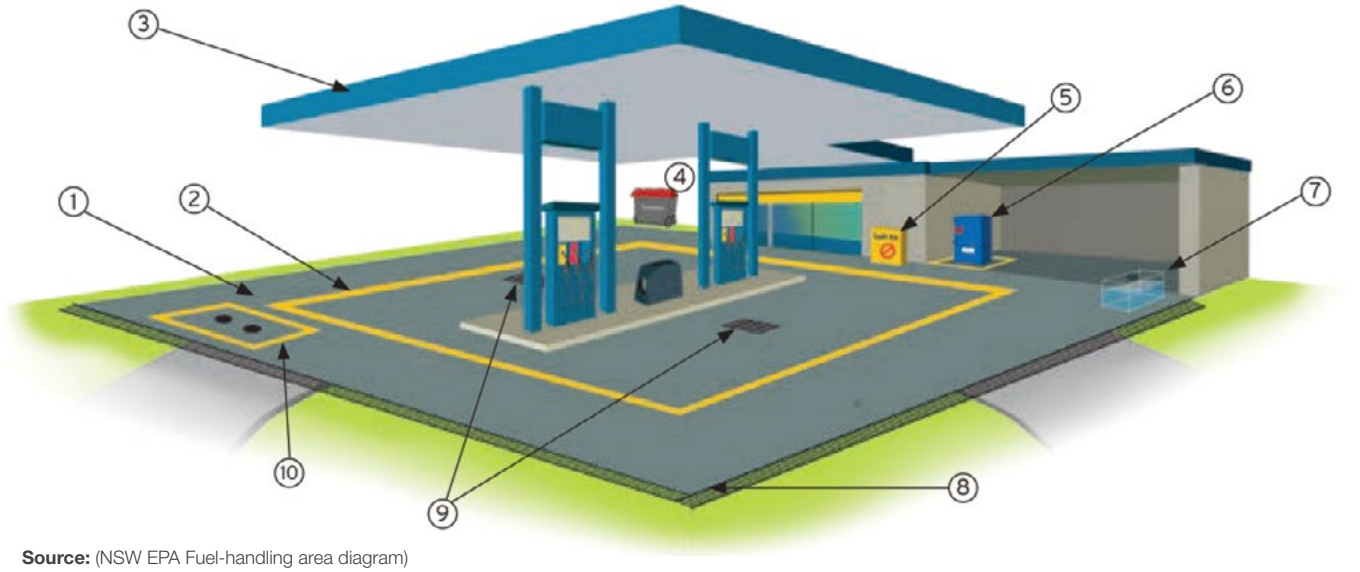
SITE DESIGN

The principal reason for having appropriate site design at a UPSS site is to prevent pollution and/or contamination from forecourt run-off discharging into stormwater drains and polluting natural watercourses, soil and neighbouring properties. An example of an appropriate design is shown in Figure 1.

Good design and management of fuel dispensing areas will reduce the incidence and impact of spills, saving you money in clean-up cost and minimising harm to the environment.

All fuel dispensing areas should have:

Figure 1: Design of fuel handling areas



Source: (NSW EPA Fuel-handling area diagram)

1. Sealed surfaces to stop spills seeping into the ground
2. Perimeter drains, bunding or grading which extends around the drip line of the canopy to contain spills. (It is possible to isolate the forecourt area by retrofitting “rollover” concrete or sealed rubber bunding. Search internet, phone directories etc. For ‘bunding’ to find suppliers and installers.)
3. Canopies which extend to the maximum reach of nozzles and have an angled overhang to stop rainwater from entering dispensing areas
4. Storage and waste bins to keep the area free from combustible or trip hazards
5. Accessible spill kit(s) for quick cleanup of small spills (see ‘spill kits and cleanup’ in this guide)
6. Bunded storage of hazardous chemicals away from fuel dispensers and traffic impact zones
7. A sump to retain liquids from the collection pits for treatment and/or removal
8. Stormwater drains that are protected from spills by forecourt bunding or grading
9. Collection pit(s) to capture spills from under the canopy-controlled area
10. Bunding that encloses the UPSS fill points to contain fuel discharges from tankers

Small spills can be contained and removed using a spill kit. Follow Minor Spill actions.

Large spills cannot be contained by a spill kit and may be in danger of moving offsite. Follow Major Spill actions.

Spill kits can still be employed to help contain spills before emergency services arrive.

The regulation of UPSS at service station sites seeks to prevent pollution via good practice design, installation, operation and maintenance of UPSS infrastructure. Leak detection is a key measure to prevent pollution.

The NSW EPA *'Guidelines for implementing the UPSS Regulation' ('UPSS Guidelines')* outlines how service station owners and operators should implement the *UPSS Regulation*. This guideline provides information to service station operators on:

- Good practice in implementing the *UPSS Regulation* and to prevent pollution. This includes a reference to the Australian Standards (AS4897-2008) which sets out good practice design, installation and operation of UPSS infrastructure, and
- Good practice operation and maintenance procedures for the early detection of pollution which includes loss monitoring and leak detection procedures.

Loss monitoring and leak detection procedures must be included in the 'fuel system operation plan' (FSOP) for the service station site. Service stations are not permitted to operate unless they have a FSOP. The FSOP describes how a site's underground fuel system is designed, managed, monitored and maintained and what steps are to be taken to rectify any leaks and/or spills.

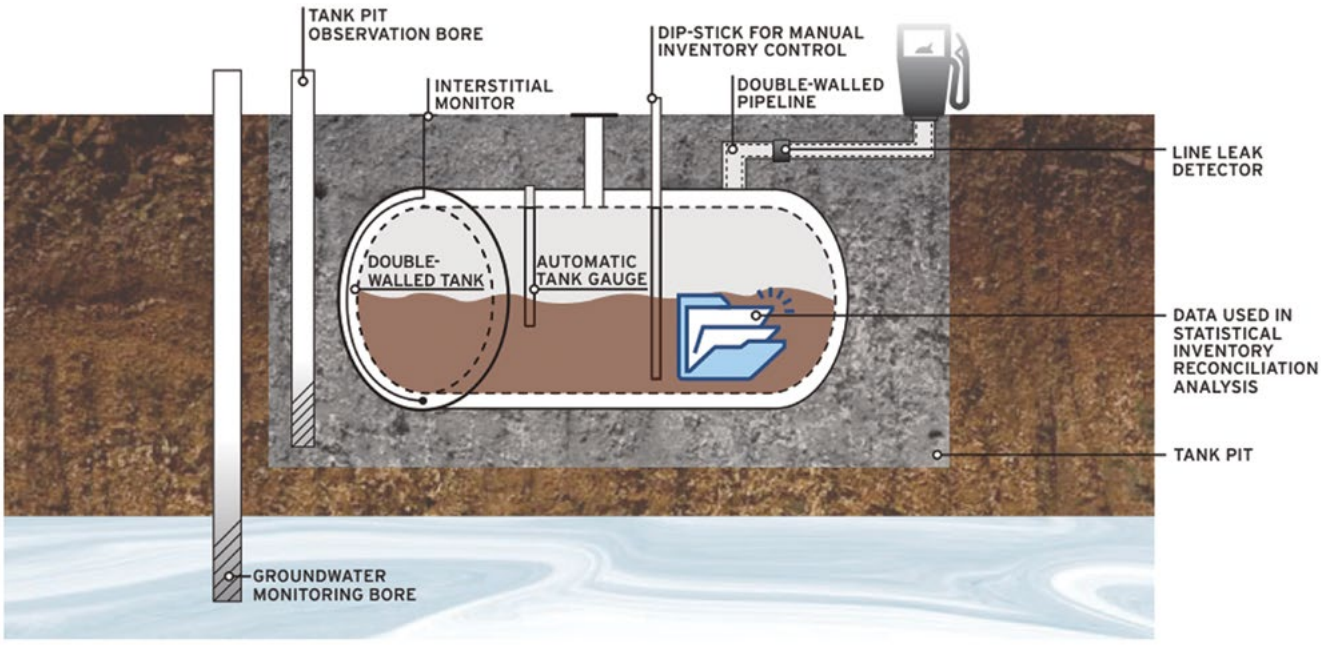
All new and significantly modified UPSS must have equipment identified in AS 4987–2008 including (but not limited to):

- Non-corrodible tanks and piping
- Secondary containment of tanks and piping
- Overfill protection devices
- Leak detection for tanks and piping
- Tank pit observation and groundwater monitoring wells

A schematic of a UPSS and monitoring wells is shown in Figure 2.

Additional considerations related to the design and installation of UPSS infrastructure include 'forecourt design' and 'stormwater management system'. Each is important to prevent surface water pollution. Further information can be found in the NSW EPA technical note on forecourt design.[7]

Figure 2: Good practice leak detection and loss monitoring



Source: *EPA Victoria Publication 1670, February 2018*

[7] https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/clm/19p2011-fact-sheet-1-fuel-handling-areas.pdf?la=en&hash=3A969A707E16F3D0EE7F13AB5A069A89A651F97D

LOSS MONITORING, LEAK DETECTION AND INCIDENT MANAGEMENT

A loss monitoring system compares the amount of fuel that should be present in the UPSS (from fuel deliveries orders and dockets) to the amount of fuel that is actually in the system when allowing for fuel sales, transfers and known losses. UPSS loss monitoring systems must be able to detect tank leaks and pipe leaks of at a rate of 0.76 L/hour or better, with greater than 95% confidence.

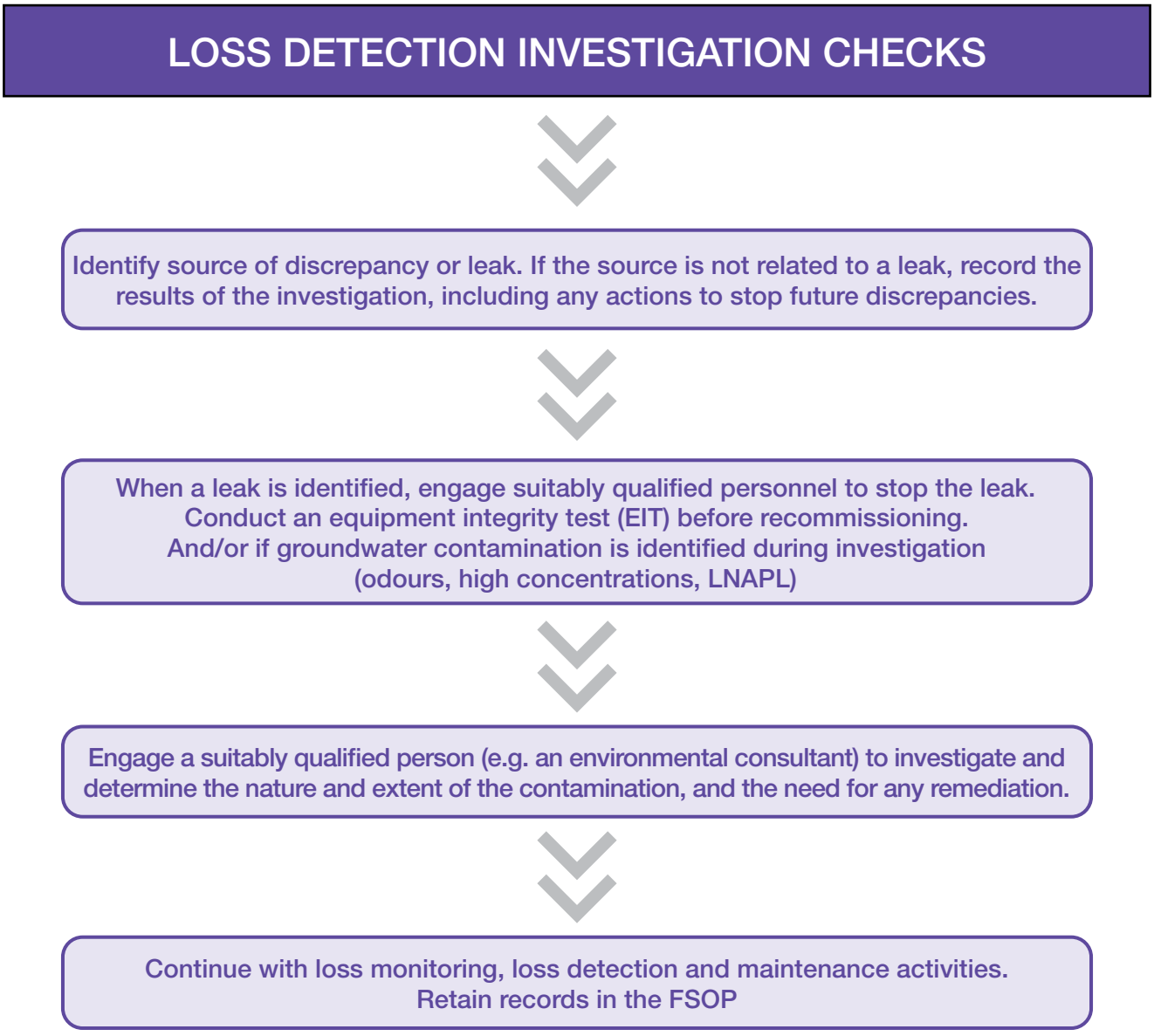
A statistical inventory reconciliation analysis (SIRA) is one type of a loss monitoring system. It uses computer software to identify discrepancies for investigation by analysing the measured volumes of fuel in the tanks on the site against delivery and sales records.

The *UPSS Regulation* requires a leak detection system at a UPSS site to detect pollutants in groundwater prior to the pollution plume migrating offsite. Good practice in leak detection is the installation of a network of groundwater monitoring wells. At least three monitoring wells are required, and these are to be designed by a qualified person and installed by a licenced driller.

Alternative leak detection systems must be approved by a duly qualified person, installed in accordance with the UPSS guidelines, and tested.

Where there is an emergency or an incident at a UPSS site, the incident management procedures in the FSOP should be followed (Refer Tab 6). An investigation must be conducted immediately if loss monitoring identifies a discrepancy, SIRA records a 'fail' or 'inconclusive' result, or a leak is detected.

Figure 3: Leak prevention and monitoring



Source: *EPA Victoria Publication 1670, February 2018*

MAINTENANCE AND SYSTEMS CHECK

Regular checks and maintenance of UPSS infrastructure is a practical measure to prevent and detect leaks and spills. The maintenance schedule must include details of what maintenance is carried out and/or is proposed to be carried out, and when. This is in relation to the storage system generally and the various gauges, indicators, groundwater monitoring wells and other measuring instruments in the system. System maintenance procedures and a maintenance schedule must be documented in the FSOP.

Council officers may ask for evidence to prove that regular maintenance and systems checks are being carried out at the premises.

Table 2: Checklist for recommended actions to taken by UPSS operators for maintenance of UPSS

TIMELINE	RECOMMENDED ACTIONS
Daily actions	☐ Dip tanks and record measurements. ☐ Dip E10 (bio-blend) tanks for water and dip all tanks after heavy rain. ☐ Remove water if above tolerance threshold. ☐ Check fill/dip points for damage. ☐ Check drains and remove blockages. ☐ Remove forecourt traffic hazards. ☐ Check spill kit contents and remove litter. ☐ Check collection pits and sump levels. ☐ Check hoses and nozzles for damage.
Weekly actions	☐ Check dipstick for wear. ☐ Dip tanks for water and remove water if present (non E10 and bio-blends). If the water level is increasing, investigate. ☐ Check vent points and remove blockages (if safe to do so). ☐ Check tank pit observation wells. ☐ Check sump under pumps.
Monthly actions	☐ Check SIRA report and immediately investigate all discrepancies, including 'fail' and 'inconclusive' results. ☐ Conduct observations of groundwater monitoring and tank pit observation wells.
Annual actions (recommended to be undertaken by a suitably qualified and experienced person)	☐ Service all leak detection equipment i.e. mechanical line leak detectors, electronic line leak detectors, sensor etc. ☐ Service all cathodic protection systems
Actions for new/modified UPSS	☐ Ensure that a suitably qualified person tests the system (including pipework) for leaks both before and after burial in accordance with AS4897-2008 and the *UPSS Regulation*. ☐ Check equipment requirements.
Pre-fuel delivery actions	☐ Check fill point spill containment area for product/water. ☐ Remove liquid prior to delivery and store for appropriate waste disposal.

Source: *EPA Victoria Publication 1670, February 2018*

Always shutdown all pumps and assess the situation

MAJOR SPILL

- **Fuel source cannot be stopped**
- **Greater than your spill kit can contain**
- **Spill may enter storm water drains/leave site**
- **Any leak/spill from a tanker**

RACE – Rescue, Alarm, Contain, Evacuate. → **CONTAIN** → **EVACUATE**

- **Rescue** – Rescue any people in immediate danger if safe to do so.
- **Alarm** – Notify relevant authorities:
  Fire brigade 000
  SafeWork NSW 131050
  EPA 131555
  Council _____
- Block main driveway to site. If driveway cannot be blocked safely, divert traffic away from fuel spill area.

If safe, use spill-kit to stop spill from:
- Entering storm water drains
- Leaving site
- Spreading

If situation unsafe go to assembly area and await emergency services.

- Evacuate customers and staff away from danger to the assembly area.
- Ensure all possible ignition sources are removed from spill area.
- Provide relevant authority with Safety Data Sheets and hazardous chemical manifest site plan (see example site plans).

MINOR SPILL

- **Can be contained by your spill kit** and **Fuel source is stopped** and **Will not enter storm water drains or leave site**

- Assess for hazards.
- Block off spill area with cones/tape.
- If safe, use spill-kit to stop spill from:
  – Entering storm water drains – Leaving site – Spreading

AFTER ALL SPILLS

- Dispose of liquid waste and spill clean up materials to an approved waste facility.
- Restock spill-kit.
- Review and implement measures to prevent spill from reoccurring
- Following a major spill, resume trading only after authorisation by Fire and Rescue/council/EPA representative.

Where a leak or spill is causing or is likely to cause material harm to the environment or human health, you must notify each relevant authority as soon as practicable. Failure to report such pollution incidents is an offence under Part 5.7 of the POEO Act. Relevant authorities include EPA, Council, SafeWork NSW, Fire and Rescue NSW, Rural Fire Service and NSW Health (see contact list).

DISPOSAL OF WASTE

Waste associated with fuel sites can be hazardous and requires special consideration. You are legally required to ensure your waste is stored, transported and disposed of safely and lawfully. Planet Ark's Business Recycling website lists local waste collection services, waste facilities, recyclers and transporters.

Spill kit materials used to contain and clean up fuel and other volatile substance spills should be classified before disposal using the

EPA's Waste Classification Guidelines. Check with your spill kit supplier and waste transporter for disposal options.

Rags and oil-absorbent materials that only contain non-volatile petroleum hydrocarbons and do not contain free liquids can be disposed of as general solid waste (non-putrescible).

Soil contaminated following a leak or spill may need to be investigated and potentially removed as waste. If the soil needs to be removed, it must be classified before it is transported. More information on waste classification is available on the EPA website.

Lead acid batteries (car batteries) contain a variety of hazardous chemicals as well as valuable metals. Approximately 96% of a car battery can be recycled. There are regulations relating to the safe transport and disposal of lead acid batteries. For more information on waste lead acid batteries visit the EPA website.

Tyres that are used, rejected or unwanted are classified as 'waste tyres' and need to be managed responsibly. This includes casings, seconds, shredded tyres or tyre pieces.

Tracking must be used for loads of more than 20 waste tyres (or 200 kilograms). You must be able to provide information about the lawful transport and disposal of waste tyres at any time. More information on waste tyres is available on the EPA website.

Tyres can also be reused for land application purposes under the general resource recovery order and resource recovery exemption for tyres. For more information, please refer to the current EPA resource recovery orders and exemptions.

Waste oil can cause significant harm if released into the environment. One litre of oil can contaminate one million litres of water. Used oil is a valuable resource which can be recovered and reused. Many council and waste management facilities will accept used oil for recycling and disposal purposes. You may search for liquid waste treatment facilities that are licensed by the EPA using the EPAs Public Registers.

It is dangerous to store used oil in containers for long periods of time. Many materials can degrade when in contact with used oil, increasing the risk of a spill. For more information on waste mineral oil visit the EPA website.

For details on the legislative requirements related to these and other waste types visit EPA Waste and Recycling web pages.

SPILL KITS AND CLEAN UP EQUIPMENT

Spill kits are designed to be used on specific groups of chemicals to contain and clean up small scale spills. They must be readily accessible on the forecourt.

Suppliers will state the liquids, application and absorbent capacity of their kits.

Basic tools such as the following should be available:

- shovel
- broom
- rake
- absorbent booms or socks and pads
- contaminant resistant gloves
- disposable coveralls
- warning sign
- contaminated waste container
- a respirator with an organic cartridge.

Check that you have spill kits available and that they are right for all the different chemicals that you use.

Spill kits you need to consider include:

- **Oil and fuel** – specifically designed for oil and fuel.
- **AdBlue** – required for sites with AdBlue as oil and fuel kits are unsuitable.
- **Hazardous Chemicals** – for use on chemicals used in workshops.
- **Marine** – designed for use on oil and fuel spills on water.

If you have used your spill kit, ensure you dispose of the waste appropriately (see waste, previous page) and restock spill kit.

Check your forecourt spill kit regularly. Where spill kits are stored in a container that may be mistaken for a rubbish bin, a cover or quick release lock will secure the contents whilst still making the contents accessible.

Employees should be aware of who to contact in event of a spill (see spill actions) and trained in spill clean up procedures.

LEAK PREVENTION AND MONITORING

The *UPSS Regulation* sets out three levels of protection to prevent and detect leaks:

System design
Integrity tested, non corrodible, double walled tanks and lines and overfill protection devices are mandatory for all new and significantly modified systems.

Operational Management
Procedures for loss detection, maintenance, modification, repair, commissioning and incident management are mandatory if your tanks contain fuel.

System backup
Secondary leak detection system (groundwater monitoring wells or alternative) must be installed.

Monitoring the fuel in your tanks will detect leaks early. This will save you money in lost stock and clean up bills, reduce your legal liabilities, protect property values and your local community.

Loss monitoring
Most operations use SIRA to check for losses. SIRA identifies discrepancies by analysing a series daily records, logged by someone trained to use the equipment and analysed by an independent third party.

Leak detection
Groundwater monitoring wells are installed and inspected every six months as a back up to loss monitoring. Where groundwater wells are not suitable, an alternative system can be used, providing it is designed and installed by a suitably qualified person.

Loss investigation
Whenever a discrepancy in loss monitoring is identified, SIRA records a 'fail' or 'inconclusive' result or a leak is detected, an investigation must be conducted immediately.

Carry out loss detection investigation checks

Identify source of discrepancy or leak.

Where the source is not related to a leak, record the results of the investigation, including any actions to stop future discrepancies.

When a leak is identified.

Engage a suitably qualified person to repair or replace tank infrastructure or replace piping or lines.

Engage a suitably qualified person to carry out an equipment integrity test (EIT) before recommissioning.

Check requirements to notify ARA using leak notification form within 30 days of the leak being detected.

If remediation is required, check council development application requirements for remedial work. Engage a suitably qualified person to remediate

Continue with loss monitoring, loss detection and maintenance activities.

In addition, whenever groundwater contamination is identified you must:

Undertake sampling and analysis of groundwater using NATA accredited laboratory.

If there is evidence of petroleum (odours, high concentrations, free phase), engage a suitably qualified person to investigate and determine the nature and extent of the contamination. Notify ARA using leak notification form within 30 days of leak being detected.

Where a leak or spill at a UPSS is causing or likely to cause material harm to the environment or human health, the person responsible must notify the relevant authorities as soon as practicable. Failure to report such pollution incidents is an offence under Part 5.7 of the *POEO Act*.

LOSS DETECTION INVESTIGATION CHECKS

To assist in determining the cause of a discrepancy identified during loss monitoring, the following system checks may be initiated (where appropriate) by the person responsible for a UPSS.

Table 3: Checklist for leak investigations

SUSPECTED ISSUE	LOSS OR GAIN	EXAMPLE OF SYSTEM CHECK TO BE CONDUCTED BY A SUITABLY QUALIFIED PERSON
Inventory Records	Loss or Gain	Check the inventory control records from the last satisfactory result to ensure the discrepancy has not been caused by a record-keeping error.
Security or Theft	Loss	On non 24-hour sites, check that all tank openings (e.g. dip and fill points) are secured, particularly after hours. On self-serve sites, check that the controlled authorisation of dispensers is operating. Check CCTV or similar security system if available.
Human Error	Loss or Gain	Check: ☐ UPSS installation records – was the installer accredited/certified? ☐ for inaccurate measuring/recording ☐ delivery losses/tank filling activities ☐ for inadequate system management ☐ failure to complete physical system checks.
Recent repairs to UPSS	Loss or Gain	Check the maintenance records. If the UPSS has been repaired or reuse has occurred, check whether compatible materials were used.
Water	Loss or Gain	Check each tank for water by putting a water-finding paste on a dipstick. Identify entry point (e.g. if tank has a hole or water is entering via an open valve, fill point etc.). If using ATG, check the inventory report that highlights the water's height and volume. (If you have also checked your dipstick and the two vary, it may simply be the location, distance and tank tilt. If you're still uncertain, have the calibration checked by a manufacturer-trained technician.)
Dipstick / ATG	Loss or Gain	Check: ☐ The dipstick for wear/damage and replace if necessary ☐ That each tank has the correct dipstick ☐ That the system operates to manufacturer's specifications and has been calibrated (if you're using ATG)

Source: *NSW EPA UPSS Guidelines- Appendix 5*

Table 3 (Cont.): Checklist for leak investigations

SUSPECTED ISSUE	LOSS OR GAIN	EXAMPLE OF SYSTEM CHECK TO BE CONDUCTED BY A SUITABLY QUALIFIED PERSON
Fill points, spill boxes, pumps and piping manifolds	Loss or Gain	☐ For a dispenser with a pump located inside the dispenser unit, remove the covers and check valves and pipework for leaks, both while it is operating and when it is switched off. ☐ For submersible pumps, lift the pump cover and check the wells for leaks. ☐ For piping manifolds, lift the pit cover and check for any leak. ☐ Check fill point seals and covers for damage.
Tank Pit Wells	Loss	Check for any evidence of petroleum in the wells.
Vents	Loss	Check: ☐ Vent caps for any visible blockages ☐ Vents for evidence of petroleum blow-out at either the vent outlet, or below the vent outlets on the ground or building walls.
Dispenser pumps are over or under dispensing	Loss or Gain	Check that dispenser totals and console totals are: ☐ Recorded ☐ Operating within their accepted tolerances ☐ Within acceptable limits (as stated by the National Measurement Institute). Also check the maintenance schedule and calibration of dispensers and inspect under sump pump (if there is one).
Sales Test	Loss or Gain	Determine tank and dispenser relationships by identifying single stock systems: ☐ Establish opening stock datum and do not alter the single stock systems for the duration of the sales test ☐ During the sales test the operator should satisfy the requirements of the delivery procedures and run the test for five days or until the issue is resolved ☐ The final stock reconciliation should be performed by the person responsible for the UPSS operation
Interstitial monitoring (where relevant)	Loss	Check that: ☐ The system is active ☐ Leak detection measurements are within the manufacturer's tolerances ☐ Leak detection measurements have been recorded for the system If any other losses outside the manufacturer's leak detection tolerances have been reported in the last six months, undertake further investigation to identify the source of the leak
Equipment integrity test (EIT)	Loss or Gain	If none of the above investigations reveals a reason for the discrepancy in the reconciliation records, an EIT may be required.

MAINTENANCE AND SYSTEM CHECKS

Regularly checking and maintaining your system will help you prevent and detect leaks and spills.

Examples of some scheduled maintenance and system checks are provided below. These actions may vary from site to site depending on company and manufacturer specifications.

Daily actions:

- Dip tanks and record measurements.
- Dip E10 (bio-blend) tanks for water and all tanks after heavy rain.
- Check fill/dip points for damage.
- Check drains and remove blockages.
- Remove forecourt traffic hazards.
- Check spill kit contents, remove litter.
- Check collection pits and sump levels.
- Check hoses and nozzles for damage.

Weekly actions:

- Check dip stick for wear.
- Dip tanks for water and remove water if present (non E10 and bio-blends).
- Check vent points and remove blockages.
- Check tank pit observation wells and immediately investigate leaks.
- Check under sump pumps.

Monthly actions:

- Check SIRA report and immediately investigate all discrepancies including fail and inconclusive results.

Pre delivery actions:

- Check fill point spill containment area for product/water. Remove liquid prior to delivery and store for appropriate waste disposal.

Six monthly actions:

- Sample groundwater monitoring wells and immediately investigate leaks.

Annual Actions:

- Service leak detection equipment.
- Service cathodic protection systems.

Actions for new and modified systems:

- Ensure suitably qualified person tests the system (including pipework) for leaks before and after burial in accordance with AS4897-2008 and UPSS Regulation.
- Check requirements to install Vapour recovery at service stations section of the EPA website.

Maintenance activities must be recorded. The UPSS Guidelines provide further information on your responsibilities.

STAFF TRAINING

This guide should form part of your employee incident prevention and management training. It will inform and remind them of the procedures you have in place to reduce the likelihood of leaks and spills and tell them what to do if there is an incident.

Record training sessions on this page and make a note of any comments that arise from training.

STAFF TRAINING SCHEDULE		
Date:	Attendees:	Comments:
Date:	Attendees:	Comments:
Date:	Attendees:	Comments:
Date:	Attendees:	Comments:
Date:	Attendees:	Comments:
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