



# **UPSS Technical Note: Decommissioning, Abandonment and Removal of UPSS**

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## *Note*

This technical note is advisory only. It has been prepared to support some of the requirements and processes outlined in *Guidelines for implementing the Protection of the Environment (Underground Petroleum Storage Systems) Regulation 2008* prepared by the Department of Environment, Climate Change and Water NSW (DECCW 2009). It should be read in conjunction with recognised industry best practice and standards and other technical publications.

The note will be revised from time to time following feedback from stakeholders using it, ensuring its ongoing relevance and reflecting advances in best practice as the result of regulator and industry experience. Comments on it are welcome and should be sent via email to [UPSSREG@environment.nsw.gov.au](mailto:UPSSREG@environment.nsw.gov.au)

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## 1. Introduction

Leaking underground petroleum storage systems (UPSS) have been identified in NSW as a significant source of soil and groundwater contamination. Remediation of a leaking system can also be very expensive, especially if leaks have been occurring over a prolonged period.

At many former UPSS sites, where abandonment has not been carried out properly, it has often been difficult to locate any system components remaining onsite or determine the exact location of contamination that may have resulted. This lack of information on UPSS can create occupational health and safety (OH&S) hazards, complicate excavation or demolition of a site, result in further contamination of soil and groundwater, and greatly increase the cost of any necessary remediation.

To reduce the environmental risk and harm from leaking UPSS, a number of laws and policies govern the decommissioning,<sup>1</sup> abandonment and removal of these systems. These include the Occupational Health and Safety Regulation 2001, Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008 (the 'UPSS Regulation') and *State Environmental Planning Policy No. 55*. Industry best practice described in a number of Australian Standards must also be followed when decommissioning UPSS.

This technical note seeks to clarify stakeholder roles and responsibilities in the decommissioning, abandonment and removal requirements of UPSS in line with relevant legislation, policies and industry best practice.

## 2. Decommissioning, abandonment and removal process

Removal of the tank is the preferred option for dealing with disused or unwanted UPSS as it allows for a more thorough investigation and assessment of any contamination remaining at the site. Tank removal and remediation of any residual contamination decreases environmental and OH&S risks at UPSS sites, which reduces the liability of the person responsible for the site and/or its owner while increasing potential future land-use options.

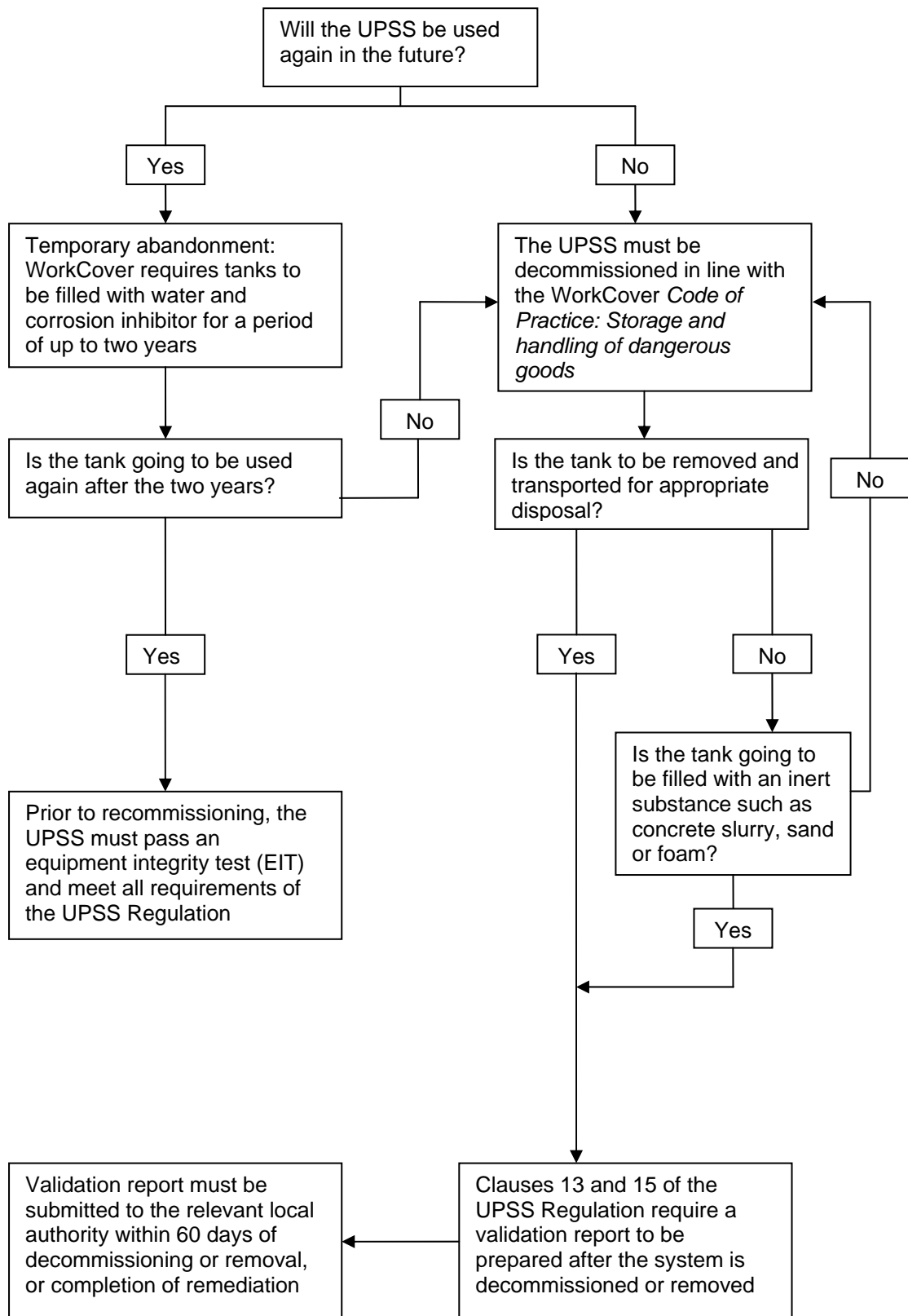
However, depending on the site, it may be impractical or undesirable to remove some UPSS, such as those located in the basement of a building or where removal will have an impact on other structures. In these situations, the disused UPSS should be emptied and decommissioned in situ by filling the tank with a concrete slurry, sand or foam.

Figure 1 summarises the steps involved in decommissioning, temporarily abandoning or removing tanks. The person responsible for management and control of a UPSS must ensure compliance with the requirements of the following legislation and policies as well as using industry best practice wherever possible:

- Clause 174ZF of the Occupational Health and Safety Regulation 2001: Cleaning or decommissioning plant, equipment and containers
- *Code of Practice: Storage and handling of dangerous goods* (NSW WorkCover Authority 2005)
- Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008
- *AS1940–2004: Storage and handling of flammable and combustible liquids* (AS 2004)
- *AS4976–2008: Removal and disposal of underground petroleum storage tanks* (AS 2008).

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<sup>1</sup> 'Decommissioning' under the UPSS Regulation means to permanently abandon the use of a system or to render it permanently unusable.



**Figure 1: Overview of requirements for decommissioning, abandoning or removing UPSS**

All decommissioning, abandonment or removal works must be carried out by a 'duly qualified person' as defined in the UPSS Regulation.

Assistance in meeting the requirements and other advice is available from:

Department of Environment, Climate Change and Water (DECCW)

Phone Environment Line: 131 555

Website: [www.environment.nsw.gov.au/clm/upss.htm](http://www.environment.nsw.gov.au/clm/upss.htm)

NSW WorkCover Authority

Phone Assistance Service: 131 050

Website: [www.workcover.nsw.gov.au](http://www.workcover.nsw.gov.au)

### 3. Specific requirements to be met

#### Occupational health and safety requirements

Clause 174ZF of the Occupational Health and Safety Regulation 2001 describes the requirements for cleaning or decommissioning plant, equipment and containers as follows:

'an underground tank must be made free from dangerous goods or otherwise made safe if it has not had dangerous goods placed in or taken from it for a continuous period of twelve months.'

*Code of Practice: Storage and handling of dangerous goods* (NSW WorkCover Authority 2005) states that where:

'two years have elapsed since any dangerous goods were last put in or taken from a tank, the person responsible for the site must remove any remaining dangerous goods, and abandon the tank in compliance with the following industry best practices –

- *AS1940–2004: Storage and handling of flammable and combustible liquids*
- *AS4976–2008: Removal and disposal of underground petroleum storage tanks.*

The Code of Practice also requires the person responsible to notify WorkCover within seven days of the tank abandonment. The notification must include:

- information on tank size, location and method of abandonment
- an as-built site plan that clearly identifies the location of the abandoned tank in relation to other tanks and buildings onsite and the site boundaries
- a copy of a letter from a duly qualified contractor confirming the abandonment.

The Code of Practice outlines three options available for the abandonment or removal of underground tanks at a site:

- removal of the tank from the ground and transport of it to a disposal area<sup>2</sup>
- filling of the tank with an inert solid material, such as concrete slurry, sand or foam
- where the tank is to be used again (within two years), filling it with water and a corrosion inhibitor.<sup>3</sup>

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<sup>2</sup> Metal recycling companies that accept removed steel tanks require, as a minimum, a tank to be emptied, cleaned, washed, degassed and ripped open prior to delivery to any of their facilities.

<sup>3</sup> If it is likely that the tank will be used again within two years, on written application WorkCover may grant an exemption to allow the tank to be filled with water and corrosion inhibitor for a brief period of time (referred to as 'temporary' abandonment).

When removing the tanks or filling them with an inert substance, the Code of Practice requires suitable work procedures to be adopted for any work on existing or abandoned underground tanks or associated piping as such activities are potentially dangerous and can cause serious health risks. The following work procedures, outlined in NSW WorkCover Authority 2009, must be followed:

- Work must be carried out by a competent person<sup>4</sup> with the 'appropriate hot work permit'<sup>5</sup> and comply with *AS1940–2004*, *AS4976–2008* and *AS1674.1–1997: Safety in welding and allied processes – Fire precautions* (AS 1997).
- Tanks should be emptied of all dangerous goods and made gas-free.
- All associated piping should be disconnected and made safe so that no flammable or combustible liquid remain. Filling pipes with water or concrete slurry is no guarantee of safety, as they may still contain flammable liquid. Cutting pipes also carries higher safety risks.
- Before a tank is removed, it should be checked to ensure that it can withstand lifting and transport.
- WorkCover must be notified in order to cancel the location of the tanks on their database.

These procedures are for the permanent abandonment (decommissioning) of tanks, as they render them no longer usable and trigger requirements to be met under the UPSS Regulation (see below).

## UPSS Regulation requirements

The UPSS Regulation requires preparation of a site validation report where a tank has been decommissioned or removed from a site. The validation report must provide independent verification that goals associated with site works have been met and the site is suitable for its ongoing or future uses.

Reports should be prepared by a suitably qualified and experienced person, such as a contaminated land consultant. Advice on selecting consultants is available at [www.environment.nsw.gov.au/clm/selectaclmcons.htm](http://www.environment.nsw.gov.au/clm/selectaclmcons.htm).

The UPSS Regulation requires the validation report for a site to be submitted to the relevant local authority within 60 days of completion of the validation or remediation works. The report is used by the council to support future planning decisions about the land uses which are suitable for the site.

*UPSS Technical Note: Site validation reporting* (DECCW 2010) provides more information and guidance on meeting the requirements of the UPSS Regulation and is available at [www.environment.nsw.gov.au/clm/upssguidelines.htm](http://www.environment.nsw.gov.au/clm/upssguidelines.htm). In particular, it notes that validation of the tank pit alone does not necessarily meet the requirements of the UPSS Regulation.

Validation reports for tanks decommissioned in situ, such as where their removal is impractical or will affect other structures, must include a site drawing showing the location of all equipment and associated infrastructure remaining at the site. In these cases, sampling

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<sup>4</sup> Clause 318 of the Occupational Health and Safety Regulation 2001 defines a 'competent person' as someone who has acquired, through training, qualifications or experience, or a combination of the three, the knowledge and skill to carry out that task. It is suggested that the work should be undertaken by a person with a demolition licence and chemical endorsement.

<sup>5</sup> 'Appropriate hot work permit' is a written document issued by the controller/owner or employer responsible for a workplace which stipulates the conditions under which work within a specified area may be carried out. The permit can only be issued after all precautions listed in *AS1674.1–1997* have been addressed. If the work involves the actual tank that has contained flammable goods or 'hot work' near the tank or plant, the tank should be gas-free. The work permit should clearly identify the limit of the work area and prohibit entry into the hazardous area.



should be carried out in the surrounding soils as close to the tank pit as practicable using safe working practices.

## Planning requirements

Decommissioning must address all areas of the site consistent with the requirements of the UPSS Regulation and *State Environmental Planning Policy No. 55: Remediation of land* (SEPP 55). DUAP (1998a) outlines planning guidelines in relation to SEPP 55.

Proponents should check with the local council to determine whether development consent is required for the remediation work (either category 1 or category 2 remediation). The planning authority must be satisfied that under ongoing or new land use, human health and the environment will not be adversely affected by any remaining contamination.

SEPP 55 requires the local authority to be notified 30 days prior to the commencement of works and within 30 days of their completion. Under the UPSS Regulation, a validation report must be provided to the council or other relevant authority within 60 days of completion of the validation or remediation works.

Section 3.6 of *Planning and development process for sites with underground petroleum storage systems* (DECCW 2009b) considers planning issues from a local council perspective.

## Industry best practice

As discussed previously, *Code of Practice: Storage and handling of dangerous goods* (NSW WorkCover Authority 2005) requires the following Australian Standards to be considered when decommissioning, abandoning or removing tanks:

- *AS1940–2004: Storage and handling of flammable and combustible liquids* (AS 2004)
- *AS4976–2008: Removal and disposal of underground petroleum storage tank* (AS 2008).

These standards identify industry best practice procedures and OH&S considerations when a tank is decommissioned, abandoned or removed.

In general, removal of tanks when they are no longer in use is preferred industry best practice. However, where tanks are to remain in situ, the disused UPSS should be emptied and decommissioned and records kept of the methods used and the size, description and location of the tanks. Reports must be provided to WorkCover and the relevant local authorities.

An industry-recognised specialist and licensed contractor with knowledge and experience in the field of tank removal (a ‘duly qualified person’ under the UPSS Regulation) should be engaged to remove UPSS. They should be able to provide a comprehensive range of works and appropriately document the removal of tanks and supporting infrastructure.

Tank removal should include the recording of any evidence that a leak has occurred, whether contamination is present within the excavation and all containment and mitigation measures undertaken at the time of the removal. A photographic and/or video log of the event is strongly recommended, as well as field screening of materials to assist in sample assessment during and immediately after tank removal.

Some of the more common observations during removal include:

- evidence of tank or pipe failure via holes or corrosion
- evidence of odours, staining or sheen within the excavation pit or the collection of water in the pit
- the use of incompatible UPSS materials for the product being stored
- incompatible geotechnical conditions, such as reactive or collapsing soils

- evidence of human error, such as inadequate system management, poor installation, damage, tank filling activities, loose fittings and spills
- bent, damaged or unsuitable tank dipping or gauging equipment, such as perforations of the lining of the tank by dip sticks.

The procedure to be followed should be planned and documented before tank removal gets under way. This should include contingencies to deal with any contaminated soil or groundwater which may be encountered and any other related site-specific issues, such as shallow groundwater in the area.

Consideration should also be given to the requirements of the relevant dangerous goods legislation when transporting disused tanks.

#### **4. Other options for fuel storage**

If the operator intends to continue to store petroleum on the site, above-ground tanks may be a suitable alternative to underground storage. When considering an above-ground tank, development approval with reference to *State Environmental Planning Policy No. 33: Hazardous and offensive development* (SEPP 33) is required. SEPP 33 ensures that the merits of proposals are properly assessed in relation to offsite risk and offence before being determined by the consent authority.

DUAP (1998b) provides guidelines on the application of SEPP 33.

When installing above-ground storage tanks, the following Australian Standards should be considered:

*AS1940–2004: Storage and handling of flammable and combustible liquids:* Industry best practice prefers that provisions are made to contain any leak or spill from the tank storage facility and prevent it from contaminating the surrounding soil or entering a watercourse or drainage system. Above-ground storage tanks should rest on a foundation which provides adequate support, without unacceptable or uneven settling. The net capacity of a compound must be at least the capacity of the largest tank. Section 5.8.3 of *AS1940–2004* contains design and construction requirements that a compound and its associated bund should comply with.

*AS1692–2006: Steel tanks for flammable and combustible liquids:* This standard specifies the requirements for the design and construction of commercial-grade low carbon steel tanks or stainless steel for the storage of flammable and combustible liquids.

## References and further reading

*Links were current at time of publication.*

AS 1997, *AS1674.1–1997: Safety in welding and allied processes – Fire precautions*, Standards Australia, Sydney; available at [www.standards.org.au](http://www.standards.org.au)

AS 2004, *AS1940–2004: Storage and handling of flammable and combustible liquids*, Standards Australia, Sydney; available at [www.standards.org.au](http://www.standards.org.au)

AS 2006, *AS1692–2006: Steel tanks for flammable and combustible liquids*, Standards Australia, Sydney; available at [www.standards.org.au](http://www.standards.org.au)

AS 2008, *AS4976–2008: Removal and disposal of underground petroleum storage tanks*, Standards Australia, Sydney; available at [www.standards.org.au](http://www.standards.org.au)

DECC 2007, *Environmental action for service stations*, Department of Environment and Climate Change NSW, Sydney – Guide to assist operators of service stations understand the environmental risks of their operations and improve environmental management; available at [www.environment.nsw.gov.au/sustainbus/service.htm](http://www.environment.nsw.gov.au/sustainbus/service.htm)

DECCW 2009a, *Guidelines for implementing the POEO (Underground Petroleum Storage Systems) Regulation 2008*, Department of Environment, Climate Change and Water NSW, Sydney; available at [www.environment.nsw.gov.au/clm/upssguidelines.htm](http://www.environment.nsw.gov.au/clm/upssguidelines.htm)

DECCW 2009b, *Planning and development process for sites with underground petroleum storage systems*, Department of Environment, Climate Change and Water NSW, Sydney; available at [www.environment.nsw.gov.au/clm/upssguidelines.htm](http://www.environment.nsw.gov.au/clm/upssguidelines.htm)

DECCW 2010, *UPSS Technical Note: Site validation reporting*, Department of Environment, Climate Change and Water NSW, Sydney; available at [www.environment.nsw.gov.au/clm/upssguidelines.htm](http://www.environment.nsw.gov.au/clm/upssguidelines.htm)

DUAP 1998a, *Managing Land Contamination: Planning guidelines SEPP 55 – Remediation of land*, Department of Urban Affairs and Planning and Environment Protection Authority, Sydney; available at [www.planning.nsw.gov.au/assessingdev/pdf/gu\\_contam.pdf](http://www.planning.nsw.gov.au/assessingdev/pdf/gu_contam.pdf)

DUAP 1998b, *Applying SEPP 33: Hazardous and offensive development application guidelines*, Department of Urban Affairs and Planning and Environment Protection Authority, Sydney; note a revised consultation draft is available at [www.planning.nsw.gov.au/PlansforAction/Majorhazards/PlanningGuidelinesforHazardousDevelopment/tabid/168/Default.aspx](http://www.planning.nsw.gov.au/PlansforAction/Majorhazards/PlanningGuidelinesforHazardousDevelopment/tabid/168/Default.aspx)

NSW WorkCover Authority 2005, *Code of Practice: Storage and handling of dangerous goods*, Gosford; available at [www.workcover.nsw.gov.au/OHS/DangerousGoods/Guides/Pages/default.aspx](http://www.workcover.nsw.gov.au/OHS/DangerousGoods/Guides/Pages/default.aspx)

NSW WorkCover Authority 2009, *Fact sheet 3\_1: Dangerous goods – Abandoning disused underground tanks*, Gosford; available at [www.workcover.nsw.gov.au/Documents/Publications/AlertsGuidesHazards/TransportAndStorage/abandoning\\_disused\\_underground\\_tanks\\_dangerous\\_goods\\_factsheet\\_5218.pdf](http://www.workcover.nsw.gov.au/Documents/Publications/AlertsGuidesHazards/TransportAndStorage/abandoning_disused_underground_tanks_dangerous_goods_factsheet_5218.pdf)

## Legislation

*Links were current at time of publication.*

Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008; available at [www.environment.nsw.gov.au/clm/upss.htm](http://www.environment.nsw.gov.au/clm/upss.htm)

*Environmental Planning and Assessment Act 1979* – the principal planning legislation in NSW; available at [www.legislation.nsw.gov.au/](http://www.legislation.nsw.gov.au/)

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Occupational Health and Safety Regulation 2001 – Clause 174ZF: Cleaning or decommissioning plant, equipment and containers; available at [www.legislation.nsw.gov.au/](http://www.legislation.nsw.gov.au/)

*State Environmental Planning Policy No. 33: Hazardous and offensive development*; available at [www.planning.nsw.gov.au](http://www.planning.nsw.gov.au)

*State Environmental Planning Policy No. 55: Remediation of land*; available at [www.planning.nsw.gov.au](http://www.planning.nsw.gov.au)