

Regulatory Impact Statement

Proposed Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Department of **Environment and Conservation** NSW



Submissions

The Department of Environment and Conservation NSW (DEC) invites you to make written submissions on this Regulatory Impact Statement and on the proposed Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005.

Submissions should be made in writing and sent to:

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SUMMARY

The Department of Environment and Conservation is proposing a new Regulation that will mandate a preventative approach to minimise the risk of soil and groundwater contamination from leaking underground storage tanks (which are part of underground petroleum storage systems or UPSS). In particular, these leaks are potentially a significant source of groundwater contamination, and remediation can be extremely costly, technically difficult and time consuming.

The proposed Regulation provides for early detection of leaks, reporting and investigation of leaks, and the implementation of appropriate operational management systems at all UPSS sites.

This Regulatory Impact Statement (RIS) contains an assessment of the costs and benefits of the proposed Regulation. It shows that the proposed Regulation would result in quantified net benefits to NSW of around \$70–80 million over 5 years. If unquantified benefits could also be valued, it is likely that the net benefit would be significantly higher.

1. INTRODUCTION

1.1. The Regulation

The Department of Environment and Conservation (DEC) has prepared a draft Regulation to control and regulate the storage of petroleum products (including waste oils) in underground petroleum storage systems (UPSS) in NSW. Leaking UPSS can cause harm to the environment and human health and are potentially a significant source of groundwater contamination. Clean up of contaminated areas can be extremely costly, technically difficult and time consuming.

The proposed Regulation focuses on a preventative approach to minimise the risk of soil and groundwater contamination. Its objective is to reduce the environmental risks and harm caused to human health from leaking UPSS.

The main elements of the proposed Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005 (the proposed Regulation) are:

- A phased adoption of performance standards that are consistent with the Code of Practice, *The Design, Installation and Design of Underground Petroleum Storage Systems (UPSS)*, published by the Australian Institute of Petroleum Ltd and the EPA Victoria *2003 Guidelines on the Design, Installation and Management Requirements for Underground Petroleum Storage Systems*. The performance requirements include the:
 - adoption of leak prevention systems
 - adoption of systems for early detection of leaks
 - need for timely and consistent reporting when UPSS leaks are discovered
 - appropriate investigation of a leaking UPSS and, where necessary, the clean-up action that is required
 - implementation of appropriate operational management systems at all UPSS sites.
- Local councils must be notified when a UPSS is decommissioned so that possible site contamination can be investigated and remediated where necessary.
-
- To declare the EPA¹ as the appropriate regulatory authority for UPSS-related pollution incident reporting and for compliance with UPSS management standards for the initial 4 years.

1.2. To whom does the Regulation apply?

This Regulation will apply to persons with management and/or control of a UPSS (referred to in the Regulation as the 'occupiers' of the premises in which a UPSS is located). This might include the owner and/or the operator of the UPSS, depending on the particular circumstances in any particular case.

Underground petroleum tanks are one part of a UPSS. It is the entire system of fuel tanks and pipes involved in the storage and handling of hydrocarbons that comprises a UPSS.

¹ The Environment Protection Authority (EPA) is now part of DEC and while the EPA will be the regulatory entity for the purposes of the proposed Regulation, for ease of reference this RIS will mostly refer to DEC

According to the Australian Institute of Petroleum, 'UPSS' means: "...one or more completely or partially buried Tanks that contain or are intended to contain Product or Used Oil and includes Leak Monitoring Systems, Cathodic Protection and all Product Piping to, from or associated with the Tanks and up to the inlet port of the Dispensers."²

There are an estimated 2,700 active service station sites in NSW³, most of which have multiple underground tanks and piping. In addition, there are more than 600 fuel terminals and depots⁴ and numerous other commercial and industrial premises that may also use UPSS, such as local council depots, automotive retail and hire premises, airports and petroleum refineries. It is to these sites that the proposed Regulation will apply, except where the premises have already been licensed under the POEO Act.

There is no specific provision in the proposed Regulation to permit exemptions for hardship or remote communities from adopting the new standards. The consensus view at this point favours uniform application of the standard throughout NSW.

It is important to recognise that under the POEO Act it is an offence, in most cases, if fuel tanks are leaking or substances are escaping from a UPSS causing environmental harm (for example, the pollution of waters). While the proposed Regulation will introduce new standards for UPSS equipment and its operation, it will rely on existing notice powers and offences under the POEO Act. There will be provision for DEC to make exemptions by order, where this is appropriate, and in limited circumstances.

1.3 Consultation

In late February 2004, a draft Issues Paper was circulated to selected industry stakeholders for comment. The Issues Paper outlined the background and key issues for the proposed regulatory framework for the prevention of pollution from UPSS. The comments received helped clarify certain issues and the overall response from industry stakeholders was considered to be very positive. As a consequence of this process a draft of the proposed Regulation, together with this Regulatory Impact Statement, has been developed for public consultation.

² Australian Institute of Petroleum, The Design, Installation and Operation of Underground Petroleum Storage Systems, CP4–2002 at p.10

³ Australian Institute of Petroleum, Service Station Survey as at end 2003, www.aip.com.au

⁴ Australian Petroleum Agents and Distributors Association, www.apada.com.au

2. UNDERGROUND PETROLEUM STORAGE SYSTEMS IN NSW

2.1 The problem with underground storage of petroleum

Petroleum products stored in underground tanks in NSW include petrol, diesel, kerosene, heating oil, aviation fuel and waste engine lubricating oil. Historically, underground tanks have been single-walled steel tanks with metal pipework connecting the tank to aboveground fill points and bowsers. Over time, these components become subject to corrosion (particularly where the surrounding soil is moist) and can create holes in the tanks or piping. DEC has been involved in many instances where corrosion or breakage of a part of the underground infrastructure has resulted in petroleum leaking into the environment.

The release of petroleum through leaks and spills can contaminate the soil, groundwater, surface water and air. The *New South Wales State of the Environment 2003* identified leaking underground storage tanks as a potentially significant source of groundwater contamination. Groundwater is a very important natural resource, supplying around 11% of the total water used in NSW. This water is used for drinking, irrigation, watering stock, and for domestic and industrial purposes.⁵

The release of petroleum-based substances into the environment – some of these components are very toxic (e.g. benzene) and are highly soluble in water (e.g. methyl tertiary butyl ether or MTBE) – often results in significant impacts on groundwater and surface water ecosystems and makes the groundwater unsuitable for use. Approximately 250 compounds have been identified as components of petroleum hydrocarbons but toxicity data is available on only 95 of these compounds. At least a quarter of these are known to be either carcinogenic, toxic, persistent, or to bioaccumulate in certain circumstances.

Some of the major components of petroleum hydrocarbons that can cause significant harm to health and/or environmental damage through leaks, spills and escapes include:

- Benzene – a known human carcinogen
- Benzo[a]pyrene, benzo[a]anthracene, dibenzo[a,h]anthracene – a probable human carcinogens; gasoline mixtures and used oil have been evaluated as probable human carcinogens
- Toluene and ethyl benzene – known to be toxic to humans (affecting the liver)
- Benzene, toluene, ethyl benzene and xylenes – chronic and acutely toxic in the aquatic environment. Some compounds (e.g. benzo[a]pyrene) have the potential to bioaccumulate
- Petroleum hydrocarbons – toxic to plants. The toxicity depends on the plant species, soil type, and the actual group of compounds comprising the hydrocarbons.

Exposure to petroleum hydrocarbons from leaking UPSS most often occurs in the following ways:

- off site movement through groundwater and surface water, affecting the health of humans and other species

⁵ *New South Wales State of the Environment 2003*, Department of Environment and Conservation.

- inhalation of volatile hydrocarbon vapours that are toxic and carcinogenic
- the build up of potentially explosive levels of volatile hydrocarbon vapours in utility and storm water pipes, building basements and car parks.

Leaking UPSS also have direct financial impacts on industry. Even a low rate leak can translate to a significant quantity of lost fuel if the leak remains undetected for a long period of time. This is a direct economic loss to the UPSS owner or operator. Secondly, once a leak has been identified clean up of contaminated soils and groundwater can be extremely costly, technically difficult and time consuming, and the clean-up outcome is not necessarily assured. Thirdly, where contamination affects surrounding properties the UPSS occupier may be liable for third party damages.

2.2 The need for improved management of UPSS

The existing regulation and management of UPSS does not address the problem of leaking petroleum products adequately.

The existing occupational health and safety framework, administered by WorkCover NSW, adopts a hazard identification and risk assessment approach for the storage and handling of dangerous goods. The proposed Regulation will not replace, but will complement, existing requirements in relation to underground fuel tanks under the *Occupational Health and Safety Act 2000*.

In 1994, DEC issued *Guidelines for Assessing Service Stations Sites*, and in 1995 issued the information pamphlet *Underground Storage Tanks – What You Need to Know About Leaks and Spills*. These documents came from an acknowledgment of the high incidence of UPSS leaks, and the recognition that better management of underground storage tanks would benefit both industry and the environment. Despite the guidance provided by these documents, DEC has continued to encounter contaminated soil and/or groundwater, polluted by petroleum leaking from UPSS.

Management practices at UPSS sites across NSW are inconsistent, particularly with respect to pollution prevention measures.

In order to provide protection to the environment and human health by minimising the potential for leaks, DEC proposes to require minimum standards for the storage of UPSS, based on those used in the Australian Institute of Petroleum (AIP) Code of Practice (CP4-2002), *The Design, Installation and Operation of Underground Petroleum Storage Systems* (CP4), for all new underground fuel tanks. CP4 presently applies only to AIP members and compliance is voluntary. Some petroleum retailers and distributors have been implementing improvements in technology and management practices for new UPSS in recent years, however the extent to which this has been adopted across the industry is inconsistent. More significantly, CP4 focuses on requirements for new UPSS. It does not address potential concerns relating to existing UPSS; hence improved practices have not been widely applied to the existing stock, which, by virtue of their age and condition, pose the most significant contamination threat. Thus, widely varying standards for both the management of, and prevention of pollution from, UPSS exist across industry.

The proposed Regulation will require that all new systems (i.e. those installed after the commencement of the Regulation) meet the 'level 1' equipment standards outlined in CP4. In NSW this will generally require secondary containment for all tanks and pipes. These standards will also apply where an existing underground petroleum tank needs to be replaced or substantially repaired.

Objectives

The proposed Regulation seeks to reduce the potential adverse impacts that leaking petroleum products can have on the environment, human health, and land and water resources in NSW. This can be achieved by the development of a regulatory framework that stipulates pollution prevention and operational management requirements for the occupiers of UPSS. The requirements are aimed at the prevention and early identification of UPSS leaks and at establishing a consistent standard of environmental management of UPSS across the state.

The proposed Regulation aims to:

- reduce the occurrence of environmental and human health impacts associated with petroleum chemicals leaking from UPSS
- minimise the costs to industry associated with clean-up of land and water resources contaminated by leaked petroleum product
- reduce the burden on state and local governments of having to deal with contamination arising from leaking UPSS
- ensure a consistent minimum level of environmental management at UPSS sites.

3. ALTERNATIVE OPTIONS

A number of different approaches that could be used to improve the management and performance of UPSS have been considered. These options are detailed below, including the option of doing nothing (the 'base case').

3.1. The base case

The 'do nothing' option would maintain the existing situation where some service stations comply with all or part of CP4, and others, particularly non-AIP members, may not implement leak prevention measures or effective environmental management of UPSS. In other words, the operation and management of existing UPSS would remain largely unchanged.

This course of inaction allows leaking UPSS to continue to pose risks to land and groundwater resources, ecological systems and human health. In fact, the incidence of leaks resulting in petroleum product loss from tanks and pipes to the environment is expected to increase in the short to medium term as the existing stock of UPSS ages and deteriorates.

Under the 'do nothing' option a high incidence of leaking UPSS will continue to result in costs to both industry and the community. Industry will be faced with the multiple, and substantial, costs of lost petroleum product and remediation of contaminated land and groundwater. Ongoing costs to the community may include potential health problems, degraded quality of groundwater and surface water resources, potential restrictions on resource use, environmental degradation and devaluation of third party properties where contamination migrates offsite.

Preserving the *status quo* will not provide adequate protection of human health and the environment, and the present scenario of burdensome costs to industry and the community will continue when contamination occurs.

3.2 Development of a best practice guideline for UPSS management

A 'best practice' guideline for the management of UPSS could be developed to implement the existing CP4 code, include additional requirements for leak prevention and detection for all UPSS (new and existing) and address the issues of UPSS management and decommissioning. This would be similar to the approach that has been adopted by EPA Victoria.

The major benefit of this approach is that it would clarify DEC's expectations of good practice without the associated regulatory workload and costs to DEC of pursuing a more formal regulatory approach.

The costs to industry of complying with such a guideline are anticipated to be identical to those of complying with a regulation, since the equipment and management requirements would be the same. However, as a guideline would not be directly enforceable, some UPSS owners and operators may not undertake the necessary investment to comply with the operational standards set out in the guideline.

A voluntary industry Code of Practice (CP4) already exists, pertaining mainly to the installation of new UPSS. As CP4 is not mandatory, some members of the petroleum retail and distribution industry do not follow the recommended code. It is reasonable to expect that a voluntary guideline developed by DEC would have a similar response from the industry sector. Thus, a guideline would not ensure that suitable pollution prevention measures are adopted consistently across the industry. As a result, it could place those that do follow the guideline at a competitive disadvantage because of the additional costs involved in compliance. Essentially, a guideline will not ensure a level playing field across the industry.

A guideline is also unlikely to provide a consistent degree of protection to NSW communities in terms of their local environment and human health. Costs to the community – in terms of potential environmental damage, human health impacts and resource degradation – are anticipated to be higher if a guideline is implemented instead of a more rigorous regulatory approach.

A refined option would be to give enforceability to the guideline by implementing it within a regulation. This would be no less costly to industry than a direct regulation (since the requirements for compliance will be the same). This approach would be cumbersome in that it would require additional work for DEC in developing both a regulation (to call up the guideline) and the guideline itself.

3.3 Financial assurance and insurance

Another option for addressing the problem of leaking UPSS is to require owners and operators of UPSS to demonstrate that they have the financial resources to pay for the costs of remediation action and third party damages that can result from leaking UPSS. Financial responsibility could be demonstrated, for instance, by way of commercial environmental impairment liability insurance, the ability to demonstrate self-insurance, guarantees or the establishment of a trust fund administered by a third party.

A disadvantage of this option is that DEC can only apply it through an environment protection licence (see section 3.4). However most UPSS sites in NSW are not licensed premises.

A financial assurance scheme is not considered a viable option for reducing the range of adverse impacts described in Section 2. The focus of such a scheme is ensuring that sufficient resources are available for clean-up once pollution has occurred, rather than the prevention of pollution and reduction of risks to individuals, the community and the environment from this pollution. It does not enable the establishment of minimum standards for the design, installation, operation and maintenance of UPSS across the industry so as to prevent leaks.

An alternative to a general financial assurance scheme would be to require all UPSS occupiers to hold an insurance policy to specifically cover the cost of clean up in the event of site contamination.

The advantage of insurance (as with other financial measures) is that it puts economic incentives in place for UPSS occupiers to improve their technology, management systems and leak detection systems, as these would be the basis of determining insurance premiums. Insurance would spread the cost more broadly across the industry and theoretically would cost less to put in place for those UPSS sites that are considered to pose a lesser risk.

The cost of a requirement for insurance is likely to be greater than the costs associated with the proposed Regulation. Existing environment protection cover is generally restricted to on-site clean up (for accidental and unforeseen incidents) and off-site liabilities, with no cover available for gradual pollution such as leakage from UPSS. In order to obtain gradual pollution cover, it is likely that service stations would need to demonstrate that appropriate pollution prevention, leak detection and UPSS management systems were in place at a site. In addition to these costs, which would be similar to those of the proposed Regulation, the UPSS occupier would have to pay insurance premiums.

If insurance cover could be obtained without minimum standards of leak prevention and leak detection, then this option suffers the same failings as other forms of financial assurance. That is, it is not pro-active in preventing leaks.

For the reasons outlined above, neither financial assurance nor insurance is considered a suitable alternative to addressing the problems posed by UPSS.

3.4. Environment protection licence under the POEO Act

The POEO Act allows DEC to license particular types of premises, which have the potential to cause significant environmental harm. These premises are listed in Schedule 1 of the POEO Act. In seeking to address leaking UPSS, DEC could amend Schedule 1 of the POEO Act to include service stations and petroleum distribution depots. This would mean that these premises would require an environment protection licence issued by DEC, and this would provide a framework for DEC to introduce pollution prevention requirements relating to UPSS.

This approach has several weaknesses. It would result in greater costs to UPSS occupiers than a regulation, since they would be required to pay initial and ongoing licence administration fees in addition to funding pollution prevention measures that would be the same as those required under the proposed Regulation.

It would also require more extensive administration and would place greater demand on DEC resources than any non-licensing option. An environment protection licence would be a higher cost mechanism for improving industry performance than a regulation because the problems with leaking UPSS are essentially the same for all premises and do not require site-specific solutions.

Hence, using environmental licences to address the problems of leaking UPSS is not considered to be the most cost-effective approach for industry or the community.

3.5. Direct regulation

The proposed mechanism for reducing the risk of contamination from UPSS in NSW is a regulation under the POEO Act. The proposed Regulation will require minimum technical standards for new installations of UPSS, minimum leak detection systems for all UPSS, management requirements for existing UPSS, and will specify procedures for decommissioning UPSS. The proposed Regulation is described in more detail in Section 4.

The primary advantage of this approach over the alternatives is that it establishes enforceable minimum standards for UPSS equipment with respect to installation, management, maintenance, leak detection and appropriate assessment for contamination on decommissioning across the state, thereby ensuring greater consistency in protection of the environment and human health. It will ensure a level playing field across the industry in implementing pollution prevention measures, and has fewer costs on individual UPSS occupiers than the alternatives, while achieving DEC's objectives.

The costs and benefits of introducing a regulation and of specific provisions of the proposed Regulation are described in detail in Section 5.

4. THE PROPOSED REGULATION

The proposed Regulation prescribes pollution prevention requirements for occupiers⁶ of UPSS in NSW. This section describes the features of the proposed Regulation.

The proposed Regulation will specify technical performance standards for new and existing UPSS. It is proposed the Regulation will require that:

- the design and installation of new UPSS meet standards consistent with the best available technology and practice
- leak detection systems and environmental monitoring programs be implemented for all UPSS to prescribed minimum standards
- leaking UPSS are reported to the appropriate regulatory authority and repaired or replaced in accordance with required standards, and the extent of any associated contamination is investigated, remediated to the extent required and the investigation and remediation validated
- an operational management system be developed and implemented for all UPSS sites to ensure consistent operational standards across such sites within NSW
- appropriate standards of record keeping are set and implemented for UPSS sites (for instance, records on maintenance, monitoring, auditing and decommissioning of underground fuel tanks)
- local councils are notified when a UPSS is decommissioned (i.e. upon tank removal) and of validation confirming that no unacceptable level of contamination remains.

4.1. Requirements for new UPSS

4.1.1 Site classification and equipment standards

DEC intends to require minimum equipment standards, based on those used in the AIP's Code of Practice (CP4) *The Design, Installation and Operation of Underground Petroleum Storage Systems*, for all new UPSS. This is in order to provide comprehensive protection to the environment and human health by minimising the potential for leaks. Setting minimum equipment standards based on the use of best available technology, including the use of non-corrodible tanks, pipes and secondary containment, is consistent with the prohibition of pollution of waters under the POEO Act (thus ensuring no degradation of surface water or groundwater).

DEC is aware that some industry stakeholders are already installing secondary containment tanks and pipes for some new UPSS. DEC supports this trend, and proposes to expand on the use of best available technology to ensure consistent application across the industry by requiring that all new systems (i.e. those installed after the commencement of the Regulation) meet the 'Level 1' equipment standards outlined in CP4. In terms of the site classification system set out in CP4, this treats all sites where new UPSS are installed as Class A sites. In NSW this will generally require secondary containment for all UPSS. These standards would also apply where an existing underground fuel tank needs to be replaced or substantially repaired.

⁶ As noted earlier, the 'occupier' is the person with management and/or control of the UPSS, which might include the owner and/or the operator, depending on the particular circumstances in any case.

4.1.2 Competence in UPSS installation

As acknowledged in CP4, poor installation is responsible for many UPSS leaks. DEC is seeking to improve the standard of installation of UPSS and to ensure consistent adoption of standards to minimise the potential for future leaks.

The proposed Regulation includes requirements that the occupier of a new UPSS not use the system unless it has been installed in accordance with CP4. In general, this means that the installation procedures outlined in the Petroleum Industry Contractors Association (PICA) *Recommended Practices for the Installation of Underground Petroleum Storage Systems (excluding Aviation Fuel Installation)* (RP001/2004) are followed, competent and experienced contractors are used, and that similarly qualified third party contractors are retained to verify the standard of work performed.

There is a benefit in having an accredited standard of competencies for installation contractors. At present, however, there is no established process for recognising the competence of installation contractors. The AIP and PICA have proposed an industry-based accreditation scheme for tank installation. DEC recognises merit in this approach.

Responsibility for ensuring that installation contractors have appropriate qualifications and certification, and for keeping records relating to this, will rest with the occupier of the UPSS.

The proposed Regulation will require that equipment integrity testing (EIT), using an accredited method if available⁷, be conducted by an appropriately qualified and experienced consultant before the commissioning of a new system, immediately following any upgrade or repair and before re-use of the UPSS. Integrity testing would only be required for equipment actually repaired or replaced in existing systems, rather than the entire system. This applies current industry practice outlined in CP4.

4.2. Requirements for new and existing UPSS

4.2.1 Leak detection for new and existing UPSS

Although all UPSS installed after the commencement of the proposed Regulation will be required to meet the proposed new standards for equipment, DEC is not seeking a compulsory upgrading of all existing UPSS, since this would have significant cost implications for the industry. However, it is proposed that minimum standards for leak detection be established and applied to all UPSS, whether new or existing. The aim of this requirement is to ensure that leaks are detected as soon as possible to minimise potential environmental and human health impacts.

CP4 advocates a minimum leak detection rate of 0.76 litres/hr for UPSS. This detection rate is considered relatively high by DEC, since leaks which are occurring at lower rates than these – and which therefore may not be detected – could still cause significant environmental impacts. However, industry has expressed the view that a lower detection rate than 0.76 litres/hr cannot be reliably achieved and is likely to increase the number of false 'fail' status calls, which require on-site investigation, therefore increasing the cost burden to industry.

Given the levels achievable by available leak detection technology, DEC will work with industry and other jurisdictions to establish improved leak detection rates for UPSS. In the interim the

⁷ At present there is no accredited method for performing equipment integrity testing. However, the EPA Victoria is liaising with the National Association of Testing Authorities (NATA) on the possibility of developing an accredited method for EIT.

proposed Regulation will adopt the CP4 requirements for leak monitoring. However, it is important that leak detection rates are not seen as 'allowable' leak rates – any leak that causes harm to the environment, or has the potential to cause harm, is unacceptable.

New and existing UPSS will be required to have a primary leak detection system that is able to meet a minimum detection rate of 0.76 litres/hr for UPSS. In order to satisfy the requirements under CP4, the system would need to comprise one or more of the following: automatic tank gauging; statistical inventory reconciliation analysis (SIRA)⁸; interstitial monitoring; line leak detection for pressure piping; and groundwater monitoring. Additionally, as a secondary means of detecting leaks to the environment, the proposed Regulation mandates the installation of groundwater monitoring wells. The proposed Regulation envisages that there would be a phased introduction (over 2 years) of this requirement in the case of existing systems.

The NSW strict liability prohibition on water pollution means that the onus is on the occupier of a UPSS to ensure that at all times reasonable steps are taken to avoid any pollution of groundwater or surface water from the system.

The choice of leak detection methods will be at the discretion of the occupier. Whatever methods are selected, the occupier will be required to retain records that demonstrate that the chosen methods were designed and implemented by qualified persons and are proven to be capable of meeting the minimum leak detection rates as specified for identifying contamination.

The cost of implementing an appropriate leak detection system for existing UPSS is likely to be reasonable – e.g. the application of SIRA would cost in the range of \$20 to \$30 per tank per month. This is a very small cost compared to the potential cost of clean-up after a leak, potential criminal penalties or civil litigation for damages.

4.2.2 Duty to report leaking UPSS

In NSW there is an existing requirement under s.148 of the POEO Act to report to the appropriate regulatory authority (ARA) pollution incidents that cause or threaten material harm to the environment. Currently the ARA under the POEO Act for a service station is the local council. However, because of the intended state-wide application of the proposed Regulation, it is considered that DEC, rather than individual councils, will be more appropriate as the ARA for the initial period of implementation. DEC's role as ARA would be limited to the implementation and enforcement of compliance with the new standards under the proposed Regulation. The rationale is that there should be a single regulator responsible for overseeing the introduction of the new standards throughout NSW.

The proposed Regulation envisages that DEC will be the ARA for UPSS reporting and enforcement over the initial period of 4 years. Over this period there will be a strong emphasis on capacity building within local government in preparation for this role to be returned to local government after that time. It is not proposed that UPSS would require a licence under the POEO Act, and responsibility for all other aspects of environmental regulation of service stations would remain with local councils.

⁸ Referred to in CP4 just as *statistical inventory analysis* or SIA.

Consistent with the existing reporting requirement for pollution incidents⁹, the proposed Regulation will:

- require any indication of a potential leak (such as inventory discrepancies) to be investigated in accordance with the procedure for discrepancy or loss investigation detailed in CP4
- allow DEC to develop and approve a Leak Notification Form in order to standardise and simplify the notification process for occupiers and to ensure that the appropriate information is included
- require use of the Leak Notification Form by occupiers for notifying DEC where a leak or the escape of a substance from a UPSS causes or threatens material harm. This will ensure that the extent of contamination is investigated, and where appropriate, the regulator will require prompt clean-up action to be undertaken.

4.2.3 Environmental management plan for UPSS

CP4 currently provides some guidance on UPSS management issues (such as design and installation requirements, inventory control, loss investigation procedures, testing procedures and record keeping requirements). DEC seeks to expand on this general requirement by incorporating an obligation within the proposed Regulation for an appropriate site environmental management plan to be developed and implemented for ***all new and existing UPSS***.

The required management plan should set out details of the:

- site and occupier
- site security.

Measures for leak prevention and leak detection (including the scope and timing of monitoring actions) should include:

- a maintenance program for UPSS components
- notification procedures and contingency plans to be implemented in the event that a leak is detected
- a plan for compliance audit
- documentation and records management.

4.2.4 Record keeping

As part of improving consistency in UPSS management practices, the proposed Regulation will establish minimum standards of record keeping by the occupiers in relation to all aspects of the operation, maintenance and monitoring of UPSS. Again, these requirements will cover such matters as design and installation certification for new UPSS (including as-built drawings), equipment integrity testing results, documentation of all maintenance and repairs, SIRA and other leak detection monitoring data, the scope and findings of any leak investigations conducted, soil and groundwater contamination assessments, audit reports (where undertaken) and records of decommissioning, remediation and validation.

⁹ There is also a duty under the *Contaminated Land Management Act 1997* (CLM Act) to notify the EPA if an owner or polluter becomes aware that land is contaminated in a manner that poses a significant risk of harm. The criteria and triggers for a pollution incident under the POEO Act and significant risk of harm under the CLM Act are different. The duty to report under both Acts may of course apply in some circumstances.

All record-keeping procedures should be outlined in the management plan for the facility. Records should be kept by the UPSS occupier for a minimum of seven years after the decommissioning of the underground fuel tanks and a copy should be available on-site at all times for auditing purposes while the tanks are operational.

4.3 Notification of UPSS decommissioning.

DEC considers that there would be a benefit in local councils receiving notification of the decommissioning of individual UPSS, in order to enhance their future planning and development decision making in relation to such sites.

The presence of hydrocarbon contamination in the subsurface around UPSS is most easily assessed during the removal of tanks or other underground components. In general, it is preferable that UPSS be removed when no longer operational. However there are circumstances where it is impracticable to remove decommissioned UPSS (e.g. UPSS in building basements or under other structures where removal is impossible or dangerous to the structure).

DEC seeks to ensure that the opportunity to assess potential contamination is taken whenever a tank is removed or decommissioned at a UPSS site. Accordingly, the proposed Regulation requires that a Validation Report in relation to the land from which the decommissioned UPSS is removed be served on the local authority within 90 days of decommissioning.

4.4 Appropriate regulatory authority

As noted at 4.2.2 above, because of the intended state-wide application of the proposed Regulation, it is considered that DEC, rather than individual councils, will be more appropriate as the ARA for the initial period of implementation of 4 years. DEC's role as ARA would be limited to the implementation and enforcement of compliance with the new standards under the proposed Regulation. The rationale is that there should be a single regulator responsible for overseeing the introduction of the new standards throughout NSW. All other aspects of environmental regulation of service stations would remain with local councils.

5. COSTS AND BENEFITS

This chapter identifies the costs and benefits of the proposed Regulation and the distributional impacts it may have in NSW. The assessment is a mix of qualitative and quantitative analysis.

Costs and benefits, where quantified, are given as the difference in costs and benefits that would occur under the proposed Regulation when compared with the 'base case' that would occur if the proposed Regulation was not introduced.

5.1. Costs

The cost implications have been disaggregated into the various requirements of the proposed Regulation.

DEC is proposing a phased introduction for some parts of the proposed Regulation in order to minimise the immediate (short term) costs to UPSS occupiers. Those sections of the proposed Regulation that may require capital outlay on existing UPSS sites will have a deferred commencement date (specified in the relevant sections below) to allow these costs to be phased in gradually. This applies to the requirement for a primary leak detection system, a groundwater monitoring system and the development of a management plan for existing UPSS sites.

5.1.1. Design and installation of all new UPSS to comply with Level 1 equipment as outlined in CP4

A minimum standard of UPSS equipment will ensure a consistent standard of pollution prevention equipment across the petroleum distribution and retail industries and ensure best available technology is adopted to prevent contamination from leaking UPSS. At present, outdated technologies can be installed by some UPSS occupiers. As described in section 2, this creates potential risks to human health and the environment and can have major financial impacts on individual site owners where contamination occurs.

Current industry practice varies with respect to new installations. For example:

- AIP members (including the major oil companies) reportedly install UPSS with secondary containment on most new sites, although this is not mandatory under CP4.
- Woolworths, one of the larger independent chains, reports that it installs tanks with secondary containment at all new sites¹⁰.
- The practices adopted by smaller independent owners/operators are not known and are likely to be variable.

The proposed Regulation will require minimum equipment standards for all new UPSS. It will not require an upgrade of existing UPSS to meet the equipment standards for new systems, primarily because this would have significant cost implications for industry.

This requirement will increase costs for service station owners in cases where new UPSS would not otherwise have been installed with Level 1 equipment.

¹⁰ Woolworths Plus Petrol and MTBE, from the Woolworths website (www.woolworthslimited.com.au/news/factsheets)

There should be no significant additional costs for AIP members or the larger independent chains, since these companies already install systems with Level 1 equipment as a matter of practice.

The requirement may increase equipment purchase costs for those independent service stations that do not routinely utilise Level 1 equipment for new installations, either at new sites, expansion of an existing site or replacement of an existing UPSS.

It is difficult to estimate the total costs to industry of complying with this part of the proposed Regulation as there is a high level of uncertainty in the numbers of service stations that already install new UPSS with Level 1 equipment. Furthermore, it is difficult to estimate the frequency with which new systems will be commissioned or existing systems replaced across the industry (i.e. the volume of new installations).

The difference between Level 1 and Level 3 (the least stringent equipment requirement defined in CP4, hence a conservative case for assessing additional costs) is the additional requirement for secondary containment for tanks and piping. The intermediate case, Level 2, requires secondary containment for piping but not tanks. Therefore, the estimated costs of installing Level 1 equipment rather than Levels 2 or 3 (as defined in CP4) are based on the following:

- The additional purchase cost for a 40,000-litre fibreglass tank with secondary containment compared to an equivalent size single-walled steel tank is approximately \$4,900.
- The difference in purchase cost for piping with secondary containment rather than piping without secondary containment is \$20–45 per metre of pipe. It is estimated that each tank requires approximately 15 m of pipe, which translates to an additional cost of \$500.
- It is assumed that there are no major differences in installation costs between different equipment levels.
- Level 1 equipment in CP4 also has a requirement for a groundwater monitoring system at sensitive sites. However the additional costs associated with a requirement for groundwater monitoring are discussed separately in section 5.1.4.

The additional up front costs to industry from this part of the proposed Regulation are therefore estimated to be approximately \$5,400 per tank. Total costs for a service station would be within the range \$0–27,000. This range can best be described as follows:

- The maximum cost in this range would apply in the development of a large new service station site (assuming 5 underground tanks each of 40,000L capacity) where the occupier would otherwise have installed tanks and piping without secondary containment. This additional cost reduces by \$3,500 if the occupier would have installed Level 2 equipment (i.e. secondary containment for piping but not tanks). There will be no additional cost to UPSS occupiers who are not installing new or replacement tanks or who would otherwise have installed tanks and piping with secondary containment.

5.1.2. UPSS installation, modification and repair of new and existing UPSS

Conducted by appropriately qualified and experienced person

This requirement aims to reduce the risk of leaks, which arises from poor installation of UPSS.

This requirement is unlikely to result in additional costs to UPSS occupiers since experienced installers are already being used as a matter of practice. AIP and PICA have also been working towards establishing an industry-based accreditation scheme for UPSS installers.

Occupiers will need to be able to demonstrate that an appropriate installer has been used. Costs associated with this part of the Regulation are summarised in Table 1.

Standard of repair

The aim in specifying a minimum standard of repair is to prevent the occurrence of leaks arising from ineffective or inadequate repair work.

This requirement only translates as an additional cost where repair of a UPSS would have constituted a 'band aid' approach rather than an effective fix. The number of repair jobs in this category is expected to be small since the greatest cost of repair is digging up the tank, rather than repairing the leak. The costs of this requirement will therefore be minor.

Ensuring the integrity of newly commissioned UPSS

It is important to verify the integrity of UPSS prior to use to ensure that installation/modification/repair has been successfully completed and therefore that the system is not leaking upon its commissioning.

Tanks with Level 1 equipment can typically be assessed after installation at no additional cost to the occupier of the UPSS, using an instrument that indicates whether the secondary containment is under pressure. Alternatively, actual UPSS integrity testing can be used to provide confirmation for the occupier that the system is 'tight' and is operating to design specifications. Integrity testing prior to commissioning is already common practice across the industry and is recommended in CP4.

The requirement for UPSS integrity tests will only translate as an additional cost to industry where a newly commissioned system would not otherwise have been tested. It is estimated that the additional costs for service stations that would not have otherwise performed integrity tests would be approximately \$1,130 per tank (including associated pipework) and/or \$200 per suction line, and would be applicable at such time as a system is commissioned. The number of service stations that would incur this as an additional cost as a result of the proposed Regulation is likely to be small.

In preparing the proposed Regulation, DEC considered including a requirement for periodic UPSS integrity testing, in addition to the above scenarios, which would probably provide greater certainty about the condition of the underground system at all sites and greater assurance that the UPSS was functioning without leaks. However, to minimise additional operational costs to UPSS occupiers, and in view of other requirements such as for leak detection, periodic UPSS integrity testing is not a requirement of the proposed Regulation.

5.1.3. Primary leak detection system for all UPSS

The requirement for a minimum standard leak detection system for all UPSS will promote the early identification of leaks, which will reduce the risk of soil and groundwater contamination.

This requirement will impose additional costs for occupiers of current UPSS that do not have an appropriate system for detecting leaks, or new UPSS that would otherwise have been installed without an adequate leak detection system. It is difficult to estimate the total number of UPSS in NSW in relation to which additional costs will be incurred as a result of this requirement. Some UPSS, particularly recently installed systems, already have some kind of leak detection system in place and will therefore be in compliance with this part of the proposed Regulation, provided they can demonstrate that they are capable of meeting the minimum detection rate. It is worth noting that leak monitoring for product piping is recommended for all three equipment levels in CP4.

The costs involved with installing a leak detection system will depend on the choice of leak detection method and will be determined partly by the number of underground tanks and pipes at a site. The method chosen will be at the discretion of the UPSS occupier provided it meets the minimum standard leak detection rates.

There are several leak detection methods available that may be capable of meeting the requirements of the proposed Regulation. Estimates of the costs for purchase, installation, operation and maintenance of three leak detection methods that are anticipated to be the most commonly adopted by UPSS occupiers are provided below, although there may be others that are adequate for meeting the requirements of the proposed Regulation. It is assumed UPSS occupiers will adopt the most cost effective method.

The commencement of the requirement for a primary leak detection system will be deferred in relation to existing UPSS for twelve months from the commencement of the proposed Regulation.

Statistical Inventory Reconciliation Analysis

Statistical Inventory Reconciliation Analysis (SIRA) is a relatively low cost mechanism for monitoring leaks from a UPSS based on the statistical analysis of inventory records. SIRA covers a range of computer-based programs, which have been developed to identify sources of stock gains and losses through analysis of inventory records. The technique requires a minimum number of inventory data points to evaluate any fluctuations in the levels of product in a UPSS. It is suitable for new and existing UPSS and does not require any capital investment or modifications to existing UPSS. It uses data that should already be collected at UPSS sites (such as daily dip data, sales and delivery information).

The primary costs associated with SIRA are in the analysis of inventory data. Some of the major oil companies have purchased/leased a data analysis system from a service provider at a cost of approximately \$20–25 per tank per month, and undertake the inventory analysis internally. Alternatively, UPSS occupiers can choose to have the analysis performed by the service provider. DEC is aware of two service providers in the Australian market and it is anticipated that other providers may enter the market in response to increased demand arising from a requirement for leak detection. This may in turn lower the prices for industry.

The current providers offer a range of costs (prices) for performing SIRA, depending on the number of UPSS and the form in which the inventory data is supplied. The current 'shelf price' (maximum cost) is approximately \$35 per tank per month. This price diminishes as delivery format of the data improves (for example, where a UPSS occupier inputs inventory data into a computer spreadsheet supplied by the SIRA provider, the cost per tank decreases). The cost to companies who have large networks of UPSS, such as major retailers and distributors, is approximately \$20–30 per tank per month.

There are typically no installation costs associated with SIRA for a UPSS site, provided the site already has an appropriate manual or automatic tank dip meter. However, in order to ensure that SIRA is operated effectively, training of individual site operators may be required in some cases. The current service providers can offer training and an operation support kit, costing in the range \$0 to \$650 depending on the circumstance.

Automatic tank gauging

Automatic tank gauging (ATG) is suitable for installation in new and existing UPSS, as either an automatic monitoring device or as an extension of a SIRA system. It can be set up as either a 'smart' or 'dumb' system, depending on whether gauging is continuous, and operated automatically or intermittently and manually-directed.

Purchase and installation costs associated with retrofitting an ATG system are estimated to be in the range \$11,000 to \$32,500 for a 4-tank UPSS. The amount will depend on the type of system used and how easily the system can be installed at a specific site (for instance, whether concrete needs to be broken and replaced at a site).

The operational costs of ATG are minimal, requiring only a small amount of labour depending on the type of system.

Secondary containment with interstitial monitoring

This technique only applies to installations that have secondary containment systems. Interstitial monitoring is not a mandatory part of Level 1 equipment as outlined in CP4, but is an additional installation.

Interstitial monitoring is a leak detection system installed in the interstitial space between the inner and outer layers of the tank or piping. For example, ATG, vapour sensors or free phase sensors can be used. Hence, costs of interstitial monitoring correspond with the costs of the chosen monitoring technique installed in the interstitial space. For continuous interstitial monitoring, estimates range from \$2,400–10,000 as a one off cost depending on the system installed (increasing in price from vapour monitoring up to ATG). For a dumb system, costs would be in the range \$3,000–8,400. Operational costs of interstitial monitoring would be minimal, since it would be an automatic system that sets off an alarm whenever a leak was detected.

5.1.4. Groundwater monitoring system for all UPSS

The requirement for a groundwater monitoring system to be implemented for all UPSS will provide a secondary means of detecting leaks into the environment. Because primary leak detection systems such as SIRA are not foolproof, groundwater monitoring will further reduce the risk of serious contamination.

Environmental monitoring may also identify contamination in the environment that arises from leaks smaller than 0.76 litres/hr (the specified minimum leak detection capability) that may remain undetected for a period of time. This will allow action before any impact becomes more widespread, which will be particularly important in sensitive areas where groundwater and surface water resources may be impacted.

Some service stations already have groundwater monitoring wells established. In these cases there will be no additional equipment cost associated with this requirement provided the existing wells are capable of detecting the presence of contamination arising from any part of the UPSS.

Installation costs for groundwater wells will depend on the depth of groundwater and local geology. An effective monitoring system is likely to comprise a minimum of three groundwater wells. Cost estimates provided by environmental consultants indicate that installation costs for three groundwater wells at a site to a depth of 5 m are in the range \$5,500 to \$6,500 (provided drilling through rock is not necessary). If groundwater is encountered at shallower depths than 5 m then these costs would be reduced.

Monitoring costs will include regular sampling and analysis of groundwater, and will be an additional cost for all service stations that do not currently undertake regular groundwater monitoring. The proposed Regulation will require groundwater sampling and analysis to be undertaken quarterly. Annual monitoring costs are approximated at \$2,200 per service station, based on the following assumptions:

- groundwater sampling and analysis to be performed by an independent consultant and external laboratory (would be 10–15% lower if performed by an external commercial laboratory)
- minimum of four samples (three wells and one QA/QC sample) per sampling event, at \$70 per sample
- sampling and reporting requires a total of four person-hours per site per sampling event, at \$90 per hour (for a junior engineer/scientist)
- four sampling events annually.

Large and complex UPSS sites may require more than the assumed three groundwater wells, in which case installation and monitoring costs will increase accordingly.

This requirement of the proposed Regulation will commence immediately for new UPSS, however there will be a deferred commencement of 2 years for existing UPSS.

5.1.5. Management plan for all UPSS

A dedicated and accessible management plan for UPSS sites will clarify minimum environmental management requirements, including day-to-day operation of UPSS sites, which will assist in minimising the potential environmental impacts from a site.

Where UPSS occupiers do not already have a management plan in place, the additional costs of this requirement are associated with plan preparation. For example, expert consultants may need to be engaged, particularly by small companies and independents or other service stations that lack the internal expertise or resources to prepare such plans.

It is estimated that this requirement may cost around \$2,200 (based on an assumption of 3 days work at \$90 per hour) for the preparation of such a plan if an external consultant is required. The cost may be less for larger petroleum companies who are more likely to have in-house capabilities to prepare these plans, and who can benefit from size economies in preparing template plans which can then be tailored for individual sites.

This cost estimate may be diminished significantly if petroleum industry bodies – particularly those representing independent service station owners – assist UPSS occupiers by developing some form of ‘template’ UPSS management plan. This could be distributed to individual members who can then tailor the plan to fit the requirements of their site.

The commencement of the requirement for a management plan will be deferred in relation to existing UPSS for six months from the commencement of the proposed Regulation.

5.1.6. Record keeping requirements

A minimum standard of record keeping will assist occupiers in documenting compliance with the proposed Regulation and will ensure information is available on UPSS operation and decommissioning.

Any additional cost associated with this requirement is likely to be a one-off cost, in compiling existing records and setting up a file for ongoing record keeping. For the purposes of estimating the cost impact of this part of the proposed Regulation, it is assumed that four additional hours of work by the UPSS occupier will be required initially. A nominal estimation is therefore made at \$110 set up cost (assuming a \$27/hr labour cost is involved).

Requiring a minimum standard of record keeping is unlikely to significantly increase the time or resources presently devoted to this activity. CP4 already recommends some degree of record

keeping and it is anticipated that the majority of UPSS occupiers have adopted at least basic record keeping practices. For instance, inventory data (such as information on deliveries and sales) should already be kept by most, if not all, UPSS occupiers.

5.1.7. Requirements for leaking UPSS

Investigate loss of fuel

The requirement that all suspected fuel losses are investigated aims to ensure that leaks are correctly and promptly identified.

This requirement translates as an additional cost only where UPSS occupiers would not otherwise have investigated the source of a fuel loss. This is anticipated to be a very small proportion of occupiers, if any, since there is an obvious financial incentive already to determine whether and how fuel is being lost.

Report identified leaks or contamination to the ARA

The proposed Regulation will require all confirmed leaks greater than 0.76 L/hr to be reported to the ARA using a DEC approved leak notification form. This requirement is broadly consistent with an existing requirement under Part 5.7 of the POEO Act to report 'pollution incidents'. However the proposed Regulation is more explicit in specifying a rate of leaks per hour. Leaks above this rate are to be reported because of the widespread contamination arising from leaking UPSS.

The provision of a leak notification form will assist UPSS occupiers to notify the ARA when a leak occurs and ensure that the necessary information is made available. It will also ensure that UPSS occupiers report pollution incidents. This reduces the risk of them incurring a fine as, otherwise, the pollution incident may not have been reported.

It is not anticipated that this requirement will impose any major costs on UPSS occupiers. A nominal estimation of costs is made at \$30 per leaking tank, based on an assumption of an additional one-hour's work that would be required to complete the notification form and submit it to the ARA.

Replace or repair any leaking UPSS

The aim of this requirement is to ensure that leaking UPSS do not remain unattended and thereby continue contaminating the environment.

This requirement imposes an additional cost only where a UPSS occupier would not normally repair or replace a leaking system. As with the loss investigation, this is expected to represent only a very minor component, if any, of the petroleum industry because of the financial incentive to prevent ongoing fuel loss and the cost of clean up.

The decision whether to repair or replace a leaking UPSS will be at the discretion of the occupier. Any repair work must meet the minimum requirements outlined in CP4 section 9 and replacement of UPSS equipment must comply with the requirements for equipment integrity testing set out in CP4 section 8.5.

Investigate contamination of the environment, remediate and validate

It is important to confirm that a leak has not adversely impacted the environment and has not contaminated a site in such a way that it is no longer suitable for its intended use.

The type of investigation used to determine whether a leak has impacted the environment may include:

- visual inspection and sampling of surrounding soils during repair of the UPSS to assess whether there is any impact caused by leaked fuel product
- analysis of groundwater samples taken from the existing groundwater wells to assess whether groundwater quality has been impacted.

Irrespective of the proposed Regulation, remediation will be necessary once contamination is identified at levels that indicate a site is unsuitable for its intended use. Thus, including a specific requirement for remediation where contamination poses a risk to users of a site or to neighbouring properties and ecosystems does not impose an additional cost on UPSS occupiers. Indeed, early identification of contamination and action to address potential risks is likely to mean reduced remediation costs.

Validation refers to sampling of soils and/or groundwater (as appropriate) to confirm that levels of contamination are acceptable and consistent with the objectives of the remediation. A validation report would include analytical results from sampling to demonstrate that remediation has been successful. There may be some additional costs for UPSS occupiers to submit a validation report to the ARA, however these cannot be quantified.

5.1.8. UPSS decommissioning

Notification of abandonment or removal of UPSS

The requirement for UPSS occupiers to notify the ARA where all or part of a UPSS is to be abandoned *in-situ* or where the tank is to be removed will involve additional reporting time and costs. These costs are not expected to be significant and have been estimated to be approximately one hour at \$27/hour.

Investigation of contamination, remediation and validation

The investigation of contamination, and the remediation and validation of a leaking decommissioned UPSS will be an additional cost to some occupiers and not others. For example, the decommissioning may be part of a redevelopment of the site which requires approval under the planning process. It would probably be a requirement of the approval that the site be investigated for contamination, remediated if warranted and validated. In that case, the action (and associated costs) required by the proposed Regulation will be something that the planning process requires in any event. There will be other cases where the decommissioning will **not** be subject to the planning process. In those cases, the proposed Regulation can be regarded as imposing additional requirements and costs. The actual costs of this component of the proposed Regulation cannot be determined.

In general terms, the average cost of a basic service station investigation, where the site geological and hydrogeological conditions are not complex and the contamination is confined, is approximately \$20,000. This would normally include soil boreholes, groundwater wells (3–4), sampling, analysis and a report. Where groundwater is deep or the geology is difficult or groundwater is wide spread, the cost of investigation will increase significantly. Section 5.2.1 provides additional cost figures for the remediation of service station sites.

5.1.9. Appropriate regulatory authority

As described in Section 4.4, the introduction of the proposed Regulation will not alter the role of local councils as the appropriate regulatory authority (ARA) for most UPSS sites, including service stations. Hence it is anticipated that there will be no additional resource implications for councils in undertaking this role.

The proposed Regulation may in fact assist councils better in regulating UPSS sites as it establishes a clear set of requirements for these sites and provides documents and reporting mechanisms that can be used by councils to determine the status of each UPSS under its jurisdiction.

5.1.10. Summary of Costs

The estimated costs of the proposed Regulation are summarised in Table 1.

Table 1: Costs of the proposed Regulation

Requirement	Costs	
	Range (\$)	Estimate (\$)
New UPSS		
Complies with Level 1 equipment standards	0–27,000	5,400 per tank
New and Existing UPSS		
Appropriately qualified and experienced installers	No cost	No initial cost
Minimum standard of repair	not quantified	
Confirm integrity of UPSS prior to commissioning	1,110	1,110 initial cost/repaired tank
Primary Leak Detection System (SIRA, no training)	300–480	420 per tank/year
Groundwater monitoring:		
• installation	5,500–6,400	6,000 initial cost/service station
• monitoring	2,000–2,200	2,200 cost/service station/year
Management Plan	2,200	2,200 initial cost/service station
Record keeping requirements	110	110 initial cost/service station
Leaking UPSS		
Investigation of loss of fuel	not quantified	
Notification of identified leaks to the ARA	27	27 per leaking tank
Repair or replacement of leaking UPSS	not quantified	
Decommissioning of leaking UPSS		
Notification of abandonment in-situ or removal	30	307 per decommissioned tank

Assuming 2% of UPSS leak each year, the present value of these costs over 5 years is between \$30 m and \$40 m (actual figures rounded – see Appendix 1 Tables A3 and A4)

5.2. Benefits

The proposed Regulation benefits industry, the community and the environment by decreasing the potential for soil and groundwater contamination. These benefits are discussed below in terms of benefits for industry and benefits to the community and the environment.

5.2.1. Benefits to industry

Introduction of the proposed Regulation will have the following benefits to industry:

- reduced investigation and clean-up of contamination, including fewer disruptions to business operations which can occur where extensive remediation is required
- avoided potential for litigation arising from contamination of groundwater and offsite (third party) properties
- reduced loss of fuel product by early detection of leaks
- minimised restrictions on future land use that may occur where extensive remediation is required (over a long period of time) to clean up a contaminated site and surrounds
- ensured consistency across the petroleum industry in the level of pollution prevention, which will allow competition for all individual retailers or distributors.

Reduced investigation and remediation of contamination

Remediation costs associated with clean up of service station sites where leaking UPSS have contaminated the environment are extremely variable. The nature and scale of clean-up can depend on factors such as the type and quantity of leaked product, the lateral and vertical extent of contamination, the subsurface environmental conditions (e.g. hydrogeology, soil type and permeability, suitability of conditions for natural degradation of hydrocarbons), the proximity to sensitive receptors and the availability of appropriate remediation technologies.

DEC's *Guidelines for Assessing Service Station Sites* estimates typical costs for remediating contamination range from \$11,000 to more than \$210,000, depending on the extent and duration of clean up. Environmental consultants have previously indicated that typical remediation costs for small to medium sites with some soil contamination and no offsite migration of product or groundwater contamination could be estimated in the range \$43,000 to \$54,000. For more complex sites with extensive soil and groundwater contamination, sensitive receptors nearby and/or offsite migration of contaminants, remedial costs may be much higher, in some cases hundreds of thousands of dollars. A US study found that the average cost of cleaning up a contaminated site is US \$125,000, and over US \$1 million if the contamination has reached the groundwater¹¹.

Preventing leaks and monitoring and early detection of leaks minimises the potential for widespread contamination and avoids expensive clean-up operations. A value of \$100,000 per leaking tank is considered a conservative estimate of the potential benefit or avoided clean-up costs for a service station site.

¹¹ Kahaner 1998

Avoided potential for litigation and third party damages

There are numerous cases in NSW of litigation arising between UPSS occupiers and regulatory agencies over contamination disputes. This is a direct financial cost to industry and to government (and therefore the community).

If neighbouring property owners were able to prove leaking UPSS had contaminated their groundwater, potential costs of litigation and third party damages for service-station owners could be hundreds of thousands, even millions of dollars. A former neighbour of a service station in Washington D.C. was awarded nearly US \$2.5 million for expenses and 'savings opportunities lost' when the property lingered on the real estate market after the service station was found to be negligent in remediating contamination from leaking underground storage tanks¹².

The proposed Regulation will minimise the likelihood of litigation from leaking UPSS, by reducing the potential for significant soil and groundwater contamination. This could avoid approximately \$100,000 per litigation case, which can be assumed to occur for approximately 10% of leaking tanks.

Reduced loss of fuel product

The proposed Regulation requires all service stations to install a leak detection system that is capable of detecting fuel leaks greater than 0.76 litres/hour. The benefits of this requirement in terms of reducing the amount of fuel lost by early detection of leaks can be assessed by calculating the value of fuel that would be lost if the leak was undetected. Note that this basic calculation will underestimate lost fuel costs, as many tanks would have leaks at a greater rate than 0.76 litres/hour.

If the price of fuel is assumed to be 95c/litre, then detection of a leak at 0.76 litres/hour would save a UPSS occupier approximately \$18 per day. This translates as a significant benefit to industry. If there are 10,000 tanks in NSW and 1–2% of these leak each year, the avoided cost of this requirement could reach \$2.1 million in the first two years (assuming tanks had been leaking for 1 year), and \$11,500 for subsequent years (assuming it takes 3 days to stop identified leaks).

Ensuring consistency (a 'level playing field') across the petroleum industry

In the absence of a mechanism for consistent environmental management, UPSS occupiers that do not voluntarily adopt environment protection measures may gain a competitive advantage over occupiers that do pursue pollution prevention because of the initial financial costs associated with improving environmental management.

To prevent pollution without disadvantaging individual retailers or distributors, the proposed Regulation will assist industry in ensuring that a consistent level of equipment design and site management practice is adopted across NSW.

¹² Schultz 1999

5.2.2. Benefits to the community and the environment

The release of contaminants into the environment can result in a reduced quality of water resources and contamination of land. Toxic chemicals, such as some petroleum constituents, introduced into the environment may also have adverse effects on human and ecosystem health. The avoidance of these impacts translate into identifiable benefits for the community and the environment.

Quality of water resources preserved for current and future users

The then Department of Land and Water Conservation (now Department of Natural Resources) (DLWC) identifies groundwater as an important commodity in NSW and a vital component of both rural and urban industries. For instance:

- more than 530,000 megalitres of groundwater are used each year across the state for agricultural and stock purposes
- more than 130 communities extract 60,000 megalitres for urban use
- an unknown amount of groundwater is used for private, domestic purposes.

If groundwater is contaminated it affects useability of the resource, particularly for sensitive uses such as drinking water or agricultural supply which are precluded at even low levels of contamination. In some cases, groundwater quality may be damaged irreparably or may require some form of additional treatment prior to being used.

Degradation of groundwater quality therefore translates into a direct or indirect cost to groundwater users and the community. DLWC has reported that the degradation of groundwater quality in some areas of the state is beginning to translate into economic and environmental losses¹³.

For example, where groundwater extracted for, say, agricultural supply is contaminated an alternative supply must be found. This imposes costs on the agricultural activity, including time lost in locating an alternative water supply, disruption to agricultural activities if a clean water supply is unavailable, and costs associated with negotiating use of a new supply of water.

In addition to impacts on groundwater quality and use, leaking UPSS can affect the quality of surface water such as creeks and estuaries. Potentially sensitive uses of surface waters in NSW include drinking supply, agricultural supply and recreational uses such as swimming and fishing. These uses may be precluded where contaminated groundwater is affecting surface water quality. There is a case in northern NSW where a leaking UPSS has contaminated a creek used by the local community for drinking water purposes. In this case, public money was expended to rectify the problem and ensure a clean source of water is supplied to the community.

The introduction of minimum standard pollution prevention and leak detection measures will enhance protection of the quality of water resources in NSW. It will reduce the likelihood of contamination affecting both the current and future use of groundwater and surface water resources.

¹³ DLWC, Water Reform Fact Sheet, *Groundwater Management*, August 1997

Reduced land value/amenity

Properties may decrease in value where they are affected, or perceived to be affected, by contamination. Since it is not always possible to remediate contamination, particularly where groundwater is impacted, affected properties may not regain their original value. Hence contamination directly impacts on land owners and the local community through reduced real estate prices. Even where remediation is possible it often involves significant disturbance to affected properties.

A lawsuit filed in Massachusetts, US, alleged that releases from UPSS have caused billions of dollars in damages to nearby property owners¹⁴. In New York, USA, a study of homes found to have groundwater contamination including benzene, toluene, xylene and low levels of MTBE, found that the values of properties were reduced by at least 20%. In NSW, this translates to a loss of \$75,000 per contaminated (or perceived to be contaminated) property (assuming a median house price of \$385,000¹⁵). It is estimated that the Regulation would avoid this cost in approximately 10% of leaking tank cases.

Land devaluation due to contamination will be minimised in conjunction with the prevention of leaks from UPSS. The avoided loss on real estate prices can therefore be included as a benefit of the proposed Regulation.

Improved safety for underground infrastructure workers

The release of petroleum through leaks and spills can create explosive risks, particularly for underground infrastructure such as stormwater drains, service trenches and other tanks. This was demonstrated by a recent case in NSW, where leaking fuel from a service station site caused an explosion in the sewer line immediately adjacent to the site. Council workers were in the process of installing a new connecting sewer line when a spark triggered an explosion along the existing line, blowing off manholes. This kind of incident represents a risk to the health and safety of workers in the vicinity of the explosion. The costs associated with this incident included emergency responses by the Fire Brigade and WorkCover NSW, as well as significant costs of infrastructure repairs and clean up.

By minimising the occurrence and impacts of UPSS leaks, the proposed Regulation will reduce the risk of explosions and thereby improve worker safety, reduce the costs of emergency response, infrastructure repair and associated administration costs.

Reduced risks to human health

Humans may come into contact with petroleum products leaked from UPSS in the following instances:

- Residents of properties onto which or beneath which petroleum contamination has migrated (either as separate phase product or in groundwater) may be exposed to volatilised contaminants, by inhalation.
- Users of contaminated groundwater may ingest contaminants (if used as drinking water supply) or have dermal contact with contaminants.

¹⁴ Alabama A&M and Auburn Universities website (www.aces.edu/departments/extcomm/broadcast/leaky) EPA *Targets Leaky Underground Storage Tanks As a major Groundwater Problem*.

¹⁵ Real Estate Institute of NSW, June Quarter 2004, Median house prices across NSW (www.reinsw.com.au)

- Recreational users of surface water bodies that have been impacted by the discharge of contaminated groundwater may ingest, and/or have dermal contact with, contaminated waters.

Benzene is a known human carcinogen and exposure to benzene vapours, for instance, can have adverse health effects. Acute exposure can lead to skin and eye irritations, drowsiness, dizziness, headaches, and vomiting, while chronic exposure can be carcinogenic and can affect normal blood production and be harmful to the immune system. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) reports that *“as benzene is an established human carcinogen for which no safe level of exposure has been established, it is recommended that any increase in public exposure be avoided and that measures be taken to reduce exposure where this is practicable.”*¹⁶

The health risks posed by some other chemicals in petroleum products, such as MTBE, and by chemical mixtures are less certain. It is difficult to meaningfully quantify the benefits to human health from reducing exposure to these chemical products. Health effects cannot always be directly observed, and in the case of chronic exposure it can be very difficult to correlate source, exposure and effects. The DLWC has identified that contaminated groundwater has, in numerous cases, posed serious threats to human health.¹⁷

Nonetheless, minimising potential exposure to leaked petroleum contaminants and thereby reducing the risk of adverse health impacts is an important beneficial outcome that will accrue from the introduction of the proposed Regulation.

5.2.3. Summary of Benefits

Table 2 summarises the estimated benefits of the proposed Regulation.

Table 2: Summary of benefits from proposed Regulation

Benefit (Avoided Impact)	Value	
	Range	Estimate
Clean-up and remediation costs	\$110,000–\$200,000	\$110,000 per site
Litigation and Damages	\$0–millions	\$110,000 per site
Fuel loss/tank	-	\$20 per leaking tank/day
Minimise restrictions on future land use	not quantified	
Consistency across the industry	not quantified	
Quality of water resources	-	\$55 per ML/leaking tank
Reduced land value/amenity	-	\$77,000 per leaking site
Improved safety for workers	not quantified	
Reduced risk to human health	not quantified	

Assuming 2% of tanks leak per year, the present value of these benefits over 5 years is \$110 m (actual figure rounded – see Appendix 3 Table A5).

¹⁶ The National Industrial Chemicals Notification and Assessment Scheme (NICNAS), *Benzene, Priority Existing Chemical Assessment Report No.21* September 2001

¹⁷ Department of Land and Water Conservation, Water Reform Fact Sheet, *Groundwater Management*, August 1997

5.3. Distributional Impacts

It is clear that the benefits of the proposed Regulation exceed the costs. The impact of costs and benefits can fall disproportionately within the community. The distribution of costs and benefits from the proposed Regulation are outlined below:

- The proposed Regulation will benefit the people of NSW, as the reduced risk of contamination will protect human health and improve environmental quality. There are also benefits from better management of petroleum products in UPSS and reduced loss of this resource.
- Non AIP members, particularly the independent service stations, will be the group most significantly affected by the proposed Regulation. These service stations are more likely to have management procedures that do not meet CP4. This means that meeting the requirements of the new Regulation will increase costs significantly. However, the costs associated with upgrading UPSS to meet the proposed Regulation can be seen as an investment, as the significant cost that may have occurred in the future can be avoided. The proposed Regulation may also prevent new independent service stations from entering the market, as the initial start up costs will increase significantly due to the minimum equipment level standards. This could result in oligopoly behaviour by larger companies.
- It is anticipated that some of the additional costs to service station occupiers could be passed on at the retail level to the community, to the extent that competition in the marketplace permits the price of petrol to rise. This price increase could have an impact on persons that consume large quantities of petrol (e.g. for business or in non-metropolitan areas where residents may need to travel large distances to access basic services), however this is unlikely to be widespread.

6. ANALYSIS AND CONCLUSION

6.1. Assessment of the proposed Regulation

The costs and benefits of the proposed Regulation have been quantified where possible, and have been assessed over a 5-year timeframe (life of the Regulation) using a discount rate of 7%. Analysis of the costs and benefits required many assumptions to be made because of the lack of certainty in current equipment levels and management practices of service stations in NSW. Details of the assessment are contained in Appendixes 1–3.

The total costs of the proposed Regulation have been estimated to be within the range of **\$30 million to \$40 million** over a 5-year period. This relates to industry costs and is based on estimates of the number of service stations that do not currently have equipment that would comply with the proposed Regulation.

The best estimate of the benefits of the proposed Regulation is rounded to **\$110 million**. This relates to benefits to industry and the wider community as described in Section 5.

The quantified net benefit of the proposed Regulation is therefore rounded to \$70–\$80 million over 5 years. The actual benefits from the proposed Regulation are expected to be significantly higher than this, if all the unquantified benefits were included, particularly health impacts and recent increases in the price of oil and petroleum products.

6.2. Conclusion

Leaking UPSS are potentially a significant source of groundwater contamination, and remediation can be extremely costly, technically difficult and time consuming. The proposed Regulation takes a preventative approach to control leaks from UPSS in NSW.

The objective of the proposed Regulation is to reduce the potential environmental and human health risks from UPSS by ensuring prevention and early detection of leaks, reporting and investigation of leaks and implementation of appropriate operational management systems at all UPSS sites.

The proposed Regulation would require occupiers of service stations to undertake regular tests of their tanks for leaks and improve their practices in relation to day-to-day environmental management.

While there will be some up-front costs to industry, particularly for small independent service stations, the proposed Regulation will provide a net benefit to the people of NSW. It will provide an improvement to protecting our subsurface environment, which will contribute to the better health, well being, and safety of our community.

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APPENDIX 1

Underground petroleum storage systems – regulatory impact statement analysis

Table A1: Key assumptions

Analysis undertaken over 5 years		
Total number of UPSS remains constant over 5-year period		
Number of service stations in NSW		2,700
Number of underground tanks in NSW		10,000
No. of leaking underground tanks per year (2% of total)		200
No. of upgraded underground tanks per year (80% of those leaking)		160
No. of repaired tanks per year (20% of those leaking)		40
No. of decommissioned tanks (those repaired + others unknown)		160
Owners/operators would choose most cost effective leak detection system (SIRA), and any training would be provided free		
% of UPSS that do not have (or would not have installed):	Range	
<hr/>		
Level 1 equipment standards	20%	40%
Leak detection system	40%	60%
Groundwater monitoring wells	40%	60%
Regular groundwater monitoring	40%	60%
Management plan	50%	90%
Deferred commencement		
<hr/>		
Groundwater Monitoring		2 years
Management Plan		0.5 year
Leak Detection System		1 year
<hr/>		

APPENDIX 2

Costs

Table A2: Cost estimates of the proposed Regulation

Costs	Estimate
Level 1 equipment standards	\$5,400 per tank
Qualified / experienced UPSS installers	\$0 initial cost
Minimum standard of repair	not quantified
Integrity testing of UPSS	\$1,100 initial cost per repaired tank
Leak Detection System (SIRA, no training costs)	\$420 per tank per year (\$35/month)
Groundwater monitoring: installation	\$6,000 initial cost per service station
monitoring	\$2,100 per service station per year
Management Plan	\$2,100 initial cost per service station
Record keeping requirements	\$110 initial cost per service station
Investigation of loss of fuel	not quantified
Notification of identified leaks to ARA	\$30 per leaking tank
Repair or replacement of leaking UPSS	not quantified
Notification of abandonment in-situ or removal	\$30 per decommissioned tank

Table A3: Lower range cost estimate scenario

Year	Level 1 equipment standards	Investigation Remediation	Integrity Testing	Leak detection system	Groundwater monitoring	Management Plan	Record Keeping	Notification of leaks	Notification of decommission	ARA	Total costs
2006	\$172,800	\$13,400,000	\$44,000	-	-	\$2,835,000	\$297,000	\$6,000	\$4,800	-	\$16,759,600
2007	\$172,800	-	\$44,000	\$1,680,000	-	-	-	\$6,000	\$4,800	-	\$1,907,600
2008	\$172,800	-	\$44,000	\$1,680,000	\$8,748,000	-	-	\$6,000	\$4,800	-	\$10,655,600
2009	\$172,800	-	\$44,000	\$1,680,000	\$2,268,000	-	-	\$6,000	\$4,800	-	\$4,175,600
2010	\$172,800	-	\$44,000	\$1,680,000	\$2,268,000	-	-	\$6,000	\$4,800	-	\$4,175,600
Total costs (present value)											\$32,190,183

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Table A4: Higher range cost estimate scenario

Year	Level 1 equipment standards	Investigation Remediation	Integrity Testing	Leak detection system	Groundwater monitoring	Management Plan	Record Keeping	Notification of leaks	Notification of decommission	ARA	Total costs
2006	\$345,600	\$13,400,000	\$44,000	-	-	\$5,103,000	\$297,000	\$6,000	\$4,800	-	\$19,200,400
2007	\$345,600	-	\$44,000	\$2,520,000	-	-	-	\$6,000	\$4,800	-	\$2,920,400
2008	\$345,600	-	\$44,000	\$2,520,000	\$13,122,000	-	-	\$6,000	\$4,800	-	\$16,042,400
2009	\$345,600	-	\$44,000	\$2,520,000	\$3,402,000	-	-	\$6,000	\$4,800	-	\$6,322,400
2010	\$345,600	-	\$44,000	\$2,520,000	\$3,402,000	-	-	\$6,000	\$4,800	-	\$ 6,322,400
Total costs (present value)											\$42,921,579

APPENDIX 3

Benefits

Table A5: Estimated cost benefits of the proposed Regulation

BENEFITS (Avoided costs)	Estimate
Clean-up and remediation costs	110,000 per site
Litigation and damages	110,000 per site
Fuel loss / tank ('85'48c/litre @ 0.76litres/hour)	17 per leaking tank per day
Minimise restrictions on future land use	not quantified
Consistency across the industry	not quantified
Quality of water resources	53 per ML/leaking tank
Reduced land value / amenity	77,000 per leaking tank/residential premises
Improved safety for workers	not quantified
Reduced risks to human health	not quantified

Table A6: Estimated cost benefits of the proposed Regulation over a 5-year period

Year	Clean Up / Remediation	Litigation	Fuel Loss	Quality of water resources	Reduced land value / amenity	Total Benefits
2006	\$22,000,000	\$2,200,000	\$930,750	\$10,600	\$1,540,000	\$26,681,350
2007	\$22,000,000	\$2,200,000	\$930,750	\$10,600	\$1,540,000	\$26,681,350
2008	\$22,000,000	\$2,200,000	\$10,200	\$10,600	\$1,540,000	\$25,760,800
2009	\$22,000,000	\$2,200,000	\$10,200	\$10,600	\$1,540,000	\$25,760,800
2010	\$ 22,000,000	\$2,200,000	\$10,200	\$10,600	\$1,540,000	\$25,760,800

Table A7: Total benefits (present value)

Total Benefits (present value (PV))	\$107,288,737
Total benefits is calculated based on net present value (NPV) of benefit with a discount rate of 7%	Rounded to \$110,000,000

Scenario 1 – Lower cost estimate

PV Benefits	\$107,288,737
PV Costs	\$32,190,183
Net Benefits	\$75,098,554 over 5 years
Benefit cost ratio	5

Scenario 2 – Higher cost estimate

PV Benefits	\$107,288,737
PV Costs	\$42,921,579
Net Benefits	\$64,367,158 over 5 years
Benefit cost ratio	3

APPENDIX 4

Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005



Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

under the

Protection of the Environment Operations Act 1997

Explanatory note

The object of this Regulation is to regulate, under the *Protection of the Environment Operations Act 1997 (the Act)*, the storage of fuels in underground storage systems so as to minimise the risk of the discharge of substances that cause significant damage to the environment.

The Regulation requires compliance with CP4—2002 *Code of Practice for the Design, Installation and Operation of Underground Petroleum Storage Systems (UPSS) (the Code)* published by the Australian Institute of Petroleum Ltd.

Part 1 of the Regulation contains preliminary provisions, including a limitation on the application of the Regulation and definitions of **use** a storage system and **person responsible** for a storage system.

Proposed clause 5 provides that the Regulation does not apply to:

- (a) a sump, separator, stormwater or wastewater collection system, catchment basin, pit, septic tank or other like structure (unless it is part of a storage system), or
- (b) a bunded tank situated below ground level, but not in the ground (unless it is part of a storage system), or
- (c) pipework not associated with a storage system, or
- (d) a liquefied petroleum gas storage system, or
- (e) a scheduled activity within the meaning of the *Protection of the Environment Operations Act 1997*.

Use a storage system is defined to include:

- (a) allow product or used oil to remain in the system, and
- (b) cause or permit the use of the system.

Person responsible for a storage system is defined to mean the occupier of the premises on which the system is, or is being, installed. The Act provides that the occupier of premises is the person who has the management or control of the premises.

Public consultation draft

Protection of the Environment Operations (Underground Petroleum Storage Systems)
Regulation 2005

Explanatory note

Part 2 of the Regulation makes provision for the use and modification of storage systems. That Part:

- (a) prohibits the person responsible for a new storage system from using the system unless it has been designed and installed in accordance with the Code, and
- (b) prohibits the person responsible for a storage system from using the system unless it has Equipment Level 1 (as required by the Code) (although the application of this provision is limited in respect of old systems for a certain period after the commencement of the Regulation), and
- (c) prohibits the person responsible for a storage system from using the system otherwise than in accordance with the Code (although this prohibition does not have the effect of requiring an old system to be modified to include equipment and the application of this provision is limited in respect of old systems for a certain period after the commencement of the Regulation), and
- (d) prohibits the person responsible for a storage system from using the system unless the system has groundwater monitoring wells (although this prohibition does not apply to old systems for a certain period after the commencement of the Regulation), and
- (e) imposes certain other obligations on the person responsible for a storage system, including obligations regarding environment management plans, measuring instruments and modifications.

Part 3 of the Regulation provides for the making and retention of certain records and other documents in respect of the use of a storage system.

Part 4 of the Regulation contains miscellaneous provisions, including the conferral on the EPA of the power to exempt a person from a provision of this Regulation by order in writing and a provision making it an offence to provide, in connection with this Regulation, false or misleading information.

This Regulation is made under the *Protection of the Environment Operations Act 1997*, including section 323 (the general regulation-making power) and clauses 5, 6A and 15 (1) of Schedule 2.

Public consultation draft

Protection of the Environment Operations (Underground Petroleum Storage Systems)
Regulation 2005

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Regulation 2005

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Public consultation draft

Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Clause 1

Preliminary

Part 1

Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

under the

Protection of the Environment Operations Act 1997

Part 1 Preliminary

1 Name of Regulation

This Regulation is the *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005*.

2 Commencement

- (1) This Regulation commences on [commencement date], except as provided by subclause (2).
- (2) Schedule 3.1 [2] and Schedule 3.2 [2] commence on [commencement date + 4 years].

3 Definitions

- (1) In this Regulation:

current as-built drawings, in relation to a storage system, means the version of the as-built drawings that incorporates all revisions that have been made to them.

decommissioned, in relation to a storage system, means that the system has permanently ceased to be used.

Note. Other legislation may require the cessation of the use of certain storage systems, for example a system to which clause 174ZF of the *Occupational Health and Safety Regulation 2001* applies.

environment management plan means an environment management plan referred to in clause 10.

Equipment Level 1 means the equipment required to meet the requirements for Equipment Level 1 set out in Table 3.3 of the Code.

installation of a storage system or any part of a storage system means the original installation of the system on the premises on which it is situated, and includes any work in the vicinity of the premises necessary for the installation, and any alteration made before the system is first used.

Public consultation draft

Clause 3 Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Part 1 Preliminary

modification of a storage system or any part of a storage system includes the upgrade, repair, replacement, extension, removal or other alteration of the system, but does not include any alteration made before the system is first used.

new system means any storage system that is not an old system.

old system means any storage system:

- (a) that was in use before [commencement date], or
- (b) whose installation had been lawfully commenced before [commencement date], or
- (c) for whose installation development consent had been obtained under the *Environmental Planning and Assessment Act 1979* before [commencement date],

but does not include a storage system that replaces any such system.

person responsible for a storage system means the occupier of the premises on which the system is, or is being, installed, but does not include the occupier of premises on which a decommissioned system is situated.

storage system means an underground petroleum storage system within the meaning of the Code, and includes any structure through which product or used oil routinely passes from one part of a storage system to another part of the system.

the Act means the *Protection of the Environment Operations Act 1997*.

the Code means CP4—2002 *Code of Practice for the Design, Installation and Operation of Underground Petroleum Storage Systems (UPSS)*, published by the Australian Institute of Petroleum Ltd, as in force on [commencement date] and as modified by Schedule 1.

Note. Copies of the Code are available for inspection at Department of Environment and Conservation offices in Sydney (Goulburn Street), Parramatta, Wollongong, Newcastle, Armidale, Newcastle, Bathurst and Queanbeyan. Copies of the Code may also be obtained, for a fee, from the Australian Institute of Petroleum Ltd, Level 2, 24 Marcus Clarke Street, Canberra City ACT, telephone 6247-3044, email: aip@aip.com.au.

use a storage system includes:

- (a) allow product or used oil to remain in the system, and
- (b) cause or permit the use of the system.

validation report, in relation to a storage system or a tank that forms part of a system, means a Validation Report within the meaning of *Contaminated Sites: Guidelines for Assessing Service Station Sites*, December 1994, published by the EPA.

- (2) For the purposes of this Regulation, the words and expressions set out in the Table to this subclause have the meanings they have in the Code.

Public consultation draft

Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Clause 4

Preliminary

Part 1

Table

as-built drawings	pit
bunded tank situated below ground level	product
catchment basin	separator
discrepancy or loss investigation	septic tank
equipment integrity test	spill
groundwater monitoring well	stormwater or wastewater collection system
inventory control reconciliation	
leak	sump
liquefied petroleum gas storage system	tank
pipework not associated with a storage system	used oil

(3) Notes included in this Regulation do not form part of this Regulation.

4 References to documents referred to in the Code

For the purposes of this Regulation, a reference in the Code to a publication referred to in the Table to this clause is taken to be a reference to that publication as in force for the time being.

Table

<i>API 1631 Recommended Practice for the Interior Lining of Existing Steel Underground Tanks</i> , published by the American Petroleum Institute
<i>AS/NZS 1020:1995, The control of undesirable static electricity</i>
<i>AS1692–1989, Tanks for flammable and combustible liquids</i>
<i>AS 1940–2004, The storage and handling of flammable and combustible liquids</i>
<i>AS 2832.1–2004, Cathodic protection of metals, Part 1: Pipes and cables</i>
<i>AS 2832.2–2004, Cathodic protection of metals, Part 2: Compact buried structures</i>
<i>AS/NZS 3000–2000, Electrical Installations (known as the Australian/New Zealand Wiring Rules)</i>
<i>CP5—2003 Code of Practice for Pipeline, Road Tanker Compartment and Underground Tank Identification</i> , published by the Australian Institute of Petroleum Ltd
<i>CP22—2003 Code of Practice for Removal and Disposal of Underground Petroleum Storage Tanks</i> , published by the Australian Institute of Petroleum Ltd

Public consultation draft

Clause 5 Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Part 1 Preliminary

EPA/530/UST-90/007 *Standard Test Methods for Evaluation of Leak Detection Methods: Statistical Inventory Reconciliation Methods*, published by the Environmental Protection Agency of the United States of America

Leaded Gasoline Tank Cleaning and Disposal of Sludge, published by Associated Octel

RP 001 *Recommended Practices for Installation of Underground Liquid Storage Systems*, published by the Petroleum Industry Contractors Association

UL971 *Non-corrodible flexible piping*, published by Underwriters Laboratories Inc.

5 Regulation does not apply to certain works

This Regulation does not apply to the following:

- (a) a sump, separator, stormwater or wastewater collection system, catchment basin, pit, septic tank or other like structure (unless product or used oil routinely passes from one part of a storage system to another part of the system through the structure),
- (b) a banded tank situated below ground level (such as in a basement, cellar or tunnel) but not in the ground (unless product or used oil routinely passes from one part of a storage system to another part of the system through the tank),
- (c) pipework not associated with a storage system,
- (d) a liquefied petroleum gas storage system,
- (e) a storage system that is a scheduled activity.

Note. Systems that store more than 2,000 tonnes of petroleum products or more than 20 tonnes of petroleum waste are scheduled activities.

Public consultation draft

Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Clause 6

Use, modification and decommissioning of storage systems

Part 2

Part 2 Use, modification and decommissioning of storage systems

Division 1 Use of storage systems

6 System not to be used if not designed and installed in accordance with the Code

- (1) The person responsible for a storage system must not use the system unless it has been designed and installed in accordance with the Code.
Maximum penalty: 200 penalty units in the case of an individual and 400 penalty units in the case of a corporation.
- (2) This clause does not apply to an old system.

7 System not to be used without Equipment Level 1

- (1) The person responsible for a storage system must not use the system unless:
 - (a) in the case of a new system, the system has Equipment Level 1, and
 - (b) in the case of an old system, the system has so much of Equipment Level 1 necessary for compliance with Section 4.5.1 of the Code.Maximum penalty: 200 penalty units in the case of an individual and 400 penalty units in the case of a corporation.
- (2) Subclause (1) (b) does not apply to an old system until [commencement date + 1 year].

8 System not to be used except in accordance with the Code

- (1) The person responsible for a storage system must not use the system otherwise than in accordance with the Code.
Maximum penalty: 200 penalty units in the case of an individual and 400 penalty units in the case of a corporation.
- (2) However, until [commencement date + 1 year], the only provisions of the Code that apply to the use of an old system are Sections 7.5 and 7.6.
- (3) This clause does not apply to an old system to the extent that using the system in accordance with the Code, or any part of the Code, requires the old system to be modified to include equipment.

9 System not to be used without groundwater monitoring wells

- (1) The person responsible for a storage system must not use the system unless the system has groundwater monitoring wells installed and used

Public consultation draft

Clause 10 Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Part 2 Use, modification and decommissioning of storage systems

in accordance with subparagraphs (a)–(f) of the third paragraph of Section 4.5.7 of the Code.

Maximum penalty: 200 penalty units in the case of an individual and 400 penalty units in the case of a corporation.

- (2) This clause does not apply to an old system until [commencement date + 2 years].

Note. Exemptions from compliance with this clause may be applied for under clause 25.

10 System not to be used without environment management plan

- (1) The person responsible for a storage system must not use the system unless:

- (a) the person responsible has adopted an environment management plan for the system containing the matters set out in Schedule 2, and
- (b) the system is used in accordance with the environment management plan for the system.

Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.

- (2) This clause does not apply to an old system until [commencement date + 6 months].

11 System not to be used unless measuring instruments checked and data recorded

- (1) The person responsible for a storage system must not use the system unless:

- (a) all gauges, indicators, monitoring wells and other measuring instruments in the system have been checked in accordance with Appendix H of the Code, and
- (b) all data produced by a gauge, indicator, monitoring well or other measuring instrument referred to in paragraph (a) has been recorded.

Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.

- (2) Subclause (1) (b) does not apply to a gauge, indicator, monitoring well or other measuring instrument that automatically records the data it produces.

Public consultation draft

Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Clause 12

Use, modification and decommissioning of storage systems

Part 2

Division 2 Modification of storage systems

12 System not to be modified except in accordance with the Code

The person responsible for a storage system must ensure that the system is not modified otherwise than in accordance with the Code.

Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.

13 Validation report to be prepared after tank removed

(1) If a tank that is part of a storage system is removed, the person responsible for the system must ensure that a validation report:

- (a) is prepared in respect of the land from which the tank was removed, and
- (b) is served on the relevant local authority no later than 90 days after the day the tank was removed (or such longer period as the appropriate regulatory authority may allow).

Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.

(2) A person responsible for a storage system must ensure that any replacement tank for the system is not installed earlier than 7 days after the day the local authority is served with the copy of the validation report under subclause (1).

Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.

14 Equipment integrity test to be performed

(1) On the completion of any modification of a storage system that includes the removal or replacement of a tank, the person responsible for the system must ensure that an equipment integrity test of the system is performed in accordance with Section 6.4.5 and Section 8.5 of the Code.

Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.

(2) This clause does not apply to the removal of a tank in the course of the removal of an entire storage system after it has been decommissioned.

15 Record to be made of significant modifications

(1) The person responsible for a storage system must ensure that a record setting out the following information is to be made of any significant modification to the system:

- (a) a comprehensive description of the modification,

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Clause 16 Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Part 2 Use, modification and decommissioning of storage systems

(b) the date of commencement of the modification and the date of completion of the modification,

(c) the results of any equipment integrity test required under clause 14.

Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.

(2) The person responsible for a storage system must ensure that the as-built drawings of the system required under clause 20 are revised to reflect any significant modification to the system.

Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.

(3) For the purposes of this clause, a *significant modification* to a storage system is a modification that, if not reflected in a revised version of the as-built drawings of the system (as referred to in Section 6.4.4 of the Code), would result in the current as-built drawings being inaccurate or misleading.

(4) This clause does not apply to the removal of an entire storage system after it has been decommissioned.

16 Exemption for certain modifications

This Division does not apply to modifications that were commenced before [commencement date].

Division 3 Decommissioning of systems

17 Validation report to be prepared after system decommissioned

The person responsible for a storage system immediately before the system was decommissioned must ensure that:

(a) a validation report is prepared, in respect of the land on which the system was, or is, situated, and

(b) served on the local authority no later than 90 days after the system was decommissioned (or such longer period as the appropriate regulatory authority may allow).

Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.

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Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Clause 18

Record-keeping

Part 3

Part 3 Record-keeping

18 Record to be made of any discrepancy or loss investigation

The person responsible for a storage system must ensure that a record is made of the result of any discrepancy or loss investigation that is conducted, pursuant to Section 7.5 of the Code, in respect of a storage system.

Maximum penalty: 200 penalty units in the case of an individual and 400 penalty units in the case of a corporation.

19 Incident log to be kept on premises

- (1) The person responsible for a storage system must ensure that an incident log for the system is kept, in accordance with this clause, on the premises on which the system is situated.

Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.

- (2) The following activities and incidents are to be recorded in the incident log of a storage system:
- (a) the carrying out of any activity, by a person acting otherwise than under the control or management of the person responsible for the system, that affected, is affecting or could affect the integrity of the system, and
 - (b) the occurrence of any unplanned or abnormal incident (including operational disruptions or equipment failures) that affected, is affecting or could affect the long-term safety of the system.

20 As-built drawings to be kept on premises

The person responsible for a storage system must ensure that the current as-built drawings of the system, as referred to in Section 6.4.4 of the Code, are kept on the premises on which the system is situated.

Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.

21 Notifications under Part 5.7 of the Act

A notification under Part 5.7 of the Act of a pollution incident involving a storage system is to be made in a form approved by the EPA.

22 Environment management plans to be retained while current

- (1) Subject to subclause (2), the person responsible for a storage system must ensure that the environment management plan adopted for the system, including any such plan delivered to the person in accordance with subclause (2), is retained until the earlier of the following:

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Clause 23 Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Part 3 Record-keeping

(a) the day on which the plan is replaced by another environment management plan, or

(b) the day on which the system is decommissioned.

Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.

(2) If someone else becomes the person responsible, the previous person responsible must ensure that the environment management plan is delivered to the new person responsible.

Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.

23 Certain records to be retained for 7 years from date of creation

(1) For the purposes of this clause, *required document* means any of the following:

(a) a document containing the data produced by a gauge, indicator, monitoring well or other measuring instrument referred to in clause 11,

(b) a record referred to in clause 18,

(c) a notification referred to in clause 21.

(2) Subject to subclause (3), the person responsible for a storage system must ensure that each required document for the system, including any document delivered to the person in accordance with subclause (3), is retained for at least 7 years from the day on which it was created.

Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.

(3) If someone else becomes the person responsible, the previous person responsible must ensure that all required documents for the system that are in his or her possession are delivered to the new person responsible.

Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.

(4) If the storage system is decommissioned, the person responsible for the system immediately before the system was decommissioned remains the person responsible for the purposes of subclause (2).

24 Other records to be retained for 7 years from date of decommissioning

(1) For the purposes of this clause, *required document* means any of the following:

(a) any validation report referred to in clause 13,

(b) any record referred to in clause 15.

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Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Clause 24

Record-keeping

Part 3

- (c) any validation report referred to in clause 17,
 - (d) the incident log referred to in clause 19,
 - (e) the as-built drawings referred to in clause 20,
- (2) Subject to subclause (3), the person responsible for a storage system must ensure that each required document for the system, including any document delivered to the person in accordance with subclause (3), is retained for at least 7 years from the day on which the system is decommissioned.
Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.
- (3) If someone else becomes the person responsible, the previous person responsible must ensure that all required documents for the system that are in his or her possession are delivered to the new person responsible.
Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.
- (4) If the storage system is decommissioned, the person responsible for the system immediately before the system was decommissioned remains the person responsible for the purposes of subclause (2).

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Clause 25 Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Part 4 Miscellaneous

Part 4 Miscellaneous

25 Exemptions

- (1) The EPA may, by order in writing, exempt a person or a class of persons specified in the order from any provision of this Regulation specified in the order to the extent that the provision applies to the person or class in respect of any storage system specified in the order.
- (2) The EPA may grant an exemption on application or of its own motion.
- (3) An application for an exemption must be accompanied by such fee (if any) as the EPA may determine.
- (4) An order under this clause:
 - (a) has effect in such circumstances (if any), and subject to such conditions (if any), as are specified in the order, and
 - (b) must specify a person to be served with the order and must be served on that person, and
 - (c) has effect on and from service of the order or such later date as may be specified in the order, and
 - (d) is subject to the condition that the exempted person complies with all of the provisions of the Act and the other provisions of this Regulation that apply to the person, and
 - (e) may be revoked by the EPA at any time by order in writing published in the Gazette or served on the person referred to in paragraph (b).
- (5) A person who contravenes a condition of an order under this clause applying to the person is guilty of an offence.
Maximum penalty: 100 penalty units in the case of an individual and 200 penalty units in the case of a corporation.

26 Offence of providing false or misleading information

A person must not, in or in connection with any certificate, application, claim, environment management plan, document or requirement under this Regulation, provide any information, or make any statement or record, that is false or misleading in a material particular knowing it to be false or misleading.

Maximum penalty: 200 penalty units in the case of an individual and 400 penalty units in the case of a corporation.

27 Validation report to be prepared as if land were site to be remediated

A validation report required under this Regulation in respect of land must comply with *Contaminated Sites: Guidelines for Assessing*

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Clause 28

Miscellaneous

Part 4

Service Station Sites, December 1994, published by the EPA and for that purpose, those guidelines apply to the land as if the land is a site required to be remediated under those guidelines.

28 Amendment of other Regulations

The Regulations specified in Schedule 3 are amended as set out in that Schedule.

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Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Schedule 1 Modifications of the Code

Schedule 1 Modifications of the Code

(Clause 3 (1))

1 References to authority

A reference in the Code to the Authority is, in relation to premises on which a storage system is or is being installed, a reference to the appropriate regulatory authority for the premises.

2 References to retention of records

A requirement of the Code that a record be retained for the life of:

- (a) the storage system the record relates to, or
- (b) the part, of a storage system, the record relates to,

is taken to be a requirement that the record be retained for at least 7 years after the system was decommissioned.

3 Reference to the owner or operator

A reference in the Code to an owner or operator of a storage system is a reference to the person responsible for the system.

4 Omissions

Sections 1.3, 1.4 and 4.3.6 of the Code are taken to be omitted.

5 Discrepancy in inventory control records

Section 7.5 (b) of the Code does not apply to a discrepancy indicated by an inventory control reconciliation that is not higher than normal (within the meaning of Section 7.5 of the Code).

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Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Environment management plan

Schedule 2

Schedule 2 Environment management plan

(Clause 10)

Contents of environment management plan

An environment management plan for a storage system is to contain the following:

- (a) the name of the person responsible for the system and an address for service for the person responsible,
- (b) if the person responsible is not a natural person—the name of a natural person or natural persons authorised, on behalf of the person responsible, to do any thing the person responsible is legally capable of doing in respect of the control and management of the system,
- (c) the street address of the premises on which the system is situated,
- (d) the land title particulars (such as the Lot and DP numbers) of the land on which the system is situated,
- (e) if the person responsible for the system is not the person in possession of the land on which the system is situated—the name of the person in possession,
- (f) details of access to, and the security of, the system, including details of locks, gates, fences and vegetation,
- (g) the as-built drawings of the system,
- (h) a copy of all manufacturer's specifications (if provided by, or available from, the relevant manufacturer),
- (i) a maintenance schedule for the system that states when maintenance is proposed to be carried out on the system,
- (j) the location of all records retained in accordance with Part 3,
- (k) a plan that provides for measures to be taken to comply with Section 7.6 of the Code in the event of a leak or spill,
- (l) a summary of any measures taken to ensure community awareness of the system and any safety issues relating to the use of the system,
- (m) a plan for the auditing of compliance with, and the effectiveness of, the environment management plan.

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Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Schedule 3 Amendment of other Regulations

Schedule 3 Amendment of other Regulations

(Clause 28)

3.1 Amendment of Protection of the Environment Operations (General) Regulation 1998

[1] Clause 67A

Insert after clause 67:

67A Underground petroleum storage systems

The EPA is declared, under section 6 (3) of the Act, to be the appropriate regulatory authority for any matter arising under the *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005*.

[2] Clause 67A

Omit clause 67A.

3.2 Amendment of Protection of the Environment Operations (Penalty Notices) Regulation 2004

[1] Schedule 1 Penalty notice offences

Insert after the matter relating to the *Protection of the Environment Operations (Noise Control) Regulation 2000*:

Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Column 1	Column 2	Column 3	Column 4
Provision of Regulation	Officer	Penalty (individuals)	Penalty (corporations)
Clause 6 (1)	2	\$500	\$1000
Clause 7 (1)	2	\$500	\$1000
Clause 8 (1)	2	\$500	\$1000
Clause 9 (1)	2	\$500	\$1000
Clause 10 (1)	2	\$250	\$500
Clause 11 (1)	2	\$250	\$500
Clause 12	2	\$250	\$500
Clause 13 (1)	1, 2	\$250	\$500

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Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005

Amendment of other Regulations

Schedule 3

Column 1	Column 2	Column 3	Column 4
Provision of Regulation	Officer	Penalty (individuals)	Penalty (corporations)
Clause 13 (2)	1, 2	\$250	\$500
Clause 14 (1)	2	\$250	\$500
Clause 15 (1)	2	\$250	\$500
Clause 15 (2)	2	\$250	\$500
Clause 17	1, 2	\$250	\$500
Clause 18	2	\$500	\$1000
Clause 19 (1)	2	\$250	\$500
Clause 20	2	\$250	\$500
Clause 22 (1)	2	\$250	\$500
Clause 22 (2)	2	\$250	\$500
Clause 23 (2)	2	\$250	\$500
Clause 23 (3)	2	\$250	\$500
Clause 24 (2)	2	\$250	\$500
Clause 24 (3)	2	\$250	\$500
Clause 25 (5)	2	\$250	\$500
Clause 26	2	\$500	\$1000

[2] Schedule 1

Insert “1,” before “2” wherever occurring in Column 2 of the matter relating to clauses 6 (1), 7 (1), 8 (1), 9 (1), 10 (1), 11 (1), 12, 14 (1), 15 (1) and (2), 18, 19 (1), 20, 22 (1), 22 (2), 23 (2) and (3), 24 (2) and (3), 25 (5) and 26 of the *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2005*.