MINOR DISSERTATION, LLM IN MARINE AND ENVIRONMENTAL LAW

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A critical and comparative analysis of the under regulation of underground storage tanks in South Africa and the attendant consequences for environmental resources.

ABSTRACT

In South Africa, as with the rest of the world, pollution presents a major threat to the environment and thus to the intimately linked social and economic facets of society. The very notion of sustainability is premised on the inextricability of socio-economic demands and the capacity of the environment to support and sustain such demands. It is trite that without a healthy environment there is no future but if there is a future, then access to ecosystem services in it will become an increasingly critical factor for economic resilience and success. Prevention of pollution is thus of critical importance. The focus of this thesis is on one form of pollution in particular, namely, pollution resulting from petrochemicals leaking from underground storage tanks ("USTs") situated at fuel retailer outlets and truck stops. These hazardous substances can contaminate nearby groundwater and soil causing a multitude of problems including the contamination and degradation of water and soil in the surrounding areas. Although these tanks constitute potentially devastating environmental hazards, the problem is easily addressed through proper regulation and governance and the adoption of practical guidelines informed by countries with the relevant knowledge and expertise. The South African government has the power to mitigate against and prevent this kind of harm through coordinated policies, integrated management and sound financial planning. In the concluding chapter on this study, recommendations for the drafting and implementation of such measures will be provided.

Contents

Abbreviations

BTEX	Benzene, Toluene, Ethlybenzene, Xylene
ECA	Environment Conservation Act
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
DEA	Department of Environmental Affairs
DWA	Department of Water Affairs
ISO	International Organisation for Standardisation
LUST	Leaking Underground Storage Tank
MHI	Major Hazard Installation
NEMA	National Environmental Management Act
NWA	National Water Act
OHS	Occupational Health and Safety
OUST	Office of Underground Storage Tanks
PIEEC	Petroleum Industry Engineering and Environmental Committee
S&EIR	Scoping and Environmental Impact Reporting
SABS	South African Bureau of Standards
SANS	South African National Standards
SAPIA	South African Petroleum Industry Association
SARA	Superfund Amendments and Reauthorization Act
US	United States (of America)
UST	Underground Storage Tank(s)

CHAPTER 1

1. INTRODUCTION

1.1 The Importance of South Africa's Groundwater

"Environmental pollution is an incurable disease. It can only be prevented."[1]

As a semi-arid country, South Africa's water resources are invaluable to its populace. Large portions of the population are dependent on underground aquifers for their daily water supply, which, if rendered unusable, will result in dire circumstances.[2] Additionally, as increasing pressure is being placed on natural resources, it is incumbent upon the legislature to revisit the notions of sustainable use and development as it pertains to Underground Storage Tanks ("USTs") and the prevention of pollution. South Africa is on the verge of what has been termed "water stress" due to a growing population and concomitant demand for water supply coupled with the country's socio-economic conditions.[3]

"Groundwater, despite its relatively small contribution to the total water supply in South Africa (approximately 13%), represents an important strategic water resource. Owing to the lack of perennial streams in the semi-desert to desert parts, two-thirds of South Africa's surface area is largely dependent on groundwater. In these water-scares areas, groundwater is more valuable than gold. Although irrigation is the largest user of groundwater, groundwater provides the water supply to more than 300 towns and smaller settlements."[4]

Dr Shafick Adams, Research Manager at the Water Research Commission, said at a media briefing in 2011 that "…the total estimated volume of available, renewable groundwater in South Africa is 10 343 million m3/a, or 7 500 million m3/a under drought conditions. South Africa is currently using between 2 000 and 4 000 million m3/a of this groundwater. Therefore, there is the potential to considerably increase groundwater use in South Africa."[5] He added that the use of groundwater could be instrumental in alleviating the water crisis in South Africa.

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[1] Barry Commoner in an interview with Thomas Vingciguerra of the NewYork Times, published 19 June 2007.

[2] The "Bottles for Beaufort" campaign demonstrated the devastating effects of a drought in the area, during which time many of Beaufort West's residents were completely reliant on borehole water for their daily water supply – everyone else being dependent on the goodwill of those bringing bottles of water in from surrounding areas and distributing them amongst the town's residents on a daily basis. See http://www.oasiswater.co.za/blog/bottles-beaufort-ro3-oasis-project, accessed on 13 June 2013.

[3] Glazewski, J *Environmental Law in South Africa* (2013) at 16-3.

[4] Groundwater Division of the Geological Society of South Africa http://gwd.org.za, accessed 13 June 2013.

[5] Press release by Dr Adams on 22 March 2011, published on the South African Water Research Commission's website, available at http://www.wrc.org.za/News/Pages/GroundwaterusepotentialforSouthAfrica.aspx, accessed 13 June 2013.

A further benefit of the existence of groundwater systems is that groundwater-reliant ecosystems have a natural and intrinsic resilience to climate change.[6]

It is clear from the above that groundwater currently plays, and will increasingly play, a crucial role in ensuring that all South Africans have access to clean, viable drinking water on a daily basis and that it is of paramount importance that such a precious resource be protected at any cost.

1.2 The nature of the problem

In South Africa, USTs are used for various purposes including the storage of numerous substances and chemicals as part of various industry practices. Unfortunately, it is not within the ambit of this paper to discuss each substance stored in USTs or every use to which USTs are or may be put. Instead, the focus of this paper will be very specifically on the storage of petrochemicals such as petroleum and diesel at fuel retailer outlets and truck stops situated in residential areas. The particular nature and chemical composition of petrochemicals as well as the peculiarities of the petroleum industry itself is such that a separate and focused discussion such as this one (and ultimately, the recommendation that separate and focused regulations be implemented governing them) is warranted.

As such, what follows is a discussion of the USTs used for the specific purposes as set out above. When they first came into use, the vast majority of these USTs were constructed of welded steel, coated with epoxy coal tar.[7] The problem with that is that rust and corrosion inevitably deteriorate aging steel tanks creating "a prescription for leaks"[8] over time, with the average life-span of unprotected steel tanks being only approximately 10 years (or even less if exposed to water.)[9]

The safe storage and handling of petroleum products at services stations is a particularly onerous task given the nature of the chemicals involved and the devastation that may result from a spill or leak. According to the South African Petroleum Industry Association (“SAPIA”), the leading cause of leakages at service stations is corroded storage tanks and pipework.[10] This poses an enormous environmental risk since, as mentioned above, USTs leaking

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[6] Maherry A., *Planning for groundwater in South Africa* (2010) CSIR Research Space.
[7] South African Petroleum Industry Association *Oil Industry Approach to Leak Prevention and Impact Minimisation at Service Stations* (2013) SAPIA.
[8] Basile J., *Still No Remedy After All These Years: Plugging the Hole in the Law of Leaking Underground Storage Tanks* (1998) Indiana Law Journal: Vol. 73: Iss. 2, Article 16.
[9] Indiana Government *About Leaking Underground Storage Tanks* available online at http://www.in.gov/idem/5067.htm, accessed 13 June 2013.
[10] Supra note 7.

hazardous substances can contaminate nearby groundwater and soil and greatly affect the quality thereof. One litre of fuel can contaminate approximately 1 000 000 litres of groundwater[11] and one pin-prick sized hole in a UST can leak up to 1 500 litres of fuel a year.[12] Thus, as a result primarily of corrosion, leaking USTs in South Africa, as in the United States[13], have caused serious and sometimes irreversible contamination of soil and groundwater resources. As mentioned above, this is of particular concern in a country where the imperative to provide potable water will become increasingly linked to and reliant upon good quality groundwater supplies in the future.

The problem of leaking USTs is one that has drawn substantial attention in South Africa in recent years, featuring in print and broadcast media at a national level[14]. In October 2011, local television series, Carte Blanche, ran a story on the contamination of Beaufort West's many public and private boreholes by hydrocarbons leaking from local fuel retailers' USTs.[15] The South African Broadcasting Commission ("SABC") reported on 28 September 2011, that "…the South African Petroleum Industry Association says it's doing all it can to stop the pollution of groundwater in Beaufort West in the Central Karoo. Fuel leakages at three petrol stations have contaminated about 100 boreholes in the area."[16] Incidents of this nature have also been reported in Rustenburg in the North West, making it a nation-wide problem.

In addition to rendering water unsuitable for domestic purposes due to issues such as foul odour and taste, contamination by petroleum products introduces the dreaded "BTEX" chemicals into the environment and specifically into soil and water used by surrounding residents. BTEX is the abbreviation used for four compounds found in petroleum products i.e.

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[11] Environment Canada website http://www.ec.gc.ca/eau-water/default.asp?lang=En&n=6A7FB7B2-1 accessed 12 June 2013.
[12] *Leaking Underground Storage Tanks: A Threat to Public Health & Environment* (2005) Sierra Club.
[13] The US Environmental Protection Agency ("the EPA") estimated that in the 1980s, hundreds of thousands of the several million USTs in the United States containing hazardous substances such as petrochemicals were leaking and caused immeasurable environmental damage (Tiemann, M *Leaking Underground Storage Tank Cleanup Issues* (1999) CRS Report for Congress, available online at http://cnie.org/NLE/CRSreports/waste/waste-18.cfm, accessed 14 October 2013).
[14] For examples see Cape Times articles *Knysna service station shut down over fuel leak* published in Legalbrief Environmental (6 September 2011) and available via http://www.legalbrief.co.za/article.php?story=20110906094221379 and the recently featured Carte Blanche story on Beaufort West's polluted groundwater, available at http://beta.mnet.co.za/mnetvideo/BrowseVideo.aspx?ChannelId=1&vid=39124.
[15] The programme aired on 2 October 2011 and can be viewed at http://beta.mnet.co.za/carteblanche/Article.aspx?Id=4435&Showid=1, accessed 12 June 2013;
[16] Full article available online at http://www.sabc.co.za/news/a/7a1ed480487eefdca2affb25440afa7a/Petroleum-Association-trying-its-best-to-stop-water-pollution--20110928, accessed 12 June 2013. See also LegalBrief article dated 6 September 2011 which reported that "Leaking fuel tanks at Knysna's Total garage have contaminated the surrounding area with petrol and the service station has been closed for five months" - full article available online at http://www.legalbrief.co.za/article.php?story=20110906094221379 accessed 12 June 2013.

benzene, toluene, ethylbenzene, and xylene. The effect of human health of these compounds is profound and wide-ranging. Short-term exposure to BTEX compounds has been associated with skin and sensory irritation, central nervous system problems such as tiredness, dizziness, headache and loss of coordination, and effects on the respiratory system, such as eye and nose irritation.[17] Prolonged or chronic exposure can affect the kidney, liver and blood systems, while long-term high-level exposure to benzene can lead to leukemia and cancers of the blood-forming organs.[18]

Furthermore, once released into the environment, BTEX chemicals can volatilize (evaporate), dissolve in water, attach to soil particles or, if there is sufficient oxygen present, degrade biologically (albeit very slowly).[19] They are, as such, highly itinerant contaminants that can travel easily and in various phases. In the US, it has been reported that "[t]he main source of BTEX contamination is the leakage of gasoline from faulty and poorly maintained underground storage tanks."[20] It is suggested that, based upon the findings in this paper, upon the conduct of research in South Africa a similar situation will be unearthed.

While remediation is certainly possible in cases such as the ones discussed in this paper (although possibly never a complete return to the *status quo ante*), pollution of underground aquifers, in particular, is especially difficult to deal with due to the complex geological structures and fractured rock networks within which the aquifers often occur. In addition, the chemical nature of the compounds released into the earth and water in these cases is such that they deteriorate incredibly slowly and take decades to fully degrade.

As such, the contamination of groundwater by any means, but especially by means of such a particularly hazardous, mobile and persistent contaminant, is completely intolerable. In this regard, prevention is always better than cure and particularly so in the case of environmental harm, where the damage often only becomes apparent years after it is caused, increasing the complexity of showing causation (amongst other issues).

The importance of prevention is echoed in the notion of sustainable development which underlies the national environmental management principles contained in the National Environmental Management Act ("NEMA") and in the preventive and precautionary principles in particular. Remediation of the environment can take years to achieve and, in most cases,

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[17] The Ohio Department of Health and the Agency for Toxic Substances and Disease Registry (ATSDR) *BTEX (benzene, toluene, ethylbenzene, and xylene)* pamphlet (2012), available online at http://www.odh.ohio.gov/~/media/ODH/ASSETS/Files/eh/HAS/btex.ashx, accessed 25 March 2014.
[18] Ibid.
[19] Ibid.
[20] Ibid.

total rehabilitation is unlikely due to the fragile and easily disturbed nature of ecosystems and the fauna and flora that comprise them. However, in the case of leaks from USTs, prevention is absolutely achievable through the implementation of tried-and-tested safety precautions, careful monitoring and contingency plans already well-established in other jurisdictions around the world.[21]

Combatting corrosion is by no means an insurmountable task and in a bid to proactively deal with the problem, SAPIA and the Oil Industry Environment Committee ("OIEC")[22], have implemented numerous measures to prevent leakage and minimise environmental impact at service stations throughout the country. In addition, various national standards have been published by the South African Bureau of Standards ("the SABS") in an attempt to ensure that corrosion of tanks and pipes is reduced, if not altogether eradicated.

However, despite this and other initiatives taken by industry, as well as the Environmental Impact Assessment ("EIA") regulations published in terms of the National Environmental Management Act[23] ("NEMA"), dealt with more fully in paragraph 3.3.3.1 below, and the Land Contamination provisions of the National Environmental Management: Waste Act[24] ("the Waste Act"), dealt with more fully below in paragraph 3.3.3, it is submitted that such regulation is not nearly robust enough, especially when compared to the US system, and that the installation, use and decommissioning of USTs remains largely under-regulated and poses a constant threat to the sanctity of our water resources.

This is particularly true of tanks installed prior to any of the abovementioned safety measures or regulations having come into existence or effect. These older tanks are especially susceptible to corrosion and yet, due to a lack of any legislated standards determining that they should be removed from the ground and either replaced or upgraded, or even establishing a time period after which they should be forcibly decommissioned, these mostly single-walled tanks with their outdated design and technology are still in commission around the country (some up to thirty years after first being installed). This leaves unspoiled underground water resources within proximity of these tanks under constant threat. What is needed is thus a dedicated set of UST regulations to properly control every aspect and phase of a USTs life-cycle and adequately deal with emergency situations which arise in this context, especially so

[21] The United States and Scotland, for example, have rigorous and comprehensive industry-specific regulatory regimes governing the installation, monitoring and decommissioning of USTs and ancillary pipework.
[22] "OIEC" comprises BP, Caltex, Engen, Exel, Petronet, Sasol, Shell, Tepco and Total.
[23] Act 107 of 1998.
[24] Act 59 of 2008.

because the contaminants involved are of a distinctive nature and so regulation thereof should be dealt with separately and in specific detail, as opposed to the current attempts to regulate them along with other contaminants of a vastly different nature.

1.3 Structure of this thesis

This study is divided into 5 chapters. Chapter two examines the US approach to regulating USTs by considering firstly the history and development of their system, and then current legislation, policy documents and implementation procedures including both incentives and control measures. Their liability regime is also considered, with a specific focus on measures taken to ensure that the environment is always of uppermost concern and remains protected. It will be shown that success in managing and preventing leakages and other environmental problems is achieved through strict regulation and enforcement mechanisms.

Chapter 3 focuses on the South African law that is currently applicable to the regulation of USTs including both the common law and statutes, international principles to which South Africa is bound as well as certain additional measures that have been taken by Government and Industry alike to prevent and detect pollution of this nature. The efficacy of these measures will be discussed in the comparison to the US system and certain lacunae will be identified which will form the basis for the recommendations contained in the concluding chapter.

Chapter four looks at the prevailing liability regime in South Africa in relation to the principles of sustainable development and the polluter pays, in terms of which those responsible for environmental degradation should bear the costs of rehabilitation. This is relevant since there is currently no specific liability regime governing this area of law, nor is there a public trust fund to which recourse may be sought for pollution of this nature in the event that those responsible cannot be found or are unable to pay the costs of rehabilitation.

Chapter five concludes by making recommendations for South Africa to draw on the US example and draft entirely new industry-specific regulations to be implemented by the Department of Environmental Affairs in terms of the Waste Act in collaboration with other governmental role-players and industry leaders. It compares the South African situation with that of the US and identifies key areas in which South Africa could seek to make improvements.

CHAPTER 2

2. THE UNITED STATES' REGULATORY REGIME

2.1 History of the US System

Until the mid-1980s, most USTs in the USA, like South Africa, were single-walled and made of bare steel and, as was the case in South Africa, were susceptible to rust and corrosion after approximately ten years (or even less under certain conditions, for example, exposure to groundwater).[25] The US Environmental Protection Agency ("the EPA") estimated that in the 1980s, hundreds of thousands of the several million USTs in the United States containing hazardous substances such as petrochemicals were leaking[26], and allowing their contents to seep into and contaminate the surrounding soil and groundwater. This posed a huge threat to US citizens, almost half of whom are entirely dependent on groundwater for their daily needs.[27] Faulty installation and inadequate operating and maintenance procedures were also instrumental in causing tanks to leak and the nation-wide problem, which was reported as the leading source of groundwater contamination by various States[28], prompted Congress to pass legislation in 1984 requiring the EPA to develop a comprehensive regulatory regime to govern the storage of petroleum and certain other hazardous substances in USTs.[29]

As part of the regime, the EPA was directed to establish a Leak Prevention, Detection and Correction Action Program[30], through the publication of regulations that would require owners and operators of new and existing tanks to detect and prevent leaks and to rehabilitate sites where releases had already occurred.[31] The first set of federal regulations was published in 1988[32] and the latest, requiring that all tanks installed prior to December 1988 be upgraded, replaced, or closed, entered into effect on 22 December 1998.[33] The regulations established

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[25] Supra note 9.
[26] Tiemann M., *Leaking Underground Storage Tank Cleanup Issues* (1999) CRS Report for Congress, available online at http://cnie.org/NLE/CRSreports/waste/waste-18.cfm, accessed 14 June 2013.
[27] The US Environmental Protection Agency website, Overview of the EPA, available at http://www.epa.gov/oust/overview.htm accessed on 13 June 2013.
[28] Supra note 26.
[29] Supra note 27
[30] US House of Representatives Committee Meetings, Housing and Community Opportunity Subcommittee, *The Erosion of Communities by Leaking Underground Storage Tanks* (2002), available online at http://commdocs.house.gov/committees/bank/hba83204.000/hba83204_0f.htm, accessed 14 June 2013.
[31] Supra note 26.
[32] The empowering legislation is the Resource Conservation and Recovery Act (RCRA) of 1976, which was amended by Congress in 1984 to provide for the leak prevention and detention program referred to in the text.
[33] Supra note 26.

technical standards and operating requirements for tank design, installation, spill and overfill control, corrective action, and tank closure[34] and secondary containment requirements were introduced for all new tanks to ensure that any fluids leaking from the primary containment were restricted.[35]

Beginning in 1985, Congress placed a ban on the installation of any bare steel tanks and piping and in the same year, the Office of Underground Storage Tanks ("OUST") was created as part of EPA's Office of Solid Waste and Emergency Response ("OSWER") to implement the new regulatory regime for USTs.[36] Two separate divisions, one charged with the development of policy and standards and the other with implementation, are jointly responsible for the formulation and application of regulations dealing with technical standards for tanks, financial responsibility, and state program approval (state UST programs approved by the EPA are allowed to operate in lieu of the federal program since individual states are better positioned to regulating USTs than the EPA due to the sheer size of the US).[37]

In 1986, Congress empowered the EPA to respond to releases from leaking petroleum USTs and oversee rehabilitation efforts by those responsible for the pollution through the Superfund Amendments and Reauthorization Act ("SARA").[38] Empowered by SARA, the Leaking Underground Storage Tank ("LUST") Trust Fund was thus created, which was intended to fund clean-ups at sites where the owner or operator was unknown, unwilling or unable to respond, or where emergency action was required.[39] The trust fund monies can also be used by the EPA, or states that have cooperative agreements with the EPA, to fund the oversight of clean-up operations undertaken by responsible parties, or to institute actions for the recovery of costs against polluters.[40]

Financial responsibility requirements were also established in 1986. Congress directed the EPA to publish regulations requiring that all UST owners and operators be able to demonstrate their capability (through insurance or otherwise) to cover the costs of rehabilitating contaminated sites and compensating third parties, whether it be for personal injury or damage

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[34] Ibid.
[35] Patton A., et al *Report of the State Water Resources Control Board's Advisory Panel on the Leak History of New and Upgraded UST Systems (1999)* California State Water Resources Control Board available online at http://www.swrcb.ca.gov/ust/leak_prevention/docs/advisory.pdf, accessed 14 June 2013.
[36] Virginia Department of Environmental Quality, *Underground Storage Tanks*, available online at http://www.deq.virginia.gov/Programs/LandProtectionRevitalization/PetroleumProgram/StorageTanks/UndergroundStorageTanks.aspx, accessed 14 June 2013.
[37] Ibid.
[38] Supra note 27.
[39] Ibid.
[40] Supra note 26.

to property caused by leaking tanks.[41] Minimum financial responsibility limits were set depending on the volume of monthly throughputs of petroleum and various other factors.[42]

2.2 Federal requirements for USTs

As mentioned above, the EPA issued the first set of federal regulations pertaining to USTs in 1988, which were divided into three sections dealing with technical requirements, financial responsibility requirements, and state program approval requirements respectively.[43] Each of these three areas has been comprehensively regulated and informative guides and manuals designed to assist owners and operators with every aspect of compliance are available on the EPA website for download.[44] Every attempt has been made to make the information readily accessible and easy to understand, with a plethora of guidelines, factsheets, checklists, and even a technical compendium containing interpretations and guidance letters sent out by the OUST having been published online. In addition, a 36-page booklet setting out exactly what records must be maintained and by whom, and providing the contact details of certain relevant organisations such as the National Leak Prevention Association as well as industry codes and standards, *inter alia*, titled "Musts for USTs" has also been produced by the EPA and is available from a number of sources.[45] With so much information and assistance available to owners and operators there is almost no excuse for non-compliance and the risk of an incident occurring from a leaking UST is substantially reduced.

2.3 Local (state-specific) requirements for USTs

Thus, every state is catered for and regulated in terms of the abovementioned federal program. However, each state government can alternatively opt to implement its own state-specific program to replace the federal program should certain requirements be met. This has been done because due to the size of and diversity within the USA, the EPA realised that individual states were better positioned to implement and oversee the regulation of USTs within their territories. As such, legislation allows state UST programs to operate in lieu of the

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[41] Supra note 27.
[42] Supra note 26.
[43] Supra note 27.
[44] For example, one of many handbooks titled *"Operating And Maintaining UST Systems: Practical Help And Checklists*" contains a summary of the federal requirements pertaining to operation and maintenance, as well as practical hints and tips to assist those responsible in the fulfilment of their obligations. Detailed equipment and systems checklists are also provided to help owners, operators and state and EPA inspectors ensure that all technical requirements are met.
[45] This booklet is downloadable from http://www.epa.gov/oust/overview.htm

federal program once such programs have been approved by the EPA.[46] Federal regulations set standards which state programs must meet in order to be approved and, essentially, three criteria must be met, namely:

(i) the program must set standards for eight performance criteria including design, construction and notification of new USTs, leak detection and prevention and closure of USTs, that are no less stringent than federal standards[47];
(ii) it must contain adequate enforcement provisions; and
(iii) it must at least regulate the same USTs as are regulated under federal regulations.

The greatest benefit of such state programs is that the burden of implementation and enforcement is then shared between state regulators and the EPA since, once programs are approved, states take the lead in this regard.[48] Other benefits include raised awareness within each state and an increased information distribution network.

2.4 Discussion of the federal requirements

Whilst it is not within the scope of this thesis to carry out an in-depth discussion of every available item in the US toolkit, a detailed description of technical requirements or an examination of all the state-specific programs that have been implemented, the most salient aspects of the technical and financial responsibility requirements into which the federal regulations have been divided will be discussed separately below with a view to creating a comparison with the South African regulatory regime and identifying ways in which it can be improved upon. Implementation will then also be considered in order to create a well-rounded picture of the US regulatory landscape.

2.4.1 Technical requirements for USTs

The technical regulations for USTs are designed to do four things, namely, prevent accidental releases from occurring, detect leaks and spills when they do occur, ensure that contaminated sites are quickly and effectively rehabilitated, and ensure the safe decommissioning of old or unused USTs.[49]

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[46] United States Environmental Protection Agency, *State Underground Storage Tank Programs*, available online at http://www.epa.gov/oust/fsstates.htm, accessed 23 June 2013.
[47] United States Federal Regulations 40 CRF Part 281, Subpart A, s281.11.
[48] Supra note 46.
[49] Supra note 27.

A distinction is made between “old” and “new” UST systems for the purposes of compliance with the regulations. Any USTs installed after the publication of the EPA’s first set of regulations on 22 December 1988 are considered “new” systems, while those installed prior to that date are referred to as “old” – the distinction is relevant in that the requirements concerning installation, leak detection, spill, overfill and corrosion protection differ according to whether the UST is new or old. Bearing that in mind, what follows is a short discussion of each of the four subsections of the technical requirements, as well as a brief overview of the US industry codes and standards.

2.4.1.1 Preventing releases

The US regulations aimed at preventing releases deal primarily with the proper installation of UST systems, correct filling procedures and the prevention of spills, overfill and corrosion – each of which will be discussed below.[50] However, UST systems must also be designed and constructed in accordance with certain industry codes and standards and according to manufacturer’s instructions to ensure uniformity throughout the country.[51]

As mentioned above, the distinction drawn between old and new USTs means differing requirements when it comes to installation. When installing a new UST, an owner or operator must meet four requirements, namely:

i) the tank and piping must be properly installed by a qualified installer who follows industry codes and standards. The owner or operator is then required to certify that this has been done on a notification form which is available from the relevant regulatory authority in each state.[52]

ii) the UST system must have release or leak detection methods that meet certain performance requirements described in the federal regulations. These methods and requirements will be discussed more fully below under section 2.2.1.2;

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[50] United States Environmental Protection Agency, *Preventing UST Releases*, available online at http://www.epa.gov/oust/fsprevnt.htm, accessed 17 June 2013. The intended function and proper use of all of the devices and methods mentioned in the text above are fully elaborated upon in the regulations and related handbooks and comprehensive lists of professionals and organisations that can provide assistance to owners and operators in attaining compliance are provided. The EPA has, as such, provided well indexed and thorough information for owners and operators.

[51] Ibid.

[52] United States Environmental Protection Agency, *Musts for USTs* (1995) available online at http://www.epa.gov/oust/ustsystm/index.htm, accessed 17 June 2013.

iii) the UST must have devices that provide spill and overfill protection. Spill protection is usually effected through the use of a catchment basin - a container positioned around the fill pipe designed to catch drips or spills that occur when the delivery hose is disconnected from the fill pipe.[53] Overfill protection devices are devices that either automatically switch off the flow of product into the UST, restrict the product's flow or sound an alarm when the tank is almost full[54] with the intention being the prevention of spillage caused by a larger volume of product being offloaded that what the tank can accommodate. In addition, the federal regulations require that industry standards for correct filling practices be followed at all times (for example, the transfer operation must be monitored continuously)[55]; and

iv) all metal components of new UST systems that are in contact with the ground and routinely contain product must have corrosion protection[56] by way of meeting one of three performance standards i.e.

- the tank and piping may be made of non-corrodible material, such as fiberglass, or completely enclosed in such non-corrodible material;
- should the tank and piping be made of steel, a corrosion-resistant coating may be applied as well as cathodic protection; or
- alternatively for steel tanks, a thick layer of a non-corrodible material such ACT-100® may be applied (this option does not apply to piping).[57]

Old USTs (i.e. those that were installed prior to 22 December 1988), on the other hand, had to be upgraded to meet certain compliance deadlines, namely:

i) they had to be upgraded to have leak detection by December 1993. Leak detection requirements were similar to those for new tanks and piping, with only slightly less stringent monitoring having been required for the first ten years after upgrading the UST with spill, overfill, and corrosion protection. After 10 years, however, the monitoring methods had to be identical to those used for new USTs; and

[53] Supra note 50.
[54] Supra note 51.
[55] United States Federal Regulations 40 CRF Part 280, Subpart B, s280.20(c). See also note 51.
[56] United States Federal Regulations 40 CRF Part 280, Subpart B, s280.20(3). See also note 49.
[57] United States Federal Regulations 40 CRF Part 280, Subpart B, s280.20. See also note 51.

ii) they had to be upgraded to have spill, overfill, and corrosion protection by December 1998 with the requirements for spill and overfill protection being the exactly the same as those for new USTs.[58] Corrosion protection requirements were considered to have been met if one of the performance standards for new USTs were met. However, since it was considered impractical to add outer coatings to USTs that had already been installed, owners and operators were given a choice between three alternative methods to add corrosion protection to existing tanks, namely 1) adding cathodic protection; 2) adding an interior lining; or 3) adding cathodic protection as well as an interior lining. Prior to adding cathodic protection, the integrity of the tank had to be tested using one of a number of approved methods.[59]

If the upgrades were not completed by the stipulated dates, the old USTs had to be replaced with new ones or permanently closed. Closure will be dealt with in more detail below.

2.4.1.2 Detecting releases

As mentioned above, all USTs, both old and new, are required to have leak detection devices and procedures in place to ensure that any leaks are discovered and stopped as quickly and efficiently as possible.

According to the US regulations, leak detection systems must meet the three following requirements, namely:

i) they must be able to detect a leak from any portion of the tank or its piping that routinely contains petroleum (and this must be determinable at least every 30 days);
ii) they must be installed, calibrated, operated and maintained in accordance with the manufacturer's instructions; and
iii) they must meet certain performance requirements described in the federal regulations.[60] Manufacturers or installers may provide certification that release detection equipment meets these performance requirements but there are also impartial experts who can be hired to test the equipment and certify that the requirements have been met. Such certification is important since certain leak

[58] Supra note 52.
[59] Supra note 50.
[60] Supra note 52.

> detection methods may not function with certain types of tank, piping or product or with operations that have a high throughput or certain tank sizes.[61]

Owners and operators are given several choices when it comes to acceptable leak detection methods to be used on the piping in their UST systems. Tanks, however, must be monitored on a monthly basis,[62] which monitoring must include at least one of various federally-approved leak detection methods or a detection method approved by the relevant state authority. These methods include, amongst others, testing for vapours in the soil, monitoring groundwater for the presence of liquid product, automatic tank gauging, statistical inventory reconciliation and secondary containment of the tank with interstitial monitoring.[63]

In addition to installing approved leak detection systems and equipment, operators and owners are required to ensure that such equipment is properly operated and maintained over time. To this end, the EPA has produced a manual containing checklists of actions that should be taken for the proper operation and maintenance of each of the various leak detection methods as well as lists of all the records that should keep,[64] which include the previous year's monitoring results, any certifications made by the manufacturers of the leak detection devices, and records of any maintenance or repair conducted on the UST system.[65]

Should a possible leak be detected, the potential incident must be reported to the regulatory authority in the relevant state within 24 hours.[66] Owners and operators are then required to determine whether there is an actual leak through site inspection and tightness testing[67] of the

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[61] United States Federal Regulations 40 CRF Part 280, Subpart D, s280.40. See also United States Environmental Protection Agency, *Operating and Maintaining Underground Storage Tank Systems*, available online at http://www.epa.gov/oust/ustsystm/index.htm, accessed 17 June 2013. An independent group of experts frequently evaluates third-party certifications and updates a list of reliable independent contractors - available to view online at http://www.nwglde.org/, accessed 13 June 2013.

[62] As mentioned above, less stringent monitoring requirements applied to old USTs for the first ten years after they had been upgraded with spill, overfill, and corrosion protection. However, since 10 years have passed since the deadline for such upgrades was reached, these less stringent requirements are no longer applicable to any tanks in the US. The transition process was simply noted as a possibility to be drawn upon by South African lawmakers.

[63] United States Federal Regulations 40 CRF Part 280, Subpart D, s280.43. As mentioned above, all new tanks i.e. those installed after December 1988 must have secondary containment and undertake interstitial monitoring.

[64] United States Environmental Protection Agency, *Detecting UST Releases*, available online at http://www.epa.gov/oust/fsprevnt.htm, accessed 17 June 2013. The manual referred to is titled *Operating and Maintaining Underground Storage Tank Systems* and is available online at http://www.epa.gov/oust/ustsystm/index.htm

[65] United States Federal Regulations 40 CRF Part 280, Subpart D, s280.45. See also note 64.

[66] Supra note 64.

[67] Tightness testing is a specific type of leak detection.

entire UST system and, if a leak is confirmed, must comply with the regulations regarding response to and clean-up of releases.[68]

2.4.1.3 Response to and cleaning up releases

The federal regulations require UST owners and operators to report actual or suspected releases, spills or overfills[69], unusual operating conditions (such as the unexplained presence of water in the UST), inventory control data that does not correlate with a previous month's results or defective monitoring devices to the implementing agency in their state within 24 hours.[70] As mentioned above, an investigation must then be undertaken (involving a system test and site check) to confirm all suspected releases and the outcome thereof must be reported to the authority within 7 days (or such other reasonable time as the authority may stipulate).[71]

If the results of the investigation do not indicate that a release has taken place, no further investigation is required.[72] If, however, the test results and site inspection indicate that a release has occurred, owners and operators must begin corrective action in accordance with the regulations.[73] Correction actions are divided into short-term and long-term actions. Initial response action that must be undertaken within 24 hours of the confirmed release includes reporting the release to the implementing authority, taking preventive action to thwart the further release of product into the environment, and identifying and diminishing fire, explosion and vapour hazards.[74] Once these actions have been completed, specified initial abatement measures must commence which include removing as much petroleum from the UST system as is necessary to prevent a further release, inspecting aboveground (or visible belowground) releases and preventing their further progress into the environment, continuing to monitor and mitigate against fire and explosive hazards and investigating to determine the possible presence of free product.[75]

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[68] Supra note 52.
[69] Spills or overfills of less than 25 gallons of petroleum must be immediately contained and cleaned up. If cleanup cannot be accomplished within 24 hours, or another reasonable time period established by the implementing agency, owners and operators must immediately notify the implementing agency according to United States Federal Regulations 40 CRF Part 280, Subpart E, s280.53(b).
[70] United States Federal Regulations 40 CRF Part 280, Subpart E, s280.50.
[71] United States Federal Regulations 40 CRF Part 280, Subpart E, s280.52.
[72] United States Federal Regulations 40 CRF Part 280, Subpart E, s280.52(b)(2).
[73] United States Federal Regulations 40 CRF Part 280, Subpart E, s280.52(b)(1). Note: USTs excluded under s280.10(b) and UST systems subject to RCRA Subtitle C corrective action requirements under section 3004(u) of the Resource Conservation and Recovery Act, as amended, are excluded from the operation of the regulations.
[74] United States Federal Regulations 40 CRF Part 280, Subpart E, s280.61.
[75] United States Federal Regulations 40 CRF Part 280, Subpart E, s280.62(a).

Within 20 days of confirmation of a release, owners and operators must submit a report to the regulatory authority in their area setting out which abatement measures have been undertaken and any resulting data or records.[76] During this time and within 45 days of release confirmation, an initial site characterisation report must also be compiled and submitted, which report should include information on, *inter alia*, the estimated quantity of the release as well as data on "surrounding populations, water quality, use and approximate locations of wells potentially affected by the release, subsurface soil conditions, locations of subsurface sewers, climatological conditions and land use."[77]

Where investigations have revealed the presence of free product, this must be removed in a manner that meets certain safety requirements and minimises the further spread of contamination by using appropriate recovery and disposal techniques.[78] Implementing agencies may also require owners and operators to prepare and submit a corrective action plan setting out how they intend to rehabilitate a contaminated site.[79] The plan's approval is dependent on whether it adequately addresses human health and safety and environmental protection.

Additionally, for each release that requires a corrective action plan, the implementing agency must notify the public in the area that will be affected by the rehabilitative action.[80] Notice may be effected in a number of ways and information regarding the nature of the release and corrective plan must be made available for inspection upon request.[81] Prior to the approval of a corrective action plan, the regulatory authority may also hold a public meeting and take suggestions on proposed remedial actions and it must give public notice if the implementation of an approved plan falls short of its objectives and the authority is considering terminating the plan.[82]

2.4.1.4 Decommissioning

USTs in the United States can be closed on either a permanent or a temporary basis.

(i) Temporary Closure

[76] United States Federal Regulations 40 CRF Part 280, Subpart E, s280.62(b).
[77] United States Federal Regulations 40 CRF Part 280, Subpart E, s280.63.
[78] United States Federal Regulations 40 CRF Part 280, Subpart E, s280.64.
[79] United States Federal Regulations 40 CRF Part 280, Subpart E, s280.66.
[80] United States Federal Regulations 40 CRF Part 280, Subpart E, s280.67.
[81] Ibid.
[82] Ibid.

An old UST that has not been upgraded may be temporarily closed for a maximum of 12 months, after which it must be permanently closed. New USTs or old ones that have been upgraded according to the procedures set out above, however, may remain "temporarily" closed indefinitely so long as the following requirements for temporary closure are met:[83]

(a) operation and maintenance of corrosion protection and leak detection (unless the UST is empty) must continue in accordance with the regulations;

(b) if the UST remains temporarily closed for more than 3 months, vent lines must be left open and functioning, and all other lines, pumps and ancillary equipment must be capped and secured.[84]

(ii) Permanent Closure

An owner or operator may choose to close a UST permanently for a number of reasons, in which case the following requirements should be met:

(a) the regulatory authority must be notified at least 30 days before closure is effected;

(b) owners and operators must determine whether there has been a release by testing the surrounding environment where contamination is most likely to be present. If contamination if present, corrective action must be taken in accordance with the regulations[85];

(c) the UST may either be removed from, or left in the ground. Either way, the tank must be emptied and cleaned by removing all liquids, dangerous vapour levels and accumulated sludges[86] and if left in the ground and taken out of service completely (in other words, not used for another purpose such as storage of a non-regulated substance), the UST must be filled with a chemically inactive solid substance.[87]

2.4.2 Financial responsibility regulations for USTs

[83] United States Federal Regulations 40 CRF Part 280, Subpart G, s280.70(c). See also note 52.
[84] United States Federal Regulations 40 CRF Part 280, Subpart G, s280.70(a).
[85] United States Federal Regulations 40 CRF Part 280, Subpart G, s280.72(a).
[86] Standard safety procedures must be followed when carrying out these potentially hazardous activities and the EPA provides guidance on good closure practices (see pages 30 and 31 of the "*Musts for USTs*" handbook, supra note 52.
[87] United States Federal Regulations 40 CRF Part 280, Subpart G, s280.72(b).

The EPA estimated in 2007 that it costs an average of approximately $125,000 to fully clean up a release from a UST.[88] States in the US estimated that to fully clean up only 54,000 of the approximately 117,000 releases known to them as of September 30, 2005, would cost about $12 billion.[89] That is without any additional claims for damages that may arise from the contamination as a result of personal injury claims or claims for damage to property.

The regulations establishing financial responsibility are intended to ensure that in the event of a contaminating incident, owner and operators have the financial resources available to cover the costs of rehabilitating contaminated sites including all environmental damage and compensating third parties for injury to their property or themselves.[90] The amount of coverage required is determined by the size and type of the business owning or operating the particular UST (for example, petroleum producers, refiners and marketers are required to have greater per-occurrence coverage than non-marketers).[91] The EPA has produced a handbook titled “Dollars and Sense” that clearly explains the requirements.[92]

Owners and operators have several options for demonstrating financial responsibility, each of which is described fully in the regulations.[93] Options include obtaining insurance coverage from a private insurer or risk retention group; demonstrating self-insurance by passing a financial test; obtaining corporate guarantees, surety bonds, or letters of credit; placing the required amount into a trust fund administered by a third party; or seeking coverage provided by state financial assurance funds.

Records of financial responsibility coverage must be kept at the UST site or place of business, such records to include a current certification of financial responsibility along with any other documentation validating the method of financial responsibility and providing details of the coverage, such as insurance agreements.[94] The records must be maintained until the UST is permanently closed.

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[88] United States Government Accountability Office GAO-07-152 *Report to Congressional Requesters on Leaking Underground Storage Tanks* (2007). Note that $125,000 equates to approximately R1,3 million today – and that estimate was given 7 years ago.
[89] Ibid.
[90] United States Environmental Protection Agency, *Financial Responsibility for Owners and Operators* available online at http://www.epa.gov/oust/ustsystm/finresp.htm, accessed 24 June 2013.
[91] United States Federal Regulations 40 CRF Part 280, Subpart H, s280.93.
[92] This booklet is available for download on the EPA website.
[93] United States Federal Regulations 40 CRF Part 280, Subpart H, s280.98 – s280.107.
[94] United States Federal Regulations 40 CRF Part 280, Subpart H, s280.111. See also United States Environmental Protection Agency, *Dollars and Sense* (1995) available online at http://www.epa.gov/oust/ustsystm/index.htm, accessed 17 June 2013.

The financial responsibility requirements for owners and operators should not be confused with the LUST Trust Fund, which, as mentioned above, is funded by a 0.1 cent tax on each gallon of motor fuel sold nationwide and is used to pay for clean-ups in instances where the owner is unknown, unwilling or unable to respond, or to enforce and oversee clean-ups by intractable owners, or to fund inspections and other preventive activities.[95] Clean-up costs covered by the fund include only the actual cost of the cleanup, temporary or permanent relocation of residents, alternative household water supplies, and any exposure assessment.[96] There are also certain provisions in the regulations making recovery of costs possible so that if, after LUST Trust Fund monies have been used to clean up a release and a viable party responsible for the release is subsequently found, the EPA may take action to recover its costs from said party.[97] Third party claims are, however, not recoverable from the fund.

2.3 Compliance and Enforcement

As mentioned, in the absence of a state program, the task of ensuring compliance with the federal regulations and of enforcing the law against those who derogate from them falls to the EPA's Office of Enforcement and Compliance Assurance ("OECA").

OECA uses various methods to achieve compliance, including assistance, monitoring and incentives. Compliance assistance is essentially recommendations that are provided to the regulated community on how best to achieve compliance in the most cost-effective way. It includes information, guidelines and technical assistance that try to assist owners and operators in understanding and meeting their obligations.[98] Compliance monitoring involves, amongst other things, on-site inspections conducted by qualified inspectors, determination of the compliance status of sites and entry of these results into a national data base and response to complaints by the public.[99] Finally, compliance incentives encourage government, industry and businesses to assess their compliance with regulations, determine any environmental hazards or issues and remedy them as soon as possible. For example, the EPA will forego or significantly reduce fines where businesses voluntarily report and correct transgressions of environmental law.[100] There is therefore a great incentive for self-regulation. Other incentive programs include environmental management systems (which The International Organization

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[95] United States Environmental Protection Agency, *Leaking Underground Storage Tank (LUST) Trust Fund*, available online at http://www.epa.gov/oust/ltffacts.htm accessed on 23 June 2013.
[96] Ibid.
[97] Ibid.
[98] United States Environmental Protection Agency, *Compliance Basic Information,* available online at http://www.epa.gov/compliance/basics/compliance.html, accessed 24 June 2013.
[99] Ibid.
[100] United States Environmental Protection Agency *Incentives Basic Information,* available online at http://www.epa.gov/compliance/basics/incentives.html, accessed on 24 June 2013.

for Standardization (ISO) defines as "that part of the overall practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy"[101]), pollution prevention and the small communities[102] policy.[103]

Enforcement, on the other hand, takes the form of various types of actions. Civil administrative actions are non-judicial in nature, are taken by either the EPA or a state and may involve sending a notice of violation or an administrative order to take some kind of action to the offending party.[104]

Alternatively, judicial civil actions are filed by the U.S. Department of Justice on behalf of the EPA and may be taken against those who have failed to comply with legal requirements, an administrative order, or who owe the EPA costs for rehabilitating a contaminated site.[105] Relief is usually given in the form of monetary penalties or final orders. Finally, the state may choose to take criminal action against perpetrators of serious environmental violations and conviction can result in the imposition of fines or a term of imprisonment.[106]

In terms of record-keeping, the EPA produces annual reports announcing the results of compliance and enforcement programs and activities. In addition, all data and information used in the production of these reports in stored in several national data systems.[107]

2.4 Industry Codes and Standards

[101] Tamura T., *Environmental Management Systems (EMS)* (2000) Technical Workbook on Environmental Management Tools for Decision Analysis available online at http://www.unep.or.jp/ietc/Publications/techpublications/TechPub-14/1-EMS1.asp, accessed 25 June 2013.

[102] The small communities policy is explained as follows on the EPA website: “Small communities and small local government often have more difficulty complying with environmental regulations than larger local governments do. They disproportionately face challenges related to technical, managerial and financial capacity that can result in environmental violations despite their best efforts. Small local governments may not have trained environmental professionals on staff. Their part-time elected officials may be unaware of environmental requirements that apply to governmental operations. If told they are in noncompliance, they may not know how to correct their problems. To promote improved environmental compliance among small communities and small local governments, EPA has taken action to increase their awareness of their environmental responsibilities, provide them the information they need to correct violations, and provide them with a framework for correcting violations in the context of achieving and sustaining comprehensive compliance.” Obtained online at http://www.epa.gov/oecaerth/incentives/smallcommunities/ on 24 June 2013.

[103] Supra note 100.

[104] United States Environmental Protection Agency *Enforcement Basic Information,* available online at http://www.epa.gov/enforcement/basics.html, accessed 24 June 2013.

[105] Ibid.

[106] Ibid.

[107] Ibid.

In addition to the detailed and broad-ranging regulations and guidelines established by the EPA, a multitude of industry codes and standards have also been developed over the years on matters ranging from installation, tank filling practices, corrosion protection, closure, assessing tank integrity and repairing tanks to spill and overfill prevention and lining the interior of tanks. Compliance with the codes and standards, although they are not themselves federal regulations, is mandated by the State as they are regarded as an expeditious means for improving or developing alternative methods of UST regulation.[108] Well-qualified, nationally recognised institutions and organisations are relied upon to develop the codes, which are updated from time to time. Owners are encouraged, but are not required, to use the most up-to-date versions of the codes available.[109] Thus, the safety of those involved in the industry from installation contractors to inspectors, as well as the communities in surrounding areas, the environment and the interests of owners and operators who would otherwise be liable for expensive remediation costs, is safeguarded.[110]

2.5 Conclusion

What is clear from the aforegoing is that the US has developed an integrated, highly detailed body of regulations that brings together various facets such as oversight by a national authority, self-regulation, checks and balances and persistent monitoring. The overarching regulations, although initiated at federal government level, can be substituted by state-level regulations if certain requirements are met. This greatly alleviates the burden placed on the OECA to ensure nation-wide compliance with the regulations since the state government takes the lead in terms of implementation once state-specific regulations are approved.

Every phase of a USTs lifecycle has been taken into account when drafting regulations and guides, from installation to decommissioning, and the approach to dealing with releases has been logically divided into categories pertaining to prevention, detection and response, enabling a systematic and distinct approach to dealing with each of them to be created.

Assistance in compliance is also ubiquitous throughout the US system and is of paramount importance – the regulators clearly demonstrate an aspiration to ensure compliance amongst the regulated community through a plethora of downloadable guidelines and other tools designed to inform and support and ensure that being in compliance is not overly financially burdensome. Every effort is made to aid and incentivise those responsible for compliance

[108] United States Environmental Protection Agency Industry Codes and Standards for UST Systems, available online at http://www.epa.gov/oust/cmplastc/standard.htm, accessed 24 June 2013.
[109] Ibid.
[110] For a comprehensive list of these industry codes see page 31 of "*Musts for USTs*" supra note 52.

which, when compared to what is available in South Africa, is truly something to aspire towards.

CHAPTER 3

3. THE SOUTH AFRICAN REGULATORY REGIME

3.1 History of the South African situation

Most of the tanks installed the world over during the fifties, sixties and seventies did not have adequate corrosion protection and since fuel leakage is caused largely by the corrosion of the tank wall, leaks were a global problem. South Africa was no exception and the majority of USTs installed during this time were constructed of welded steel, coated with epoxy coal tar (used for protection against moisture).[111] During the early 1980s, the technology and products used to protect the piping improved, but the same could not be said of the majority of tanks.[112] As a result, South Africa, like the US, faced and still faces, a major on-going environmental threat in the form of damaged, corroded and corroding USTs. Unlike the US, however, South Africa has yet to draft specific regulations or designate a specific regulatory authority to effectively deal with the problem.

However, there does exist a plethora of legal instruments which seek to control pollution in more general terms in South Africa.[113] These laws are generally grouped according to the environmental media which they seek to regulate, namely air, land or water, and are underscored by common law principles such as the general duty of care not to cause environmental harm[114] and the polluter pays principle.

Since this thesis is primarily concerned with the pollution of water resources by petrochemicals leaking from USTs, what follows is an exposition of the various common law rules, statutes and principles of law pertinent to such pollution in South Africa. Lastly, although not legally binding and therefore perhaps not relevant to a discussion on the *current* legal regime surrounding the control of pollution from leaking USTs, certain industry-specific "best practice guidelines" and other measures aimed at preventing leaks from USTs will also be examined with a view to establishing a clear overview of all the regulatory tools that are available in South Africa and their potential suitability as reference documents for drafters of legislation pertaining to this issue in the future.

3.2 The Common Law

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[111] Progressive Epoxy Polimers Inc, *Coal Tar Epoxy Info Page*, available online at http://www.epoxyproducts.com/coaltar.html, accessed 26 June 2013.
[112] Supra note 7.
[113] Glazewski, J *Environmental Law in South Africa* (2013) Lexis Nexis at 20-3.
[114] Ibid.

As mentioned above, whilst there are water pollution-controlling provisions in the statutes of South Africa, these must always be contextualised by the common law, the significance of which was reiterated in *Rainbow Chicken Farm (Pty) Ltd v Mediterranean D Woollen Mills (Pty) Ltd*[115] where it was held that "[the] producer of effluent, quite apart from statutory duties imposed on him by sections 21(1) and (2) [of the 1956 Water Act] owes a common law duty of care towards others."[116]

Nuisance and neighbour law, as well as the law of delict are of particular relevance in cases of pollution, including water pollution. Each of these aspects of the common law will be briefly considered below, while the remedies provided thereby to those affected by pollution will be considered in chapter 4.

The law of delict holds that a defendant is liable for damage wrongfully caused by an intentional or negligent act to the person or property of another.[117] There are five generally accepted elements of a delict which are, in brief, an act or omission, wrongfulness, fault in the form of either intention or negligence, harm suffered by a person or to property that is quantifiable in monetary terms and a causal link between the act or omission and the harm suffered (in both the factual and the legal sense).[118] The problem for plaintiffs in delictual actions pertaining to pollution is that proving all the elements of a delict in these cases can be incredibly challenging, in particular as regards proving fault, showing causation between the harm suffered and the pollution causing incident or activity and quantifying patrimonial loss.[119] As such, satisfaction in such claims is often not realised, or not realised in full, by the plaintiffs. In addition, the common law of delict is inadequate in the sense that it is a reactionary solution and only becomes relevant once harm has already been caused. As mentioned above, the aim in terms of environmental contamination is very heavily on prevention as opposed to cure – something for which the law of delict does not cater.

Moving now to consider the law of nuisance, it is worth pointing out that three distinct forms exist.[120] Public nuisance is defined as "an act or omission or state of affairs [which] impedes, offends, endangers or inconveniences the public at large", while private nuisance is defined as "an act or omission or condition or state of affairs [which] materially inconveniences another in the ordinary comfortable use or enjoyment of land or premises.[121] A third form i.e. statutory

[115] 1963 (1) SA 201 (N) at 205A.
[116] Supra note 113 at 24-9.
[117] Ibid at 20-7.
[118] Ibid.
[119] Ibid at 20-11.
[120] Church J and Church J., Nuisance (ch 19 LAWSA (2nd edn) at para 160, cited in Glazewski, supra note 113 at 20-22.
[121] Ibid.

nuisance is defined as "a condition or state of affairs which a legislative authority has declared to be a nuisance."[122] Only unreasonable interferences with a landowner's right to enjoy his land will be penalised, and landowners must accept that some interferences must be tolerated.[123] It is clear from the definitions that both public and private nuisance could currently be relied upon by plaintiffs in the case of pollution by petrochemicals of private land or of their surrounding environment and water resources (leading to their endangerment and inconvenience). Statutory nuisance would only become relevant in circumstances where the legislature had declared leaking USTs to be a nuisance.

Similarly to nuisance, neighbour law affirms that property rights are not absolute, and one cannot use one's property in such a way that it is harmful to another.[124] This is clearly relevant in the context of pollution. Should a UST on the property of a fuel retailer leak and cause contamination of a shared water resource or damage to the surrounding environment and properties, then recourse could be had to the principles of the law of neighbours. However, once again, reasonable interferences must be tolerated by adjoining landowners. However, it is submitted that petrochemical contamination is of such a devastating and enduring nature that it would never be considered a tolerable interference. Moreover, the common law is inadequate for dealing with these complex, technical problems.

3.3 Statutes

3.3.1 The Constitution, Act 104 of 1996

In terms of section 27 of the Constitution[125], access to water is enshrined as a human right in South Africa. As a result, irrespective of who may be responsible for polluting water supplies, the government remains ultimately responsible for ensuring that its citizens have access to sufficient clean, potable water to meet their daily needs – something which was brought home recently in the Carolina acid-mine drainage cases.[126]

Section 24 further states that everyone has the right "…to an environment that is not harmful to their health or well-being [and] to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that …prevent pollution and ecological degradation."

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[122] Ibid.
[123] Supra note 113 at 20-22.
[124] Ibid.
[125] The Constitution of the Republic of South Africa Act 104 of 1996 (cited hereafter as "the Constitution").
[126] *Federation for Sustainable Environment and Another v Minister of Water Affairs and Others* [2012] ZAGPPHC 170.

The meaning of the term "well-being" has been given a broad definition by the courts, not that a wide interpretation of the term would even be necessary to invoke the protection of this section since the contamination of water sources and soil by carcinogenic substances would undoubtedly constitute an infringement of an individual's right to an environment that is not harmful to their health. The right to have the environment protected through "reasonable legislative and other measures" would also, arguably, be infringed in circumstances where a UST leaks in South Africa because, as will be discussed in further detail below, the protective measures currently in place in South Africa do not extend to older generation USTs and are lacking in certain fundamental ways, for example, in that no mandatory integrity testing of tanks and related pipework is required.

3.3.2 The National Environmental Management Act 19 of 1998

3.3.2.1 Environmental Impact Assessment requirements

In June 2010, the Minister of Water and Environmental Affairs promulgated the new EIA Regulations in terms of the NEMA.[127] Contained in listing notice number 1 to the regulations (activities for which a basic assessment would be required) are activity 13 for construction ("[t]he construction of facilities or infrastructure for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 but not exceeding 500 cubic metres"); activity 27 for decommissioning ("[t]he decommissioning[128] of existing facilities or infrastructure, for storage, or storage and handling, of dangerous goods of more than 80 cubic metres"); and activity 42 for expansion of USTs ("[t]he expansion of facilities for the storage, or storage and handling, of a dangerous good, where the capacity of such storage facility will be expanded by 80 cubic metres or more").[129]

Contained in listing notice 2 (activities for which a Scoping/Environment Impact Reporting ("S&EIR") process must be conducted due to their being typically large scale or potentially highly polluting) is the "construction of facilities or infrastructure for the storage, or storage and

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[127] In 2009 President Jacob Zuma announced the establishment of the Ministry of Water and Environmental Affairs. The department was created by combining the former Department of Environmental Affairs and Tourism with the former Department of Water Affairs and Forestry. The Minister and Deputy Minister of Water and Environmental Affairs oversee the work of two separate departments, namely the Department of Environmental Affairs and the Department of Water Affairs and the Ministry's budget is under the Department of Water Affairs - Department of Environmental Affairs website, https://www.environment.gov.za/aboutus/department, accessed on 23 June 2014.

[128] "decommissioning" in terms of the regulations is defined as to "take out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily re-commissioned".

[129] Listing Notice 1: Government Notice R.544 in Government Gazette 33306 of 18 June 2010, List of Activities and Competent Authorities identified in terms of sections 24(2) AND 24D of NEMA.

handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres."[130]

'"[D]angerous goods" as defined in the regulations means "goods containing any of the substances as contemplated in South African National Standard No. 10234, supplement 2008 1.00…and where the presence of such goods, regardless of quantity, in a blend or mixture, causes such blend or mixture to have one or more of the [following] characteristics…namely physical hazards, health hazards or environmental hazards." Since petroleum products are amongst the substances contemplated in the aforementioned national standard, the regulations are applicable to the construction, decommissioning and expansion of USTs meeting the abovementioned specifications and authorisation would have to be obtained from the competent authority, in this case being the environmental authority in the province in which the activity is being undertaken.

Notably, whereas in terms of the previous 2006 regulations, the construction of "any…facility for the underground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin"[131] triggered the need for an EIA in terms of the procedure described in the regulations, the need for a basic assessment in terms of the 2010 regulations is only triggered where the containers constructed are between 80 and 500 cubic metres combined and the need for an S&EIR is only triggered where the containers constructed exceed 500 cubic metres, meaning that smaller service stations are subject to a far less stringent environmental management process that the larger ones, if anything at all – notwithstanding the fact that smaller tanks are just as likely to leak as larger ones.

Moreover, it is only the installation of new USTs that would trigger the need for environmental authorisation. USTs that were installed prior to the coming into effect of the 2006 regulations would only have had to comply with whatever conditions may have been deemed necessary in terms of an environmental authorisation issued under the Environment Conservation Act[132] ("ECA") at the time of their installation. Tank technology, installation, maintenance and monitoring processes, as well as knowledge and understanding of the potential environmental impacts of a leak have all advanced so much since then that it seems logical that the outdated tanks should be upgraded accordingly and made subject to conditions that reflect current industry standards and awareness.

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[130] Listing Notice 2: Government Notice R.545 in Government Gazette 33306 of 18 June 2010, List of Activities and Competent Authorities identified in terms of sections 24(2) AND 24D of NEMA.
[131] Government Notice R387 in Government Gazette 28753 of 21 April 2006, List of Activities and Competent Authorities identified in terms of sections 24 AND 24D of NEMA.
[132] Act 73 of 1989.

Furthermore, even if an environmental authorisation is required in terms of the new 2010 NEMA regulations, once granted, there are no mandatory requirements for monitoring or testing the integrity of tanks. Improvised provisions may be specifically ascribed to a particular applicant in terms of the conditions of the authorisation but even so, these may vary from province to province and amongst responsible officials and are in no way standardised. Most notably, they are, once again, issued for new sites only, meaning that old
sites are not subject to any monitoring requirements, standardised or otherwise.[133] Thus, although EIAs are undoubtedly a positive aspect of the South African environmental regulatory regime, industry-specific regulations with detailed specifications for the safe storage and handling of petrochemicals are nevertheless required in order to properly safeguard the environment.

3.3.2.2 Other relevant provisions of NEMA

In addition to the regulations dealt with above, certain general provisions of NEMA are also applicable to the topic under discussion. For example, section 28 imposes a statutory duty of care on "[e]very person who causes, has caused or may cause significant pollution or degradation of the environment" and mandates that reasonable measures to prevent such pollution from occurring, continuing or recurring must be taken by such persons. The section is also made applicable to significant pollution that occurred before the commencement of the Act, which is obviously relevant insofar as owners and operators of older generation USTs are concerned. The liability implications of section 28 will be more fully discussed in paragraph 4.4. below.

3.3.2.2.1 Emergency Incidents

Furthermore, section 30 of NEMA deals with the clean-up of contamination and control of emergency incidents generally. "Incident" is defined in section 30 as an 'unexpected sudden occurrence including a *major* emission, fire or explosion leading to serious danger to the public or potentially *serious* pollution of or detriment to the environment, whether immediate or delayed' (own emphasis). The wording of this definition and specifically the use of the words "major" and "serious" leave it open to interpretation as to whether minor spills or leaks are covered by the section. There is also no indication given in the Act of what constitutes a major emission, so in the case of USTs, if a tank has a pin-prick sized hole which leaks a small

[133] Note that the conditions prescribed in an environmental authorisation may take precedence over the requirements of the SABS Codes referred to below, as per the introduction to SABS 089 Part 3: *The installation of underground storage tanks, pumps/dispensers and pipework at service station and consumer installations* (2010).

amount of petroleum over a long period of time, would that constitute a major emission and fall within the parameters of this section?

In addition, this is a non-specific legislative measure and there is nothing in this or any other Act that deals explicitly with hydrocarbon contamination. This is particularly problematic when one considers the non-specific nature of the provisions of sections 30, for example section 30(4) provides that "the responsible person[134]…must as soon as reasonably practicable after knowledge of the incident (a) take all reasonable measures to contain and minimise the effects of the incident, including its effects on the environment and any risks posed by the incident to the health, safety and property of persons; (b) undertake clean-up procedures; (c) remedy the effects of the incident; and (d) assess the immediate and long-term effects of the incident on the environment and public health."[135]

The non-specific instructions to "take all reasonable measures to contain the effects of the incident" and "undertake clean-up procedures" mean that each "responsible person" is left to his or her own devices in determining what such clean-up procedures should be and, although he or she may later be held to account for not having taking such steps as the reasonable man would have taken, by that stage the environmental damage would already have been perpetrated and, in most cases and for the most part, would be irreversible. It is also dubious whether such responsible persons would be at all qualified or capable of making an assessment of the immediate and long-term effects of the incident on the environment or public health and it seems rather valueless that they should be made to do so. What is required instead is a specific set of instructions to be followed to the letter in the case of any spill or leak, be it major or minor (since even minor occurrences of this nature can greatly impact the surrounding environment), which instructions should be incorporated into an industry-specific set of regulations, to be revised and updated on a regular basis as best practice improves and evolves.

3.3.2.2.2 Integrated pollution control and the NEMA principles

Finally, in a bid to entrench integrated pollution control (IPC) into our legal system, the legislature incorporated certain fundamental principles into NEMA, all of which solidify the basic tenants of IPC, which has been expressed as such: "…a national practice or system

[134] "responsible person" is defined in the Act as any person who (i) is responsible for the incident; (ii) owns any hazardous substance involved in the incident; or (iii) was in control of any hazardous substance involved in the incident at the time of the incident.
[135] S30(4) of NEMA.

which takes into account the effects of activities and substances on the total environment as well as the whole commercial and environmental life cycles of substances when assessing the risks they pose and when developing and implementing controls to limit their release."[136] IPC can take many forms but in terms of legal integration, it relates to the "…adoption of uniform norms and standards which are applied in a consistent way to pollution of all environmental media."[137]

Such is the case with the principles adopted in terms of NEMA, the following three of which are applicable to contamination caused by leaking USTs and pollution in general. The "polluter pays" principle holds that the costs of remedying or mitigating pollution, environmental degradation and consequent adverse health effects must be paid for by those responsible for causing the harm.[138] The "preventive principle", which is described as the notion that pollution and degradation of the environment should be avoided and where that is not possible, should be minimised and remedied[139], and finally, the "precautionary principle" which is defined as "a risk-averse and cautious approach…which takes into account the limits of current knowledge about the consequences of decisions and actions."[140]

These principles should form the basis of any legislation drafted to combat pollution and specifically, the proposed regulatory regime for USTs discussed later in this paper. Pollution by petrochemicals (or any substance for that matter) is best prevented, as opposed to cured, and where it cannot be prevented, those responsible for the pollution should bear the costs of remediation.

3.3.3 The National Environmental Management: Waste Act 59 of 2008

The Waste Act is primarily administered by the DEA (with the DWA being responsible for certain compliance and enforcement measures)[141] and includes as its objectives the "…reform of the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation…"[142]

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[136] Supra note 113 at 20-24.
[137] Ibid.
[138] S2(4)(p) of NEMA.
[139] S2(4)(ii) of NEMA.
[140] S2(4)(vii) of NEMA.
[141] Supra note113 at 21-38.
[142] Preamble to the Waste Act.

"Waste" is defined according to the Act as "any substance, whether or not that substance can be reduced, re-used, recycled and recovered—
(a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of;
(b) which the generator has no further use of for the purposes of production;
(c) that must be treated or disposed of; or
(d) that is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but—
(i) a by-product is not considered waste; and
(ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste.

It is clear that petroleum products stored in USTs for the purposes of resale do not fall within the ambit of this definition and are therefore not subject to the majority of the Act's provisions which deal with, inter alia, national waste management strategy, waste management measures, licencing of waste management activities and waste information. However, it is unclear whether petroleum products that have leaked from USTs *become* waste in terms of the Waste Act. One could argue, for example, that once they have leaked they become "unwanted" or a substance that must be "disposed of" in terms of the above definition.

Whatever the case, such a determination is not necessary for the purposes of this thesis since the only provisions of the Waste Act that are relevant for current purposes are the so-called "Contaminated Land Provisions" contained in Chapter 4, Part 8. These provisions set out processes for dealing with polluted land and thus give substance to another of the Act's aims, which is "…to provide for the remediation of contaminated land…"[143] How the contamination was caused – whether by "waste" as defined in the Act or not – is irrelevant.

"Contaminated" in relation to land is given a broad definition and includes the presence in or under land of a substance or microorganism above its standard level of concentration which does or may adversely affect, directly or indirectly, the quality of the environment.[144] The contamination of land by petroleum products would therefore certainly fall within this definition. The Contaminated Land Provisions did not come into operation with the rest of the Act in July 2009. Instead, their coming into effect was deferred until 2 May 2014,[145] along with the final norms and standards for the remediation of contaminated land and soil quality promulgated in terms of the Act.[146] Nonetheless, the Contaminated Land Provisions apply even if the

[143] Preamble to the Waste Act.
[144] S1 of the Waste Act.
[145] Proclamation 26, Government Gazette 37547 (April 11 2014).
[146] National Norms and Standards for the Remediation of Contaminated Land and Soil

contamination occurred before the commencement of Act; originated on land not assessed for contamination; arose or is likely to have arisen at a different time from the actual activity that caused the contamination; or, arose through the act of a person that resulted in a change to pre-existing contamination.[147]

Among the most significant implications of the provisions are the consequences of identification of contaminated land, the requirements for notification of contamination and the requirements for transfer of contaminated land, all of which will be dealt with more fully in paragraph 4.3 below.

3.3.4 The National Water Act 36 of 1998

The National Water Act[148] is administered by the Department of Water Affairs ("the DWA") and proclaims the national government's authority over and responsibility for the nation's water resources and aims "…to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled"[149] in such a way as to "achieve the sustainable use of water for the benefit of all users."[150] Moreover, the Act recognises that "…the protection of the *quality* [own emphasis] of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users."[151]

Thus, in order to achieve the goal of sustainable use of the nation's water resources, it is not only the quantity, but also the quality, of the water that must be safeguarded. Pollution is an obvious factor leading to the degradation of potable water resources and the Constitution and the National Water Act are explicit when it comes to the duty of government to provide water to people regardless of who may have polluted it, as was recently affirmed in *Federation for Sustainable Environment v Minister of Water Affairs.*[152] As such, with so many South Africans reliant on groundwater for their daily needs, government would be well-advised to ensure that this invaluable natural resource is afforded adequate protection from contamination since it ultimately bears responsibility for ensuring access to it – a task which will become increasingly onerous should potable supplies dwindle.

Quality GN 331 Government Gazette 37603 (May 2 2014).
[147] S35 of the Waste Act.
[148] Act 36 of 1998.
[149] Ibid at s2.
[150] Supra note 148 at preamble.
[151] Ibid.
[152] *Federation for Sustainable Environment and Another v Minister of Water Affairs and Others* [2012] ZAGPPHC 170.

Bearing the aforegoing in mind, the Act is punctuated by water quality and pollution prevention provisions and chapter 3, entitled "Protection of Water Resources" deals with pollution prevention and response to emergency incidents. Part 4 of Chapter 3 aims to deal with "…pollution prevention, and in particular the situation where pollution of a water resource occurs or might occur as a result of activities on land."[153] "Pollution" is defined as "…the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it (a) less fit for any beneficial purpose for which it is or may reasonably be expected to be used; or (b) harmful or potentially harmful –(aa) to the welfare, health or safety of human beings; (bb) to any aquatic or non-aquatic organisms (cc) to the resource quality; or (dd) to property"[154] and a "water resource" is defined as "…a watercourse, surface water, estuary, or aquifer…"[155] These definitions are both wide enough to cover the contamination of groundwater (or any other water resource for that matter) by petrochemicals, since such contamination would undoubtedly result in pollution as described in the Act.

Part 4, section 19 provides that an owner of land, a person in control of land or a person who occupies or uses the land on which any activity or process is or was performed or undertaken; or any other situation exists which causes, has caused or is likely to cause pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring.[156] Subsection two provides that the measures referred to in subsection 1 may include, *inter alia*, measures to cease, modify or control any act or process causing the pollution, contain or prevent the movement of pollutants, eliminate the source of the pollution and remedy the effects thereof.[157] Should the responsible person fail to take such measures, the relevant catchment management agency may direct that he/she do so by a certain date, failing which it may undertake such measures itself and recover its costs from the relevant person(s)[158].

This would clearly pertain to owners and operators of USTs, whether new or old, should the use of such USTs be determined to have caused or be causing pollution of water resources.[159] Additionally, service stations and truck stops could and almost certainly should be classified as land on which an activity is performed which is likely to cause pollution of a water resource,

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[153] Supra note 148 at S19.
[154] S 1 (1) (xv).
[155] S1(1) (xxvii).
[156] S 19(1).
[157] S 19(2).
[158] Supra note 148 at ss19(3) and 19(4).
[159] Note that the responsible person is obliged to take reasonable measures regardless of how and when the pollution came about. It has also been submitted by Glazewski that the provision is retrospective, based on an interpretation of a similar provision in NEMA. Supra note 3 at 24-16.

specifically those still using old USTs. The threat of environmental degradation caused by leaks from newer tanks, whilst not completely eliminated, is diminished due to improved tank design and leak detection systems. However, many older generation USTs are not equipped with modern leak detection technology or anti-corrosive coatings and are single-walled, *et al*, and an argument could easily be made for their posing a potential environmental hazard. Experience has also shown that older-generation USTs are highly susceptible to corrosion and resultant leaks and it follows that owners or persons in control of land from which service stations are operated are under an obligation, in terms of this section of the Water Act, to take reasonable preventive measures against such occurrences. Without upgrading, replacing or closing the old tanks, it is submitted that such measures are effectively not being taken (since there is no way to successfully prevent pollution other than to protect the tank against and monitor accurately for leaks) and the owners/operators in question are, as a result, in breach of their statutory obligations.

3.3.4.1 Emergency Incidents

Part 5 of Chapter 3 of the Act deals with the pollution of water resources following an emergency incident.[160] "Incident" is defined as "any incident or accident in which a substance (a) pollutes or has the potential to pollute a water resource; or (b) has, or is likely to have a detrimental effect on a water resource."[161] This is a significantly wider definition of "incident" than that in NEMA and according to Glazewski "applies retrospectively and imposes strict liability on any responsible person, as it is triggered where there is actual pollution, a threat of pollution, or an actual or possible detrimental effect on a watercourse"[162]. However, in *Bareki v Gencor*[163], a contrary view was taken when the court held that the Act did not apply retrospectively. However, the subsequent amendments to NEMA and, specifically, the new section 28(1A) confirm that the duty of care and remediation requirements apply equally to damage that was occasioned prior to the commencement of NEMA (in other words, it can no be argued that liability for environmental damage does not have retrospective application).

"Responsible person" is also given a broad definition, namely "…any person who (i) is responsible for the incident; (ii) owns the substance involved in the incident; or (iii) was in control of the substance involved in the incident at the time of the incident. Glazewski makes the point that this definition is exceedingly wide and illustrates it with an example that can

[160] Supra note 148 at s20.
[161] Supra note 148 at s20(1).
[162] Supra note 3 at 24-21.
[163] *Chief Pule Shadrack VII Bareki NO and Another v Gencor Limited and Others* 2006 (8) BCLR 920 (T).

scarcely be more applicable to this paper, stating that "…a petrol service station…typically has an owner, a lessee, and underground storage tanks containing petrol owned by a fuel supply company. If a leak contaminates the groundwater, the persons potentially liable include the owner, the lessee (being in control of the substance) and the petrol company (being the owner of the substance). A contractor working on the premises could also be included if he was responsible for the incident."[164] Who then, is responsible for taking all reasonable measures to contain and minimise the effects of the incident, undertake clean-up procedures, remedy the effects of the incident or execute directives issued by the catchment management agency (and for bearing the costs thereof) as is required in terms of section 20(4)? The Act refers to "*A* responsible person"[165] (own emphasis) being liable to undertake such actions, which presumably means that all of the responsible persons in a particular incident are liable to take action. However, should only one or a few take action and bear the costs, it is unclear whether their costs are recoverable from the other responsible persons and, if so, whether the costs are to be borne equally between all said persons.

Furthermore, Sections 20(7) and 20(8) provide that if the catchment management agency has been obliged to take steps to remedy the effects of the pollution and now seeks to recover its costs, it may do so from "every responsible person jointly and severally" but, if more than one person is responsible, may apportion liability.[166] However, no guidelines are provided as to how liability should be apportioned in such instances[167] and as is evident from the example above, in the case of a leak from a UST, such an exercise would prove incredibly complex.

3.3.5 The Environmental Conservation Act 73 of 1989

The ECA[168] has now largely been repealed by NEMA (both of which are administered by the DEA), however, certain provisions remain in effect. One such provision is section 31A, which provides that the Minister of Environmental Affairs (or competent authority or government institution) may direct any person who, by act or omission, damages or detrimentally affects the environment to cease such damage causing activity or take such steps as may be deemed fit to eliminate, reduce or prevent the damage or detriment.[169]

"Environment" is given a broad definition and includes "…the aggregate of surrounding objects, conditions and influences that influence the life and habits of man or any other

[164] Supra note 3 at 24-21.
[165] Supra note 147 at s20(4).
[166] Supra note 147 at ss20(7) and 20(8).
[167] Supra note 3 at 24-21.
[168] Supra note 132.
[169] Supra note 131 at S31A.

organism or collection of organisms."[170] Water resources and soil (the two environmental media most likely to be affected by leaking USTs) would therefore clearly fall within this definition.

3.3.6 The Hazardous Substances Act 15 of 1973

The preamble to the Act declares its intention to be, inter alia, "[t]o provide for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature and it is administered by the Department of Health.

The Act divides substances into four distinct groups according to the degree of danger that they pose to human health. In terms of the regulations to the Act, motor spirit (including gasoline or petrol) as well as the volatile organic compounds found in it (the BTEX chemicals mentioned in chapter 2 above, namely Benzene, Toluene, Ethylbenzene and Xylene) are all classified as Group II hazardous substances. The Minister of health may pass regulations pertaining to each group and in some instances, has already done so. For example, regulations have been passed governing the conveyance of hazardous substances by road tanker[171] and the aerial application of agricultural remedies.[172] No regulations pertaining to the safe storage and handling of petrochemicals have yet been passed and it is the crux of this thesis that the legislature pursue the promulgation of such regulations in properly regulating these dangerous substances.

3.4 Major Hazard Installation Regulations No. 22506 of 2001

The Major Hazard Installation ("MHI") regulations[173] were promulgated under section 43 of the Occupational Health and Safety ("OHS") Act[174] by the Department of Labour and address the health and safety of the general public as well as that of the employer and workers.[175]

The definition of an MHI comes from the Act and refers to an installation where, inter alia, "…any substance is produced, used, handled or stored in such a form and quantity that it has the potential to cause a major incident." "Major incident" means an "occurrence of catastrophic proportions, resulting from…activities at a workplace." What exactly constitutes an occurrence

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[170] Supra note 131 at S1.
[171] GN 73 in Government Gazette No 9556, 11 January 1985, as amended.
[172] GN R1951 in Government Gazette No 16880, 22 December 1995.
[173] The Major Hazard Installation Regulations No. 22506 of 2001.
[174] Act 85 of 1993.
[175] Department of Labour *Explanatory Notes on the Major Hazard Installation* Regulations (2005), published online at http://www.labour.gov.za/DOL/documents/useful-documents/occupational-health-and-safety/explanatory-notes-on-the-major-hazard-installation-regulation.

of “catastrophic proportions” is not defined, however, when the outcome of a risk assessment indicates a possibility that the public may be involved in an incident, the incident may be considered as catastrophic.[176] Given the nature and possible consequences of petroleum products leaking from a UST (especially when located within close proximity of a water resource), it is safe to say that most, if not all, USTs should fall within the definition of an MHI and that the regulations should, therefore, apply to them.

Regulation 3 deals with notification and dictates that the relevant authorities must be notified in writing prior to the commencement of installation, or upon conversion or modification, of an MHI. The authorities also had to be informed in writing, within 60 days of the promulgation of the regulations, of an existing MHI. Thereafter, a risk assessment, during which the “probable frequency, magnitude and nature of any major incident which could occur at a [MHI], and the measures required to remove, reduce or control the potential causes of such an incident” must be assessed, must be carried out at least every five years and submitted to the relevant authorities.[177]

Other regulations deal with the necessity to have on-site emergency plans in place at all MHIs and with the reporting of emergency incidents.[178] With regard to closure, the regulations simply stipulate that the chief inspector, relevant provincial director and local government must be informed in writing at least 21 days prior to the installation ceasing to be a MHI.[179] Once again, no circumstances under which an MHI must be compulsorily closed are specified.

According to the MHI regulations, the relevant provincial authorities should have a record of all MHIs, including USTs, within their areas of jurisdiction and should be receiving risk assessments regarding those USTs at least every five years. Although this is a solid step in the right direction, it is submitted that the interval between risk assessments is far too protracted and the requirement to “remove, reduce or control” the potential causes of an incident too general to be truly effective in reducing the incidence of leaks from USTs.

3.5 SABS standards

As mentioned above, in 2010, the South African Bureau of Standards (SABS), in a bid to reduce leakages from USTs and related pipework, developed standards for the installation of

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[176] Department of Labour *Explanatory Notes on the Major Hazard Installation* Regulations (2005), published online at http://www.labour.gov.za/DOL/documents/useful-documents/occupational-health-and-safety/explanatory-notes-on-the-major-hazard-installation-regulation.
[177] Supra note 173, regulation 5.
[178] Supra note 172, regulations 6 and 7.
[179] Supra note 172, regulation 10.

USTs at service stations and consumer installations of an individual capacity of less than 85 000 litres. SANS Code 10089 Part 3: "The installation, modification, and decommissioning of underground storage tanks, pumps/dispensers and pipework at service stations and consumer installations" incorporates a number of features designed to minimise leakages/spillages, including general installation standards intended to minimise the potential for damage to the tank and pipework, the installation of observation wells[180] to facilitate monitoring and detection of leaks and the requirement that each tank be fitted with an overfill protection system or device.[181] However, save for clause 12, according to which "a full system integrity test in accordance with an approved test method shall be carried out on the tank after installation", there are no mandatory requirements for integrity testing, leak detection or monitoring or either old or new installations.

Interestingly, according to clause 4.2.1, "[e]ach contractor or installer shall be in possession of an approved detailed pump and tank installation plan before excavation of the site starts..." The clause goes on to note, however, that "[a]n approved plan is *not* required for general maintenance, visual improvement, environmental management improvement, equipment replacement, or emergency work to existing service stations" (own italics).

Several other SABS codes have also been developed in an attempt to ensure that corrosion of tanks is avoided and leaks prevented but, again, these do not contain any provisions regarding monitoring or detecting leaks. These codes include SABS 1535: "glass-reinforced polyester-coated (GRP) steel tanks for the underground storage of hydrocarbons and oxygenated solvents and intended for burial horizontally" which provides for the coating of tanks with the aforementioned GRP coating (all tanks installed since 1993 are supposed to have complied with this code); and SABS 1830: "flexible piping for underground use at service stations and consumer installations." The use of flexible piping reduces the potential for leakage. According to SAPIA, "[t]he standard application of these two codes of practice at all new installations has now removed the risk of corrosion-induced leakage at service stations."[182]

Whether or not this is entirely true, the problem is once again that the codes (like the NEMA EIA regulations) pertain only to *new* tanks and pipework and in this regard, it is notable that SAPIA's assertion that the risk of corrosion-induced leakage has been eradicated is made only in relation to *new* installations.

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[180] Clause 5.1.2 of SANS Code 10089 Part 3.
[181] Clause 11 of SANS Code 10089 Part 3.
[182] Supra note 7.

3.6 Additional Measures

The Petroleum Industry Engineering & Environment Committee ("the PIEEC") comprises representatives from BP, Chevron, Engen, PetroSA, Sasol, Shell, Transnet Pipelines and Total[183] and was established with a view to harmonising efforts by the oil companies to minimise their environmental impacts at service stations and elsewhere. Individual companies are constantly testing various additional measures to eliminate the occurrence of accidental releases at their service stations and the PIEEC has served to collate the feedback received from these companies and formulate draft protocols which, if approved, are then adopted as industry standards by all its members.[184] Examples include the practice of making the service station operator liable for implementing effective stock control practices in terms of his contract with the oil company, the use of automatic tank gauging and the use of double-walled tanks. However, once again, these measures are not mandatory.

So what is the government and industry doing to prevent leaks from older installations? The pamphlet produced by SAPIA titled "*Oil Industry Approach to Leak Prevention and Impact Minimisation at Service Stations"* claims that "[t]he likelihood of leaks resulting from corrosion of storage tanks and pipework at new facilities has now been eliminated by the introduction of…installation standards. However, a number of earlier installations still incorporate tanks and pipework made of older generation materials that are susceptible to corrosion. As it is not financially feasible to replace all of these installations at one time, the Oil Industry has introduced a phased approach to tackle this issue." This approach included conducting a study to identify groundwater resources vulnerable to hydrocarbon contamination in collaboration with the Department of Water Affairs and the Water Research Commission, and developing a numerical Susceptibility Matrix prioritising these resources according to their susceptibility.[185] Service stations situated in the most susceptible areas are then tested for corrosion-inducing qualities (for example, undesirable soil pH levels), which allows for the determination of a "failure prediction index", which in turns indicates the potential for leakages at any given site as a result of corrosion.[186] According to SAPIA, various methods may then employed to reduce the risk of leaks at high risk sites, including the replacement of tanks or testing of their structural integrity, the installation of cathodic protection systems or intensive monitoring.[187]

The development of a "susceptibility matrix" and a "failure prediction index" may seem impressive, but is it all just smoke and mirrors? It is conceded by SAPIA that installations that

[183] Ibid.
[184] Ibid.
[185] Ibid.
[186] Ibid.
[187] Ibid.

are still in use and made of "older generation materials" are susceptible to corrosion and leaks and yet the contention is that, because it is not "financially feasible" to replace all of these tanks at one time, the industry has opted instead to establish which sites are the *most* vulnerable of all the vulnerable sites and then to *possibly* institute certain preventive measures at those sites, which may or may not include replacement of the admittedly outdated and leak-prone tanks. Not only would this process no-doubt have taken quite some time (leaving old, rusting tanks to degrade even further), but the assertion that the replacement of old tanks by the various industry giants who own them is not financially feasible seems laughable. Shell's sustainability report of 2012 proudly declares that it has "clear requirements…to prevent operational spills and multi-billion dollar programmes in place to maintain and improve [its] facilities."[188] The outlandish wealth associated with the oil giants is well known and it seems incongruous that such a prosperous industry, outwardly so committed to sustainable growth and development, would claim that the replacement of notorious and easily-identifiable environmental hazards was unattainable.

3.7 Conclusion

Although South Africa now has a comprehensive and sophisticated environmental legislative framework and a plethora of statutory law seeking to control pollution, all of which is further reinforced by common law principles such as the general duty of care not to cause environmental harm and the polluter pays principle,[189] it is disappointing that, as is often the case in South Africa, enforcement is weak and legislated and common law provisions remain in large part on bookshelves. Fanus Fourie, DWA hydrogeological resource analyst, has been quoted as saying that "…the National Water Act provides a powerful set of regulatory tools with which to manage groundwater and regulate its use. The challenge is one of implementation."[190]

In addition, the fragmented nature of the body of laws, guidelines and environmental and waste management principles informing them applicable to owners and operators of USTs specifically also causes problems in relation to compliance. Whilst ignorance of the law is no excuse for non-compliance, it becomes increasingly difficult for the governed to abide by the law if it is disjointed and spread across a multitude of acts and other legislative and non-

[188] Royal Dutch Shell PLC Sustainability Report (2012) at 33.
[189] Supra note 3 at 20-3.
[190] Smit, P *Groundwater to play a key role in South Africa – WRC* (2011) available online at http://www.engineeringnews.co.za/article/groundwater-to-play-a-key-role-in-south-africa---wrc-2011-03-22, accessed 2 October 2013.

legislative instruments, as opposed to being contained in one comprehensive document that is easily referenced.

Finally, while the abovementioned vast body of law applies to pollution control in general (with some law more specifically geared toward preventing contamination of water resources – a particular concern in the case of leaking USTs and therefore more specifically applicable to the current focus of this paper), dealing with topics such as “emergency incidents” and “prevention of pollution” in general, there is no legislation dealing specifically or exclusively with USTs and the associated concerns and appropriate responses to incidents of that specific nature.

As such, the South African environmental legislative landscape could be drastically transformed and stand to benefit from drawing on the US example and drafting industry-specific regulations governing USTs covering everything from the design and construction of tanks to the installation, monitoring and decommissioning thereof, as well as the prevention, detection and cleanup of spills. A special focus would also have to be given to certain immediately actionable requirements, for example, the replacement or upgrade of old generation USTs and the initiation of some form of leak detection on all tanks. The essential elements of such regulations are discussed in chapter 5.

Various governmental departments would have to be involved in the drafting of such regulations, such as the DEA, the DWA (as custodian of all water resources, including groundwater – which is likely to be most affected by leaking USTs), the department of health and perhaps even the department of labour (although to a lesser extent). Extensive consultation would need to be had with various industry authorities such as SAPIA and the PIECC in order to draw on their expertise and extensive industry knowledge. This is taken up more fully in Chapter 5.

In an ideal scenario, a regulatory authority similar to the United States’ OUST should also be established. However, unlike the United States, where resources are far less limited, South Africa would have to take a more indirect approach to achieving compliance. Assistance, incentives, self-regulation and co-management would be key drivers of success in any programme initiated. Tools available to assist local government in accomplishing and sustaining environmental compliance would include offering guidance (for instance, workshops on how to complete necessary documentation and mentorship/training programmes for inspectors), the dissemination of compliance-inducing information (for example, on matters such as the causes of leaking USTs and potential environmental and health risks and how these can be avoided) and the provision of assistance in the form of

checklists and/or compliance guides. Record-keeping and reporting should also be strictly enforced from the bottom up – with the regulatory authority responsible for USTs bearing the ultimate responsibility for reporting to government on the status of USTs on an annual basis, thus establishing a nationwide database.

In sum, stricter regulation coupled with increased guidance and support, especially to smaller operations in order to ensure their investment in the scheme on the same level as the larger players, is ultimately what is required. Whilst the socio-economic and resource limitations of the country are understood, a more self-regulatory approach could alleviate the burden on the State to implement and manage the scheme. As once eloquently put, "[i]ntergenerational problems arise due to the fact that present actions determine the economic and ecological capacity that the future will inherit"[191] and our present actions (or lack thereof), will determine that our children inherit a particularly grim future unless drastic action is taken against this silent threat, and soon.

[191] Padilla, E *Intergenerational Equity and Sustainability* (2002) Ecological Economics 41, 69–83.

CHAPTER 4

4. LIABILITY IN TERMS OF THE SOUTH AFRICAN REGIME

This chapter outlines the remedies available to an individual or entity injured by a leak from a UST in South Africa. The persons bearing liability for damage caused, the extent and nature of such liability as well as whether any public funds are available to pay the costs in the event that the owner/operator of the UST cannot be found or is unable to compensate the aggrieved party will also be considered.

It is concluded that there are often no real remedies available to injured parties due to a lack of insurance requirements and difficulties faced by plaintiffs in demonstrating all the elements required to prove the validity of their claims. NEMA may provide some relief in this regard, as will be discussed below, however, there is undoubtedly room for improvement in terms of ensuring that the public does not suffer as a result of the failure to foresee potential harm caused by leaking USTs by owners/operators and government.

4.1 The Constitution

In *Hichange Investments (Pty) Ltd v Cape Produce Company (Pty) Ltd t/a Pelts Products and Others,*[192] Leach J considered the meaning of "significant pollution" in the context of subsection 28(1) of NEMA and concluded that "…the threshold level of significance will not be particularly high"[193] and furthermore that "significant pollution" must be considered in the light of the constitutional right to an environment that is not harmful to health and well-being.[194] As such, the s24 environmental right creates a corresponding duty to prevent the environment from becoming harmful to an individual's health or well-being and to prevent significant pollution from occurring, where "significant" is given a very broad scope – the s24 right therefore brings into the ambit of what is considered wrongful conduct even incidents causing relatively minor environmental harm. It has also been convincingly argued to be of both vertical as well as horizontal application, meaning that it is capable of being invoked between private individuals.[195] This would mean that, in theory, those affected by contamination caused by leaking USTs would have recourse not only to government, but also to individual fuel retailers and petroleum companies for an infringement of their constitutional rights.

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[192] 2004 (2) SA 393 (E).
[193] Ibid at 414I – 415A.
[194] Supra note 3 at para 5.2.8.2.
[195] Supra note 3 at 20-5.

However, the environmental right has yet to be tested in South African courts and although there can be no doubt that the contamination of underground water supplies and soil by hazardous substances such as petrochemicals constitutes an infringement of the right to an environment that is not harmful to one's health or well-being (with "well-being" having been given a broad definition by the courts to include even living in an "environment of stench"[196]), successfully bringing a claim in court could prove to be difficult. Nonetheless, the right and corresponding duty and liability exists in our law and is capable of wide application.

4.2 The common law

4.2.1 Delictual liability

As mentioned above in chapter 3, the essence of the law of delict is that any defendant who has wrongfully caused harm to the person or property of another through an intentional or negligent act or omission, is liable to that person for the damage suffered as a result thereof.[197] Quantifying environmental harm suffered in pecuniary terms is always perplexing since the environment is not owned by anyone in particular and so, in general, plaintiffs will rely on the costs of repair and rehabilitation.[198] Whilst the damage to the environment as such is not recoverable, insofar as such damage has resulted in harm to a person, it is recoverable.[199] The general rule in delictual actions is that plaintiffs will be awarded damages for patrimonial loss (monetary loss associated with property rights), but not for non-patrimonial loss (harm associated with personality rights). Thus, a claim could be made for damage to property, medical expenses and pain and suffering in terms of a delictual action, but not for any injury to a person's feelings or for discomfort or inconvenience caused.[200] Both direct and consequential patrimonial damages are claimable[201] and claims for pure economic loss (as opposed to damage to property) and prospective loss (for example, if the pollution may potentially result in the reduction in value of a property in the future) may also be instituted.[202] In relation to the amount of damages that may be claimed, the plaintiff should be placed in the position he would have been in had the delict never occurred – the courts will access the cost of doing so and make an award in those terms.[203]

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[196] *Hichange Investments (Pty) Ltd v Cape Produce Company (Pty) Ltd t/a Pelts Products and Others* 2004 (2) SA 393 E.
[197] Supra note 3 at 20-7.
[198] Ibid at 20-15.
[199] Ibid.
[200] Ibid.
[201] Ibid at 20-16.
[202] Ibid.
[203] Ibid at 20-15.

Clearly, there are a number of hurdles that a plaintiff seeking redress through an aquilian action must overcome in order to be successful in his suit. Not only must all five elements of a delictual claim be proven (as elaborated upon above in chapter 3), the demonstration and quantification of damages alone can be a massive undertaking, after which the plaintiff may be awarded substantially less than the harm actually incurred. It is, as such, a remedy which is particularly burdensome on the plaintiff, the pursuit of which requires a large investment of time (and possibly money) on the part of the injured party.

4.2.2 Law of neighbours and nuisance law

As mentioned in chapter 3, neighbour law and the law of nuisance are both relevant in relation to pollution caused by leaking USTs and provide some relief to those aggrieved by the consequences thereof.

The remedy typically associated with the laws of nuisance and neighbours is an interdict ordering the offender to refrain from the commission of nuisance-causing behaviour or from continuing such existing behaviour.[204] The law of nuisance has successfully be invoked in, for example, obtaining an interdict preventing contaminated water from being allowed to flow over a railway line that it was causing damage to.[205] Obtaining an interdict does not generally require proving fault on the part of the respondent unless the prayer for an interdict is accompanied by a claim for damages, which is the alternative remedy available in circumstances of nuisance.[206] However, there is uncertainty as to whether such claims for damages caused by a nuisance or unreasonable interference from a neighbour requires proof of fault in the form of either negligence or intention.[207] As such, a common law claim for damages suffered as a result of a nuisance is better instituted in terms of the law of delict, more fully discussed in paragraph 3.2 above.

4.3 The Waste Act

As mentioned in paragraph 3.3.3 above, the important consequences in terms of liability of the Contaminated Land Provisions of the Waste Act include requirements for notification of contamination, the consequences of identification of investigation areas by the Minister; and the transfer of contaminated land. Each of these will be dealt with separately below.

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[204] Ibid at 20-23.
[205] *Colonial Government v Mowbray Municipality and Others (1901) 18 SC 453*, cited in Glazewski (supra note 3) at 24-9.
[206] Supra note 3 at 20-21 and 20-23.
[207] There is some debate as to whether nuisance is a special category of Aquilian liability where fault may be dispensed with in certain instances or whether nuisance, as a separate feature of the common, generally does not require fault to be shown (supra note 3 at 20-20).

4.3.1 Notification of contamination

The Contaminated Land Provisions require an owner of land that is significantly contaminated, or a party that undertook an activity that caused the land to be significantly contaminated, to notify the relevant authority of the contamination as soon as that party becomes aware of it.[208]

It is an offence in terms of the Act to fail to comply with or contravene section 36(5)[209], and doing so may result in either a fine of up to R5 million or imprisonment for up to five years, or both, in addition to any other penalty or award that may be imposed or made in terms of the NEMA.[210] While there is no positive obligation upon the persons mentioned in section 36(5) to determine whether or not a site is contaminated, this lack of a positive duty would not constitute a defence if the contamination was deemed to be an obvious consequence of the activities undertaken at the site.[211] Thus, although the Contaminated Land Provisions are similar to the duty of care provisions in the NEMA and the Water Act, they create a new form of liability analogous to strict liability for landowners and those undertaking potentially polluting activities on land.[212]

4.3.2 Identification of investigation areas

Related to the notification obligation is the obligation on the Minister to keep a national "contaminated land register" of "investigation areas" in terms of section 41 of the Act. Section 36(1) provides that the relevant authority may, after due consultation, identify as investigation areas "…land on which high-risk activities have taken place or are taking place that are likely to result in land contamination; (and/or), land that the Minister or MEC … on reasonable grounds believes to be contaminated." A written notice identifying land as an investigation area may then be issued to the responsible person.[213] A "high-risk activity" means an "undertaking, including processes involving substances that present a likelihood of harm to health or the environment."[214] The national contaminated land register must include

[208] Supra note 24 at s36(5).
[209] Supra note 24 at sS67(1)(b).
[210] Supra note 24 at s68(2).
[211] Gilder A and Brand J., The law applicable to contaminated land in South Africa, (2014) Environment Newsflash, accessed online at http://www.ensafrica.com/news/The-law-applicable-to-contaminated-land-in-South-Africa?Id=1411&STitle=environment%20newsflash on 24 June 2014.
[212] Tucker C., *Contaminated land provisions of Waste Act in operation* (2014) Globe Business Publishing Ltd.
[213] Supra note 24 at s36(6).
[214] Supra note 24 at s1.

information on the owners/users of any investigation areas and the status of remediation activities undertaken on them.[215]

Section 37 empowers the Minister or MEC to direct the person who is are has undertaken the high-risk activity or any activity that caused or may have caused the contamination to carry out a site assessment at their own cost. The results of such an assessment must be reported in a Site Assessment Report on the basis of which the investigation area may be deemed contaminated, in which case a remediation order may be issued.[216] The costs of the remediation are to be borne by the person in whose name the order is issued.[217]

4.3.3 Alienation of contaminated land

The Contaminated Land Provisions also apply to the alienation of land, as no person may transfer contaminated land without informing the transferee that the land is contaminated and, in the case of a remediation site, without notifying the relevant authority and complying with any conditions that are specified by it.[218] Should an owner of land fail to comply with these provisions in the event of a transfer of contaminated land, the penalty provisions discussed above that are applicable to non-compliance with section 36(5) would apply.[219]

4.3.4 Waste Act conclusion

Since legislation governing waste management has historically been fragmented in South Africa[220], the Waste Act "emphasises the need for intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment."[221] Unfortunately, for a number of reasons, the Act has not been successful in achieving this aim in relation to the discharge and disposal of waste.[222] Nonetheless, the ideal of a co-ordinated and integrated management system is admirable and central to the recommendations made in this thesis.

Furthermore, critics have long pointed out that the Contaminated Land Provisions in particular are vague, fail to achieve their aims and fall short of what an effective regime should include.[223]

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[215] Supra note 24 at s41(1).
[216] Supra note 24 at s37(b)(ii).
[217] Supra note 211.
[218] Supra note 24 at s40(1).
[219] Supra note 211.
[220] Department of Environmental Affairs, *A user friendly guide to the National Environmental Management: Waste Act, 2008* (2011) Pretoria, South Africa.
[221] Fuggle et al, *Environmental Management in South Africa* (2008) Juta at 735.
[222] Ibid; Sweet J., *Is the Waste Act a waste of effort?* (2011) Without Prejudice at 28.
[223] See for example M Kidd, *Should bad law be remediated? The Contaminated Land Provisions in the National Environmental Management: Waste Act (2009) SAJELP 16, 2* referred to in Tucker C., *Contaminated land provisions of Waste Act in operation* (2014) Globe Business Publishing Ltd.

However, they must now be read in conjunction with the norms and standards published in terms of the Waste Act, the purpose of which is "to provide a uniform national approach to determine the contamination status of an investigation area; limit uncertainties about the most appropriate criteria and method to apply in the assessment of contaminated land; and provide minimum standards for assessing necessary environmental protection measures for remediation activities".[224]

Whilst a uniform national approach, intergovernmental co-ordination, the removal of uncertainties regarding assessment criteria and the introduction of strict notification requirements, *inter alia*, are steps in the right direction in terms of identifying and assessing contaminated land, it is submitted that the Waste Act's provisions are largely aimed at remediation as opposed to prevention and are therefore inadequate in at least that sense. In addition, once again, they are not designed to deal with the peculiarities of petrochemical contamination and are thus lacking in much needed detail.

4.4 The National Water Act

Chapter 16 of the Water Act lists the acts and omissions which constitute offences under the Act, along with the associated penalties.[225] Section 151 states that no person may unlawfully and intentionally or negligently commit any act or omission which pollutes or is likely to pollute, or detrimentally affects or is likely to affect a water resource.[226] Should a person be convicted of such an offence and another person has suffered harm or loss as a result of the act or omission, the court may enquire into the harm, loss or damage, determine the extent thereof[227] and award damages for the loss or harm suffered by the relevant person as well as order the accused to pay for the cost of any remedial measures implemented or to be implemented.[228] There is no limit placed on the quantum of damages or costs that may be awarded by the court, and there are also no restrictions mentioned as to the kind of damages that may be sought.

4.5 The NEMA

The offences listed in section 151 of the National Water Act (mentioned above) relating to the pollution or potential pollution/degradation of water resource, are also listed in Schedule 3 of

[224] S2 National Norms and Standards for the Remediation of Contaminated Land and Soil Quality GN 331 Government Gazette 37603 (2 May 2014).
[225] Chapter 16 of the National Water Act.
[226] S151 (i) and (j).
[227] S152.
[228] S153.

NEMA. Section 34 of NEMA then provides that where a person is convicted of an offence listed in Schedule 3 and the commission of such an offence has resulted in loss or damage to an organ of state or other person, the court may enquire summarily and without pleadings into the amount of the loss or damage suffered.[229] The court may then award damages in favour of the organ of state or other person concerned against the convicted person in the amount proven before the court and "such judgement shall be of the same force and effect and be executable in the same manner as if it had been given in a civil action…"[230]

In addition to the criminal provisions contained in section 34 of NEMA, a statutory duty of care was also introduced in terms of section 28[231], providing some relief to plaintiffs in instances where neither a criminal conviction nor a delictual action are viable options. Section 28 alleviates to some extent the particularly arduous task borne by the plaintiff in a delictual claim of proving fault and causation.[232] However, whether strict liability applies is a question of statutory interpretation[233] and whether plaintiffs claiming a breach of the duty imposed by section 28 will have to show fault (in the form of either negligence or intention) is left to the discretion of the courts. Nonetheless, a claim for damages for breach of this statutory duty is another avenue that aggrieved parties may wish to pursue in seeking redress for harm suffered as a result of a leaking UST.

In addition to the above, the NEMA polluter pays principle, precautionary principle and preventive principle as well as the underlying notion of sustainable development on which these principles are based[234], all place the responsibility for rehabilitation of environmental damage squarely on the shoulders of the polluter in varying degrees. The extent of such responsibility has yet to be delineated and whether it extends to personal damages or only covers the cost of clean-up and damage to property remains to be seen.

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[229] S34(1).
[230] S34(2).
[231] Section 28(1) provides that "[e]very person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment."
[232] Supra note 3 at 20-20.
[233] Ibid.
[234] The NEMA defines sustainable development as "the integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations" in s1(1) (xxix). At its core is the notion that environmental protection should be inextricably integrated into socio-economic development. The NEMA principles build on this by stating that those responsible for environmental degradation should bear the costs of rehabilitation.

4.6 Conclusion

From the above it is evident that the multitude of remedies available to those who have suffered damages as a result of pollution in South Africa, including hydrocarbon pollution resulting from a leaking UST, are diverse and, at times, somewhat difficult to invoke and onerous on the plaintiff. Most notable, however, is the fact that owners/operators of USTs are not required by law to be insured against claims arising out of contamination incidents which can run into millions of Rands (although in practice many owners/operators may in fact be obliged to take out insurance as a condition of their contracts with the oil companies that they represent), leaving plaintiffs in such cases exposed to the risk that their claims will not be satisfied since those responsible lack the requisite financial resources to do so.

By contrast, plaintiffs in the US are in a substantially better position - albeit not a completely protected one. Although the LUST Trust Fund is used to pay for clean-ups in instances where the owner is unknown, unwilling or unable to respond, as mentioned above, clean-up costs covered by the fund include only the actual cost of the clean-up, temporary or permanent relocation of residents, alternative household water supplies, and any exposure assessment.[235] Personal claims for injury or damage to property are therefore not covered by the fund. However, the financial responsibility requirements provide that all owners and operators must be insured against potential liability arising from an incident of pollution including personal injury claims or claims for damage to property (in practice these requirements are not always strictly adhered as some States require proof of insurance on a less frequent basis than others, however, in theory, owners/operators should be insured at all times).

[235] United States Environmental Protection Agency *LUST Trust Fund and Cost Recovery* accessed online at http://www2.epa.gov/enforcement/lust-trust-fund-and-cost-recovery on 23 February 2014.

CHAPTER 5

5. CONCLUSION AND RECOMMENDATIONS

5.1 Main Findings

Leaking USTs constitute a problem of national significance due to the insidious nature of the chemicals involved. Exposure to, or ingestion of, petroleum-contaminated water may potentially lead to a variety of ailments, including cancer and even death.[236] Adding to their danger due to toxicity is the fact that petrochemicals are also highly mobile, with one gallon of gasoline able to contaminate the entire groundwater supply of a town of 50,000 residents.[237] With one-third of South-African citizens' being dependant on groundwater for their day-to-day needs, under-regulation of USTs should be taken extremely seriously and viewed as an epidemic that presents an imminent health and environmental hazard to millions of South Africans.

Not only is the installation, monitoring and decommissioning of USTs not adequately regulated in South Africa, but the remedies available to those who suffer injury or harm as a result of a leaking UST are often onerous to institute and undermined by the fact that there are no financial responsibility provisions for owners/operators or a public fund upon which plaintiffs can rely should owners be unable to satisfy claims. Additionally, it is difficult to pin-point which government agency is responsible due to the various pieces of applicable legislation and numerous government departments and agencies involved in the administration thereof.

It is submitted that what is required is the establishment of a dedicated regulatory authority as well as technical regulations dealing with the prevention (from modern tank design to correct installation methods to proper filling procedures and spill prevention techniques), detection (i.e. modern leak detection systems), response to and cleaning up of releases and decommissioning of USTs. Regulations dealing with the financial responsibility of owners and operators and compliance and enforcement are also a must. The regulations would be suitably enacted in terms of the NEM: Waste Act, which has as one of its aims "to provide for national norms and standards for regulating the management of waste by all spheres of government."[238]

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[236] Chanin J., *LUST on Your Corner: Strict Liability, Victim Compensation, and Leaking Underground Storage Tanks*, 62 U. Colo. L. Rev. 365, 371-72 (1991) (citing New Jersey Dep't of Health, Hazardous Substance Fact Sheet for Gasoline (1985)).
[237] Basile J., *Still No Remedy After All These Years: Plugging the Hole in the Law of Leaking Underground Storage Tanks* (1998) Indiana Law Journal: Vol. 73: Iss. 2, Article 16.
[238] Prelude to the Waste Act.

The public should also be made aware of the liability of individual fuel station owners and the horizontal application of the s24 right to an environment that is not harmful to one's health or well-being. If people are aware of their rights, dilemmas such as the one Beaufort West is currently facing will not continue for so many years without being reported to the authorities or any substantial action being taken in mitigation of the pollution.

5.2 Specific recommendations

What follows is a list of recommendations based on research conducted and the critical analysis between the US and South African approach to regulating USTs for how the South African legislature can improve upon current regulation in this area.

1. Drawing on the US example, industry-specific national regulations should be drafted and should cover all necessary aspects of UST-related safety, including design and construction of tanks and piping, installation, monitoring and decommissioning of tanks, and prevention, detection and clean-up of leaks and spills. The regulations should be highly detailed and specify the exact procedure to be followed in the event of a release. They should also be revised and updated on a regular basis as best practice improves and evolves, and should be easily downloadable from the internet, making them readily available to all owners and operators of USTs.

2. It is recommended that the regulations should be drafted by the Department of Environmental Affairs who, as the lead agent responsible for the administration of the Waste Act is mandated to prepare regulations, frameworks, policies, and norms and standards for co-ordinated and integrated waste management generally.[239] Whilst petrochemical storage in USTs does not fall within the definition of waste, the Waste Act's focus on creating a uniform national approach to pollution control, facilitating intergovernmental co-ordination and the harmonisation of policies aligns it perfectly with the recommendations made in this thesis. The regulations could thus be drafted in terms of the Contaminated Land Provisions of the Waste Act, which certainly do pertain to contamination of land by petrochemicals leaking from USTs. The Department of Water Affairs (which remains responsible for certain compliance and enforcement measures and is, more importantly, the custodian of all of South Africa's

[239] Supra note 3 at 21-38.

water resources)[240] and the Department of Health (which obviously has an interest in pollution prevention) as well as industry leaders such as SAPIA and the PIEEC should also be consulted during the drafting process. This is important in order to ensure that all relevant role-players and those with the most extensive hands-on knowledge of industry operations and practicalities are included in the determinations as to how the industry is best regulated. To this end, the SABS codes as well as the industry-produced guidelines and recommendations referred to in Chapter 3 should also be incorporated into the regulations insofar as practicable and deemed desirable by the parties in consultation.

3. In terms of the regulations, a dedicated regulatory authority and inspectorate ("the Regulatory Authority"), similar to OUST in the US, should be established to implement the regulations and ensure compliance therewith. This regulatory authority should comprise members of the DEA only, notwithstanding the fact that the DWA is currently responsible for certain elements of compliance and enforcement in terms of the Waste Act, to ensure that there is one agency ultimately responsible for pollution of this nature and answerable in situations where it is not adequately or appropriately dealt with – it is submitted that a body comprised of members from various departments is likely to be less accountable and therefore less effective.

4. Since the environment falls within schedule 4 of the Constitution and is therefore an area of concurrent national and provisional legislative competence, the abovementioned national regulations should encourage the provinces to draft and implement their own province-specific regulations to replace the national regulations provided that certain requirements are met and the approval of the Regulatory Authority is obtained. Once these provincial regulations and resulting programs are in place, the department within each provincial department of environmental affairs that deals with waste could be made responsible for the implementation thereof. Like the US state-specific regulations, these provincial regulations and programs will lighten the load on the Regulatory Authority and ensure better and more effective enforcement, as well as raised awareness within each province.

[240] Ibid at 21-38.

5. Since there is currently no accurate, national record of all USTs in the ground at fuel retailer outlets and truck stops, whether in or out of commission, field-based research should be undertaken in order to establish their exact number, location and specifications, as well as the person or entity responsible for each of them. This should form the basis of a national database to be updated and maintained by the Regulatory Authority.

6. The Regulatory Authority should, in collaboration with SAPIA, establish UST installer, owner/operator, service technician and inspector training programmes and best management practices for facilities at which USTs are in use. The training should highlight proper installation methods, operation of leak detection systems and response procedures to suspected and confirmed releases or spills - it being imperative that contaminated sites be cleaned up as soon as possible after a release has occurred since, as mentioned, petrochemicals can pollute groundwater and may also result in fire and explosion hazards, as well as lead to long-term health effects in those affected by the contaminants. Furthermore, it should be required by law that UST facility owner/operators, service technicians, installation and removal contractors, and inspectors meet minimum industry-established training standards and that facilities be operated in a manner consistent with industry established best management practices.

7. Notification procedures should be introduced insofar as the installation or upgrade of tanks is concerned, and stringent record-keeping requirements applicable to all owners/operators should be established in terms of which any and all monitoring activities and inspections should be documented, as well as any leaks or spills that may have occurred and the response measures taken, any reported damage and related repairs to tanks, and any other noteworthy incidents. The above-mentioned regulations should thus include provisions aimed at reducing incidences of fraud and false reporting by such owners/operators and inspection, maintenance, and service/repair companies.

8. Similarly to point 5, record-keeping and reporting by the Regulatory Authority should be implemented, with annual reports being submitted to government and industry containing information on any releases and all measures undertaken in response thereto.

9. Financial responsibility provisions for owners/operators of UST facilities similar to those in the US should be implemented in South Africa to ensure that in the event of a

contaminating incident, owners/operators have the financial resources available to cover the costs associated with the rehabilitation of the affected environment and to compensate third parties for any damages they may have suffered. The nature of the damages and any limitations in the quantum claimable should be carefully considered and explicitly set out in the regulations. The Regulatory Authority should require proof of insurance be filed with them on an annual basis, so as to minimise instance of owners/operators defaulting on their payments or cancelling their insurance.

10. A public fund derived from a percentage-per-litre motor fuels tax similar to the LUST Trust Fund should be established in South Africa in order to cover clean-up costs in instances where those responsible for the contamination cannot be found or are for some reason incapable of covering the costs themselves (for example, due to having defaulted on their insurance payments).

11. The duty of care provisions in the NEMA and the Water Act as well as the penalty provisions in the Contaminated Land Provisions of the Waste Act should be incorporated by reference into the regulations, as well as specific new penalty provisions aimed at the prevention of contamination. However, in addition, compliance and enforcement measures similar to those in the US should also be introduced i.e. assistance, self-regulation and incentives should be emphasised since South Africa does not have the resources that the US has to ensure compliance. More guidance is also required in order to ensure that the smaller operations invest as heavily as the larger players in remaining compliant. Resources available to assist the regulatory body and local governments achieve and sustain compliance include providing training, compliance checklists, compliance guides, tutorials on how to complete necessary documentation and mentoring programmes to those responsible for ensuring that a particular operation is in compliance with the laws.

12. Industry codes and standards should also be encouraged and developed, although this may take some time given the fact that they would have to be based on the regulations. Industry standards are a useful tool for adding to and fleshing out regulations in order to form a complete and comprehensive regulatory regime. SAPIA would be well positioned to oversee the development of such standards.

13. A campaign to disseminate information to the public and specifically to owners/operators of UST facilities should be undertaken and overseen by the Regulatory Authority in collaboration with industry leaders. The comparison between

the amount of information and assistance available to owners/operators in the US and in South Africa is alarming - whereas almost every state in the US has a website or part of a website dedicated to providing critical information to the public about the history of leaking USTs and potential health and environmental risks and how these can be avoided[241], there is no such South African equivalent. In addition, the EPA also has its own site dedicated to the distribution of information pertaining to leaking USTs, their regulation and how to become and remain compliant with all the relevant regulations (in the case of owners/operators).

Responsible Packaging Management Association of South Africa president Liz Anderson has been quoted as saying that "[w]hile there is a drive from industries to become more eco- friendly, many small companies are not aware of the current environmental regulations…which require an environmental-impact assessment to be undertaken before the installation of a storage tank aboveground or underground…Ignorance of the law is not an excuse, but, unfortunately, there are those who do not have sufficient information to be compliant with the law."[242] The Regulatory Authority may also consider implementing a campaign to educate small business owners/operators on the importance of adhering to the regulations, industry norms and standards and training requirements, as well as where all the information relevant to compliance can be found.

14. Once the above has been achieved, research aimed at identifying any deficiencies in tank technology, leak detection systems or methods of preventing minor surface spills from non-UST related activities should be undertaken. The research should be overseen by the Regulatory Authority and funded by government and industry cooperatively. The results should be used by the Regulatory Authority and industry to develop suitable changes to the UST standards and guidelines established on design, construction, operation, monitoring and maintenance of present and future UST systems.

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[241] See, for example, the Indiana Department of Environmental Management's page on leaking USTs at http://www.in.gov/idem/5067.htm, the California Environmental Protection Agency's page at http://www.swrcb.ca.gov/ust/ and the New Hampshire Department of Environmental Services page at http://des.nh.gov/organization/divisions/waste/orcb/ocs/ustp/.

[242] Hancock T., *Act Requires EIA for storage tank installation* (30 July 2010), available online at http://www.engineeringnews.co.za/article/small-companies-unaware-of-regulations-2010-07-30, accessd on 12 June 2013.

15. Any new fuel additives that may pose a significant environmental risk should be tested for compatibility with USTs and related pipework before being introduced to the market. Once again, ensuring that this is done is a process that should be overseen by the Regulatory Authority.

The aforegoing represents a wish-list of the legal mechanisms and governance to be put in place in order to ensure maximum regulatory certainty and compliance in this specialised field, however, given South Africa's limited resources, one cannot perceive a scenario in which implementation-related hurdles will not be faced. However, without setting clear and certain goals towards which to aspire, there will never be any steps taken to achieve them.

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