# LLM ENVIRONMENTAL LAW

**Dissertation**

## Regulating contaminated land in order to identify, manage and cause the rehabilitation of contaminated land: *A review of the legislative adequacy of South Africa's contaminated land regime*

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Research dissertation presented for the approval of Senate in fulfillment of part of the requirements for the LL.M. (Environmental Law) in approved courses and a minor dissertation. The other part of the requirement for this qualification was the completion of a programme of courses.

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**ABSTRACT**

Land contamination remains a chronic threat to environmental integrity and human health, warranting scrutiny on the effectiveness of the domestic legal regime. South Africa has still to understand the full extent to which it will undermine the country's sustainable development goals and well-being of its population. Contaminated land impacts not only the environment, but it causes socio-economic impacts.

In 2009, the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) was enacted with a dedicated contaminated land regime (Part 8 of that Act). Given the importance of regulating contaminated land, a valuable analysis would be to determine whether Part 8 is legislatively adequately to enable the identification, management and rehabilitation of contaminated land.

There is, however, a serious lack of information about the extent of land contamination in South Africa. This is evident from its the government's official reporting. There is also little information about the enforcement of the contaminated land regime itself and it is therefore difficult to measure its success.

International studies have identified certain legislative best-practice elements for contaminated land regimes. These elements present a good yardstick against which to measure Part 8 of the Waste Act for purposes of determining whether it will enable the identification, management and rehabilitation of contaminated land.

This study finds that while Part 8 contains some of the legislative best practices, it mostly falls short and various reforms are recommended.

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Abbreviations

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| **CSIR** | Council for Scientific and Industrial Research |
| **DEFF** | The national Department of Environment, Forestry and Fisheries |
| **NECER** | National Environmental Compliance and Enforcement Report |
| **USA** | United States of America |
| **CERCLA** | USA's Comprehensive Environmental Response, Compensation, and Liability Act |
| **IUCN** | The International Union for Conservation of Nature |
| **NWMS** | National Waste Management Strategy |
| **CCICED** | Chinese Council for International Cooperation on Environment & Development |
| **USA** | The United States of America |
| **NEMA** | National Environmental Management Act, 1998 (Act No. 107 of 1998) |
| **ECA** | Environment Conservation Act, 1989 (Act No. 73 of 1989) |
| **Part 8 Norms and Standards** | National Norms and Standards for the Remediation of Contaminated Land and Soil Quality |
| **Part 8** | Part 8 of the Waste Act |
| **NEMLA Bill** | National Environmental Management Laws Amendment Bill (Bill B14D of 2017) |
| **monitoring and management order** | an order issued by the Minister or MEC in terms of section 38(2) of the Waste Act |

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| **remediation order** | an order issued by the Minister or MEC in terms of section 38(3) of the Waste Act |
| **Water Act** | National Water Act, 1998 (Act No. 36 of 1998) |
| **PAJA** | Promotion of Administrative Justice Act, 2000 (Act No. 3 of 2000) |
| **Framework for Contaminated Land** | DEFF, Framework for the Management of Contaminated Land, May 2010 |
| **UK** | The United Kingdom of Great Britain and Northern Ireland |
| **PRP** | Potentially responsible person |
| **IP&WM White Paper** | White Paper on Integrated Pollution and Land Management |
| **Section 37(1) Directive** | A directive in terms of section 37(1)(b) of the Waste Act |

# 1. Introduction

## 1.1 Background

Land contamination remains a chronic, important, and high-level threat to environmental integrity and human health, warranting scrutiny on the effectiveness of the domestic legal regime. South Africa is still grappling to understand the full extent to which it will undermine the country's sustainable development goals[1] and health and well-being of its population.[2] This is particularly important because the impact of contaminated land is not always immediate. The effects of contaminated land is known to manifest itself slowly, while not always being visible and can span decades.[3]

The contamination of land has numerous, significant associated adverse impacts and the proper regulation thereof cannot be overemphasised. Land plays an integral part in the regulation of natural and socio-economic processes that are necessary for human survival, such as the water cycle and the climate system.[4] The importance of conserving land is vital. This is because soil is responsible for performing numerous functions which is integral to human and animal life.[5] Land provides food, raw materials and serves as the basis on which we build our homes and more broadly, our economies. Land also performs storing, filtering and transformation functions, as well as social and cultural functions.[6] It is therefore critical to have a legislative framework in place to support efforts to conserve and remediate contaminated land.

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[1] South Africa's sustainable development goals are recorded at http://www.za.undp.org/content/south_africa/en/home/sustainable-development-goals.html. [Accessed on 4 July 2019.]

[2] WWF-SA, South Africa, *The Food Energy Water Nexus: Understanding South Africa's most urgent sustainability challenge* (2014). Available at http://www.fewlbnexus.uct.ac.za/nexus-publications. [Accessed on 1 August 2019.].

[3] European Commission DG Environment, (2013), "In-depth Report - Soil Contamination: Impacts on Human Health*", Science for Environment Policy In-depth Report*. Available at http://ec.europa.eu/science-environment-policy. [Access on 1 November 2018.], at pages 4 and 10.

[4] Görlach B et al, (2004), "Assessing the Economic Impacts of Soil Degradation. Volume IV: Executive Summary". European Commission, DG Environment, Study Contract ENV.B.1/ETU/2003/0024, at page 4.

[5] Görlach et al "Assessing the Economic Impacts" at page 4.

[6] Görlach et al "Assessing the Economic Impacts" at page 4.

Contaminated land has the potential to not only cause significant environmental harm to different elements of the environment such as water resources,[7] agricultural food production,[8] and eco-systems,[9] but it also has the potential to cause adverse social[10] and economic effects.[11] Studies have shown land contamination to cause serious social impacts such as an increase in divorce rates in communities situated in contaminated areas, depression and anxiety caused by concern for the future.[12] It is therefore not difficult to conclude that contaminated land negatively affects the general health, well-being and lives of human beings.

Historically, in South Africa, the legal regime governing contaminated land was fragmented in that it spanned more than one law as well as more than one governmental-administrative body. Furthermore, the regime under the Environment Conservation Act ("ECA")[13] and the National Water Act ("NWA")[14] was not dedicated to addressing contaminated land. Rather, it was actually, as its end goal, dedicated to regulating dump sites, and protecting water resources, respectively. Because of this, the provisions which made up these laws were broadly framed, could not fit into a contaminated-land factual scenario easily and as a result, is largely ineffectual.[15]

In March 2009, the National Environmental Management: Waste Act[16] ("Waste Act") was promulgated. Part 8 of the Waste Act, which deals with contaminated land, only came

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[7] CSIR, (2010), "A CSIR Perspective on water in South Africa". Available at www.csir.co.za/nre/docs/CSIR%20Perspective%20on%20Water_2010.PDF [Accessed on 20 March 2011.].

[8] Dudka S et al (1996), "Transfer of cadmium, lead, and zinc from industrially contaminated soil to crop plants: A field study", *Environmental Pollution*, Volume 94, Issue 2 at page 181; European Commission DG Environment, "Soil Contamination*",* at page 7.

[9] Dudgeon et al (2006), "Freshwater biodiversity: Importance, threats, status and conservation challenges"*, Biological Review*s, Issue 81, Volume 2 at page 163.

[10] Barnes et al, (2005), "The social impact of land contamination: reflections on the development of a community advocacy and counselling service following the Weston village incident", *Journal of Public Health*, Volume 27 No. 3 at page 276*.*

[11] Görlach et al "Assessing the Economic Impacts" at page 4.

[12] Barnes et al (2005) *The Journal of Public Health.*

[13] Act No. 73 of 1989.

[14] Act No. 36 of 1998.

[15] ECA only sought to control littering (section 19), waste dump sites (section 20) and gave the Minister the power to identify specific activities which required authorisation (section 21), but there was not general objective to deal with the effects of contaminated land. DEFF agrees with this view at page 59 of the NWMS.

[16] Act No. 59 of 2008.

into operation on 2 May 2014, heralding a change in approach in the management of contaminated land in the country.[17] The National Norms and Standards for the Remediation of Contaminated Land and Soil Quality[18] ("Part 8 Norms and Standards") was published on the same date that Part 8 came into effect to support its implementation.[19] The government of South Africa has therefore sought to deal directly with contaminated land. The question remains, after the passage of more than 10 years after the enactment of the Waste Act, of whether it creates an enabling legislative platform to tackle the issue successfully.

### 1.2 Research Rationale

It has been more than five years since the promulgation of Part 8 of the Waste Act and the Part 8 Norms and Standards and a decade since the Act's enactment. Given the time which has passed, concerns arise about the implementation of Part 8 given the lack of information garnered under Part 8 to assess the status of contaminated land in South Africa. Apart from a very good analysis by Kidd,[20] little has been written in South Africa on the topic suggesting that it may be useful to expand upon the body of literature on this issue. There is currently no substantive national and even regional data about the extent to which South Africa's land is contaminated by industrial and ordinary urban activities. DEFF's view is that there is a paucity of information of the extent of the problem. This is confirmed in the 2nd South Africa Environment Outlook Report,[21] which states that "[l]*and contamination results in a decrease in soil productivity…Inadequate data is available to determine performance, but it seems to be deteriorating*".[22]

There may be many reasons for the lack of information, but questions arise regarding the adequacy of the regime's provisions in light of the lack of enforcement notices

[17] By Proclamation 26 of 2014 in Government Gazette 37547 dated 11 April 2014.
[18] In Government Notice No. 331 of Government Gazette 37603 dated 2 May 2014.
[19] Section 3 of the Part 8 Norms and Standards states that "[t]he requirements set out in these norms and standards apply to an owner of land or any person who undertakes site assessment and remediation activity in terms of the Waste Act."
[20] Kidd M, (2009), 'Should bad law be remedied? The contaminated land provisions in the National Environmental Management: Waste Act', *SAJELP,* volume 16, page 1.
[21] DEFF (2012) "2nd South Africa Environment Outlook".
[22] On page 17.

issued and the number of criminal prosecutions undertaken for infringements of the Waste Act. Generally, there seems to be a disjunct between enforcement action recorded by the government and the actual response to that enforcement action in reality. Furthermore, there appears to be no specific recording on the use of punitive measures within the Waste Act relating to general enforcement of the contaminated land regime. Moreover, business liquidation processes seem to be a significant obstacle in the effectiveness of enforcement action for contaminated land and rehabilitation actions.[23] It is not clear whether this is an issue merely of implementation or whether it arises from deficiencies in the design of the provisions of Part 8 itself, and, if so, whether improving Part 8's provisions will in turn facilitate implementation and enforcement.

The primary research question of this analysis is therefore to consider the extent to which Part 8 of the Waste Act is, or is not, creating an adequate legislative framework that enables the identification, management and rehabilitation of contaminated land.

### 1.3 Key issues for consideration

The analysis addresses the legislative adequacy of the South Africa's contaminated land regime by critically discussing its content and effectiveness of against what is considered to be the best legislative practice for contaminated land regimes. It does so by illustrating elements which are considered to make up adequate contaminated land regimes, as postulated by academic writers and foreign-based organisations. To respond to this question, the analysis considers what reforms would be required to achieve a regime which would be legislatively adequate to allow for the identification, management, and rehabilitation of contaminated land.

A consideration of the best practice for contaminated land regimes,[24] reveals what can be considered to be essential elements to any contaminated land regime, posed by the

[23] See the explanation surrounding Vanchem Vanadium Products (Pty) Ltd and Evraz Highveld Steel in the 2015/2016 NECER report.

[24] Zhao X, (2012), "Developing an Appropriate Contaminated Land Regime in China (Lessons Learned from the US and UK)", D Phil Thesis, University of Western Sydney. Available at https://researchdirect.westernsydney.edu.au/islandora/object/uws%3A31334. [Accessed June 2019.]; Jeffery M & Zhao X, (2012), "Developing a national contaminated land liability scheme in China: The

following questions: Who is responsible for the contamination and its clean-up? When are parties responsible for contaminated site clean-up? What are those parties' responsibilities? How should the government hold those parties responsible?[25] These questions translate into identifiable elements considered by scholars and organisations like the IUCN, essential to a contaminated land regime which is legislatively adequate to enable the identification, management and rehabilitation of contaminated land. These best-practice legislative elements are discussed in detail in this analysis.

In this dissertation, "legislative adequacy" refers to a legislative scheme which is drafted so that is actually enables the government to achieve the legislation's broader ideological objectives with reasonable success. No legislative regime in the world is capable of perfection and this is the nature of legislation and an understanding of the foundational elements of the rule of law.[26] Legislation is made for a purpose determined at a particular point in time, in a factual-landscape which is always changing. The purpose of this analysis is ultimately to assess whether the Part 8's broader ideological objectives to identify, manage, and rehabilitate contaminated land, can be achieved with the legislative elements in Part 8 of the Waste Act.

### 1.4. Methodology and Structure

This dissertation will address this question in the form of a desktop study involving the consideration and comparative study of Part 8 of the Waste Act and its subordinate instruments which make-up the country's contaminated land regime against best-practice legislative elements. The study is thus based on an analysis of primary legislation and relevant subsidiary legislation, as supported through the use of secondary sources including books, journal articles and commentary and guidelines by international organisations. The reason for relying exclusively on international

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comprehensive environmental response, compensation, and Liability Act revisited"*, Journal of Energy and Natural Resources Law*, Issue 30 at page 423.

[25] Caldwell & Wang, (2011), "A Hidden Problem: China's Contaminated Site Soil Pollution Crisis", Vermont Law School. Available at http://www.vermontlaw.edu/Documents/China%20Program/CaldwellWangPaper3.pdf. [Accessed on 8 September 2018]; Jeffery & Zhao, *Energy and Natural Resources Law*.

[26] Ngcobo J's view in *Affordable Medicines Trust and Others v Minister of Health and Another* 2006 (3) SA 247 (CC) at para 108 and the dictum by O'Regan J in *Bertie van Zyl (Pty) Ltd and Others v Minister for Safety and Security and Others* CCT 77/08 [2009] ZACC 11 at para 103.

commentary on other jurisdictions, and eliciting best practices therefrom, is because there is, at present, no binding global agreement on soils and contaminated land[27] and no international best practice guideline or agreed upon international framework which directly concerns the regulation of contaminated land. The most relevant guideline is the one published by the IUCN (discussed in this dissertation),[28] but it focuses on soil conservation, where only a portion of it relates to land contamination.

The analysis is structured as follows.

Chapter 1 (this chapter) is the background chapter. The adverse human, environmental and social impacts associated with contaminated land is introduced as a background. This chapter also sets out the problem statement, the study's focus and methodology.

Chapter 2 considers contaminated land as a concept, contains a discussion on when land is considered to be contaminated and explains what the primary adverse impacts of contaminated land are. This is broken down into what contaminated land is, what the adverse impacts of it is on human health and the environment, and whether there are any adverse socio-economic impacts.

Chapter 3 contains the theoretical context and considers the regulation of contaminated land. The study introduces various elements which can be regarded as the best legislative-practice for a contaminated regime for the identification, management and rehabilitation of contaminated land. Each legislative-element is addressed individually by explaining it and its importance in contaminated land laws.

Chapter 4 sets out a description of South Africa's contaminated land regime with a view to putting the reader in an informed position to assess its legislative adequacy. It does so by describing the legislative history prior to the enactment of any legislation dedicated to contaminated land. The chapter then examines Part 8 of the Waste Act and its subordinate instruments.

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[27] Brandon E, (2011), "The Development and Harmonisation of Domestic Site Contamination Law: The Role of International Law and Other Mechanisms", D Phil Thesis, University of South Australia at page 260.

[28] Hannam & Boer, (2004), "Drafting Legislation for Sustainable Soils: A Guide", *Environmental Policy and Law*, IUCN Environmental Law Programme, Paper No. 52.

Chapter 5 reviews South Africa's contaminated land regime against those best-practice legislative elements which were identified in the study. The dissertation examines the concepts and mechanisms in Part 8 and its instruments and considers whether it will ultimately adequately enable the identification, management and rehabilitation of contaminated land. This analysis also involves proposing legislative reforms where they are seen as needed.

Chapter 6 contains the conclusion which combines some of the primary thoughts of the study and reiterates some of the primary suggestions emanating from the study.

## Chapter 2: The Contaminated Land Challenge

### 2.1. Bio-physical risks and Socio-economic risks

Land and soil is responsible for performing numerous functions which are integral to human and animal life.[29] It follows that when the land which we live and rely on is compromised, the ability to produce food and to live in healthy environments is compromised.

Contaminated land is a site where toxic chemicals that have the potential to be harmful to the environment and to humans are present in higher concentrations than those found normally in the area.[30] Contamination can occur as a result of industrial, agricultural or commercial activities.[31] These include activities such as creosote treatment plants[32], waste disposal[33], mining activities and accidents which introduces an excessive amount of contaminants into an area.[34] Land only has a limited functionary ability to process those contaminants through filtering or transformation.[35] When the land's ability is exceeded, issues such as water pollution, human contact with contaminated soil, plants absorbing contaminants through the soil and landfill gases materialise and the adverse effects associated with those issues are experienced.[36] Human interaction with contaminated land can lead to dire health consequences.

#### 2.1.1. Human Health Risks

Land contamination can adversely affect human health through direct contact with contaminated soil or indirectly by inhalation and digestion through the food chain.[37] There is a globally-shared history of instances where contaminated land has caused

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[29] Görlach et al "Assessing the Economic Impacts" at page 4.
[30] Zhao "Developing an appropriate contaminated land regime" at page 11.
[31] Zhao "Developing an appropriate contaminated land regime" at page 11.
[32] Van Zyl A, (2013) "The effect of a creosote stockyard on the environment, vines and wines", Masters Thesis, University of Stellenbosch. Available at https://scholar.sun.ac.za/bitstream/handle/10019.1/80273/vanzyl_effect_2013.pdf?sequence=2&isAllowed=y. [Accessed on 12 June 2019].
[33] DEFF, 2016 NECER report at pages 52 and 53, for information on land contamination as a result of this activity.
[34] European Commission DG Environment, "Soil Contamination", at page 7.
[35] European Commission DG Environment, "Soil Contamination", at page 7.
[36] European Commission DG Environment, "Soil Contamination", at page 7.
[37] European Commission DG Environment, "Soil Contamination", at page 7.

severe health consequences for humans. Cases which present examples of the dire consequences of contaminated land stretch from the east in China across most the globe to the United Kingdom and to the North and South America and Australia.[38]

The World Health Organisation has described the following contaminants as chemicals of major public health concern: mercury, lead, dioxin, fluoride, hazardous pesticides, cadmium, air pollution, arsenic, asbestos and benzene.[39] Some of these contaminants include heavy metals (arsenic, lead, mercury and lead) and which present the most risk to human health.[40] Studies have also shown that heavy-metal land contamination of urban and agricultural land appears to be a worldwide problem.[41]Heavy-metal contamination, in particular, has dire health consequences for humans. Studies have shown that exposure to lead during the early stages of children's development is linked to a drop in intelligence.[42] Assessments of communities living near hazardous waste sites found those communities to suffer from illnesses and congenital anomalies at birth.[43]

The European Commission reported that our general understanding of how heavy metals in soils lead to human health risks is limited in comparison to our understanding of the risks presented by pollution by air and water.[44] This concern adds to the seriousness of the problem presented by contaminated land.

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[38] Zhang C, "Changzhou pollution scandal highlights holes in China's environmental enforcement" (24 April 2016). Available at https://www.chinadialogue.net/article/show/single/en/8892-Changzhou-pollution-scandal-highlights-holes-in-China-s-environmental-enforcement. [Accessed on 13 November 2018.]; Stodghill D, "Decades after a plant closes, waste remains", (29 July 2007). Available at https://www.nytimes.com/2007/07/29/business/yourmoney/29spill.html. [Accessed on 4 July 2019.]; Plaza et al "A review of lead contamination in South American birds: The need for more research and policy changes", *Perspectives in Ecology and Conservation*, volume 16 at page 201; Plant et al (2014), "Contaminated Soil Wastes in Australia", University of Technology, Sydney. Available at https://www.environment.gov.au/system/files/resources/35be09f5-cb2e-488d-baec-63585a13fc70/files/contaminated-soil-wastes-australia.pdf. [Accessed on 6 August 2019.]

[39] World Health Organisation at http://www.who.int/ipcs/assessment/public_health/chemicals_phc/en/. (Accessed on 1 November 2018.)

[40] World Health Organisation at http://www.who.int/ipcs/assessment/public_health/chemicals_phc/en/.

[41] Zhang et al, (2014) "A review on heavy metal contamination in the soil worldwide: Situation, impact and remediation techniques", *Environmental Sceptics and Critics*, volume 3(2) at page 24 and the authorities cited there.

[42] Brevik & Burgess (2013), "Soils and Human Health", CRC Press, at pages 59 to 80.

[43] Geschwind et al, (1992), "Risk of Congenital Malformations Associated with Proximity to Hazardous Waste Sites", *American Journal of Epidemiology*, volume 135 no. 11 at page 1197.

[44] European Commission DG Environment, "Soil Contamination", at page 9.

### 2.1.2. Social Impacts

Contaminated land also causes adverse social impacts. This was illustrated in the famously-documented case of contamination at the village of Weston, England, which is a long-standing close community and an old-fashioned company town, with a largely working-class community of some 500 houses. Most residents were employed at the large chemicals-production company, ICI, which owned a plant nearby.[45] In 1999, ICI advised the community that hexachlorobutadiene (HCBD) (a waste product of the chlorine industry linked to kidney damage) had been identified seeping from a former quarry used to dispose chemical waste a few decades earlier.[46] ICI designated Weston as its communication zone and the whole village became associated with the incident and was stigmatized.[47] A study of the extent of anxiety in the community found that residents experienced enhanced levels of stress and some experienced grief-like symptoms.[48] The main cause of stress was the decline of the community, including the loss of neighbours and friends and uncertainty about the future.[49]

Studies have also identified factors which make living in contaminated environment in a community stressful.[50] They include lack of personal control over events, confusion, inadequate or contradictory information about the pollution and the possibility of lasting harm.[51] The Love Canal disaster in New York (which involved the leaching of contaminated chemicals during the late 1970s in a small community and the relocation of some 939 families during the 1970s)[52] was found to have put stress onto marital

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[45] Barnes et al (2005) *The Journal of Public Health* at page 277.
[46] Barnes et al (2005) *The Journal of Public Health* at page 277.
[47] Barnes et al (2005) *The Journal of Public Health* at page 277.
[48] Barnes et al (2005) *The Journal of Public Health* at page 277. The study is cited as Barnes et al, (2002), "The Social and psychological impact of the chemical contamination incident in Weston village, UK: a qualitative analysis", *Social Science Medicine*, Volume 55 at page 2227.
[49] Barnes et al (2005) *The Journal of Public Health* at page 277.
[50] Barnes et al (2005) *The Journal of Public Health* at page 277.
[51] Barnes et al (2005) *The Journal of Public Health* at page 277; Baum et al, (1981), "Stress and the environment", *Journal of Social Issues*, Volume 37 at page 4.
[52] See https://www.geneseo.edu/history/love_canal_history.

relationships leading to an increased number of divorces, strain on family relationships and work colleagues.[53]

### 2.1.3. Environmental Impacts

Contaminated land directly impacts the natural environment, but there is value in illustrating the nature of its impacts. To use a less obvious example, electronic waste, is considered to be hazardous waste.[54] Electronic waste is waste which stems from electrical and electronic equipment which often ends up dumped in countries with little or no regulation for its recycling or disposal.[55] In analysing China and Nigeria's soils and plants in relation to electronic waste, a study found the soils to be highly contaminated.[56] Its findings suggest that electronic waste components and constituents can accumulate in the soil and in soil surrounding vegetation elevating it to toxic and genotoxic levels that could induce adverse health effects in exposed individuals, and cause significant human and environmental harm.[57] Given that land contamination does cause adverse human and environmental impacts, it would logically also cause adverse economic impacts.

### 2.1.4. Economic Impacts

The economic costs associated with contaminated land are also significant. A study demonstrated that the economic impacts of current soil degradation trends (through contamination and other factors) in Europe give cause for concern.[58] The estimated monetary costs of the contamination were thought to run into the order of several billion Euro per year.[59] The study revealed that land contamination has an "off-site" cost

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[53] Fowlkes & Miller, (1982), "The Love Canal: the social construction of disaster". Report to the Federal Emergency Management Agency. Available at https://apps.dtic.mil/dtic/tr/fulltext/u2/a125410.pdf. [Accessed on 1 October 2019.]
[54] See, for example, the World Health Organisation's view on this at https://www.who.int/ceh/risks/ewaste/en/. [Accessed on 12 June 2013].
[55] Alabi et al (2012),"Comparative evaluation of environmental contamination and DNA damage induced by electronic-waste in Nigeria and China", *Science of the Total Environment,* volume 423 at page 62.
[56] Alabi et al, "Comparative evaluation of environmental contamination*",* at page 62.
[57] Genotoxicity is a word in genetics defined as a destructive effect on a cell's genetic material (DNA, RNA) affecting its integrity (Shah S, (2012), "Importance of Genotoxicity & S2A guidelines for genotoxicity testing for pharmaceuticals", *IOSR Journal of Pharmacy and Biological Sciences* volume 1, Issue 2, page 43).
[58] Görlach et al "Assessing the Economic Impacts".
[59] Görlach et al "Assessing the Economic Impacts".

associated with it (the “on-site” cost being the costs of the rehabilitation of the site). The study showed that the off-site costs of land contamination are substantial.[60] In some cases, they may exceed the on-site costs by a factor of 10, despite the fact that a large part of the off-site costs could not be quantified.[61] Off-site costs are generally covered by society as externalities and they are not reflected in the decision-making framework of soil owners and users.[62] This is also why the management and rehabilitation of contaminated land requires a dedicated regulatory framework.

### 2.1.5. Attitudes to Contaminated Land

The impacts of contaminated land range from health impacts, to social impacts and economic impacts. As a result, commentators hold the view that while land contamination may not have been given the same prominence and arguably, the same seriousness in the past, largely because it was not as clearly understood as air and water pollution, this has now changed and land contamination is a serious topic in most developed countries.[63]

This attitude is evidenced by the fact that there are numerous countries which have legislated dedicated contaminated land regimes.[64] Not all of these countries are developed countries.[65] Some countries who have enacted specific laws to deal with contaminated land are developing countries such as Russia[66] and Mexico.[67] This is an indication that the contaminated land challenge is one which is recognised as serious enough that there is, arguably, a growing global consensus that the issue requires specific national regulatory attention and legislation to govern that problem.[68]

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[60] Görlach et al “Assessing the Economic Impacts”.
[61] Görlach et al “Assessing the Economic Impacts”.
[62] Görlach et al “Assessing the Economic Impacts”.
[63] Zhang et al, “A review of heavy metal contamination” at page 25.
[64] Some of the countries include Australia, the United States of America, South Korea, the United Kingdom, the Netherlands and Japan.
[65] Austria, New Zealand, Sweden, Italy, Portugal and other developed countries have legislated specific contaminated land regimes.
[66] The Russian Ministerial Decree No. 112 on Land Tenure of Contaminated Land.
[67] General Law for Prevention and Integral Management of Wastes (2004).
[68] Since 1993, representatives from 52 countries joined the International Committee on Contaminated Land including South Africa. http://www.iccl.ch/download/2015_participating_orgs.pdf. [Accessed on 6 August 2019.]

## 2.2. Status of Land Contamination in South Africa

Contaminated land has caused significant challenges in South Africa. To properly illustrate the South African context, it is useful to consider a historical study done to try and establish the extent of South Africa's contaminated land problem. In 1995, the CSIR investigated the extent to which bioremediation of contaminated soil was a viable option in South Africa.[69] The study found that the most frequently utilised practice at that time was to landfill contaminated soil, a practice found to be problematic because space in a hazardous waste landfill sites was rapidly diminishing and suitable new sites are not easily found.[70]

The majority of sites found to be contaminated by the CSIR study were industry related, while there were also domestic waste sites, railway sidings and harbour areas.[71] Twenty three of the sites recorded in the study were situated near surface water, indicating a potential threat of water pollution. All of these sites had an age of 20 years or more, indicating long-term pollution has probably occurred. The study showed that pollution of groundwater had occurred for 24 of the 78 sites.[72]

The study also noted that contamination from petroleum products was most prevalent.[73] Of further concern was the number of sites contaminated with wood-processing chemicals such as creosote, and contamination with pesticides and herbicides.[74] The study's conclusions were that many contaminated sites in South Africa which are known are a cause for concern and that sites contaminated with petrochemicals appear to be the most prevalent.[75] The study also identified many creosote-treatment plants with varying levels of contamination in different parts of the country.[76]

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[69] Pearce et al, (1995) "Bioremediation technology for the treatment of contaminated soils in South Africa", CSIR, WRC Report No. 543/1/95.
[70] Perce et al, "Bioremediation technology" at page 1.
[71] Perce et al, "Bioremediation technology" at page 16.
[72] Perce et al, "Bioremediation technology" at page 16.
[73] Perce et al, "Bioremediation technology" at page 17.
[74] Perce et al, "Bioremediation technology" at page 17.
[75] Perce et al, "Bioremediation technology" at page 19.
[76] Perce et al, "Bioremediation technology" at page 17; Atagana H, (2004), "Bioremediation of creosote-contaminated soil in South Africa by landfarming", *Journal of Applied Microbiology*, Issue 96 at page 96.

Contaminated land is also commonly associated with groundwater contamination. Approximately 13% of South Africa's drinking water supply derives from groundwater resources,[77] yet numerous studies have confirmed the link between land contamination and groundwater contamination in South Africa, elevating the importance of this risk.[78] Whilst the above indicates that there are certainly grounds to warrant investigation and regulation, there are a number of challenges with assessing the extent of contaminated land in South Africa, including a lack of information and enforcement.

### 2.2.1. Lack of Information

The difficulty with trying to measure the extent of land contamination in South Africa lies in the fact that no real widespread analysis has been done historically. The reason for this could be that the costs of such studies would be prohibitive and the historical law governing the issue was inadequate, creating no imperative to study the issue in any meaningful way. Based on the lack of regional information, it appears that people therefore may have only conducted site-specific land-contamination assessments. This is consistent with the belief that a measure of risk presented by hazardous chemicals need be assessed on a site-specific basis.[79]

It's therefore difficult to assess the risk posed by contaminated land and the adequacy of the contaminated land regime where the scope of the challenge remains either unknown or in debate. There seems to be a dichotomy about the prevalence and regulation of land contamination in the country, between the official national government reporting on the state of the environment on the one hand, and the cases which are reported in the media and DEFF's National Environmental Compliance and Enforcement Reports ("NECER") published on behalf of all environmental governmental enforcement agencies.[80]

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[77] Department of Water Affairs and Forestry, (2004) "Groundwater Protection - Guidelines for Protecting Springs".
[78] Davlie et al, (2003), "Contamination of rural surface and ground water by endosulfan in farming areas of the Western Cape, South Africa", *Environmental Health,* Issue 2, Article 1.
[79] Zhao "Developing an appropriate contaminated land regime"; Wong M et al, (2002), "The Restoration and Management of Derelict Land: Modern Approaches", at page 19.
[80] DEFF annually releases the NECER reports.

Reading the NECER reports reveals that there are numerous historical and current cases of contaminated land contraventions across the country across several industries. The reports report many ongoing cases of land contamination, which are linked to adverse effects on nearby communities in almost all provinces.[81] The shortcomings of the reports are that they only highlight individual cases which have actually been pursued by the government, and seem to focus on large industrial production businesses such as ArcelorMittal, BHP Billiton, Exxaro Base Metals, Sappi and Xstrata.

Furthermore, only DEFF is formally reporting on land contamination issues and enforcement actions. This is not to say that provincial authorities are not doing so but the reports show little data on provincial efforts in dealing with contaminated land.[82] There is therefore no readily available information that provincial organs of state are acting to manage contaminated land in any significant manner or that they are obtaining the relevant information in order to make an assessment of the risk contaminated land poses in their provinces.

DEFF recently published a draft State of Waste Report.[83] The report provides a general overview of the quantities and types of waste generated in South Africa and an overview of how much of that is recycled and landfilled. The report does not provide any useful information about land contamination and its environmental and socio-economic impacts to its citizens. The report rather focuses on land degradation from an agricultural and urban-use perspective.[84]

Similarly, the National Waste Management Strategy[85] ("NWMS") does not address the status of land contaminated and is equally unhelpful in determining the extent of the

[81] See the NECER reports dated 2015/16, 2016/2017 and 2017/2018.
[82] Extensive web-based searches using the University of the Cape Town's library databases and other internet databases were unsuccessful in this regard.
[83] DEFF, *South Africa State of Waste Report (Second Draft Report)*, (2018).
[84] DEFF, *South Africa State of Waste Report (Second Draft Report)*, (2018).
[85] Government Notice No. 344 in Government Gazette 35306 dated 4 May 2012. At the time of preparing this dissertation, a Draft Revised and Updated National Waste Management Strategy was published for public comment in Government Notice 1561 in Government Gazette 42879 on 3 December 2019. That draft strategy was not assessed for purposes of this dissertation.

risk. It does, however, report that due to historical absence of statutory obligations to report contaminated land, little data is available on the extent of contaminated sites.[86]

Lastly, the country's contaminated land register[87] is a Microsoft Excel document on the South African Waste Information Centre's website and reveals that currently, there are 393 listed contaminated land sites in the entire country.[88] The document does not give any meaningful details about extent of the contamination on the land and how it poses a significant risk to human health and well-being. It is essentially information put in a table format where it's most valuable columns are titled "nature and origin of contamination" and "site status". In the first-mentioned column, it would simply state "Manufacturing processes and extrusion of products with aluminum" alongside a named site while the "site status" column simply contains remarks like "Monitoring" and "remediation". It does not serve as an adequate repository of information about contaminated land. The 393 sites listed does however provide some guidance that this is an issue of material concern across the country and that there are certainly likely to be more than 393 sites which have yet to be reported.

### 2.2.2. Status of Compliance and Enforcement

There are also challenges in enforcement. The broad-based reporting on the state of the environment does not leave the impression that contaminated land is a pressing issue in South Africa.

The number of compliance notices issued and general enforcement information on the Waste Act are recorded in the NECER reports. In the 2015/2016 report, for example, of the 17 bodies empowered to implement the Waste Act, namely, provincial and national organs of state,[89] only 8 of the 17 actually issued compliance notices totalling 269 in terms of the Waste Act while the report does not isolate contaminated land notices.[90]

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[86] DEFF, *National Waste Management Strategy*, (2011) at page 32.
[87] At http://sawic.environment.gov.za/documents/9398.xlsx.
[88] As of 31 August 2019.
[89] These include Ezemvelo Wildlife, CapeNature, North-West Parks and South African National Parks.
[90] DEFF, 2015 NECER report.

These numbers did not significantly improve between 2015 and 2018, reaching a total of 155 in the 2017/2018 report.[91]

The 2017/2018 NECER reports state that the most prevalent environmental contraventions was unlawful commencement of listed activities under NEMA and unlawful conducting of restricted activities under the National Environmental Management: Biodiversity Act ("NEMBA")[92] and the National Environmental Management: Protected Areas Act[93]. The 2018/2019 NECER report shows a similar pattern.[94]

While there have been court cases involving contaminated land, there have been no significant court cases which give direction about what is successful about Part 8 and where there are deficiencies. There is very little information available about the legislative adequacy of South Africa's contaminated land regime in relation to the management and rehabilitation of contaminated land.

The NECER reports also reveal one or more trends. There seems to be a lack of appreciation in more than one industry-sector that significant land contamination can occur contaminating material comes into direct contact with soil. This was demonstrated in the fishing processing, timber treatment and the ferro-alloy, iron and steel industries.[95] Practices in those industries have resulted in land contamination which has led DEFF to take enforcement action. In December 2016, 78 warning letters were issued to members of the timber treatment industry informing them of the required preventative operational measures (such as preventative tarps) which must be implemented to prevent land contamination.[96] This seems to suggest that there is a trend towards the positive and towards increased enforcement of contaminated land. This illustrates that the national government is taking most of the enforcement action and not regionally, by provincial agencies and municipalities. However, dedicated

[91] DEFF, 2017 NECER report.
[92] Act No. 10 of 2004.
[93] Act No. 57 of 2003.
[94] Page 18 of the 2017/2018 NECER.
[95] See generally, the 'Industrial Compliance and Enforcement' sections of the NECER reports ranging from at least 2015 to 2017/2018.
[96] Page 59 of the 2016/2017 NECER report.

contaminated land enforcement statistics remain unreported and are not reported as remediation orders.[97] The NECER reports highlights on ad hoc prominent cases.

Seemingly, one of DEFF's most prominent contaminated land cases, at ArcelorMittal in Vanderbijlpark, may be demonstrative that contaminated land and the regulatory mechanisms designed for it, may not be working. Despite establishing that the site has land contamination which has affected communities' health near to the site,[98] that company has not significantly changed its practices or rehabilitated the affected environment with the result that, after community-based pressure, the company was been formally criminally charged in 2019.[99] DEFF was also criticised for not taking action against the company,[100] even though DEFF issued ArcelorMittal with compliance notices, including a land remediation order.[101]

It seems that remediation orders in Part 8 are being utilised as authorisation mechanisms, as opposed to enforcement mechanisms. Companies are submitting applications for remediation orders and are then being issued with remediation orders. A remediation order was, for example, issued to the Shell Modderfontein Service Station as a result of its application for remediation.[102] This approach suggests that no matter how severe the contamination, the polluter is dealt with as an entity seeking regularisation and is not subject to any criminal or civil sanction.

### 2.2.3. Legal Implications

There is a degree of risk associated with contaminated land, and there are sporadic case examples of serious land contamination, yet the full extent of the current risk at a national level remains unknown. Furthermore, to date, compliance and enforcement action has been slow. There are a few case examples of remediation orders being

[97] See, for example, how enforcement statistics are reported on page 15 of the 2018/2019 NECER report.
[98] See paragraph 52 of *Company Secretary of ArcelorMittal South Africa v Vaal Environmental Justice Alliance* 2015 (1) SA 515 (SCA).
[99] https://www.iol.co.za/business-report/companies/arcelormittal-has-to-answer-for-environmental-contraventions-in-court-26218569.
[100] Opinion of the Centre for Environmental Rights reported at https://www.iol.co.za/business-report/companies/arcelormittal-has-to-answer-for-environmental-contraventions-in-court-26218569. [Accessed on 17 August 2019.]
[101] NECER reports of 2015/2016, 2016/2017 and 2018/2019.
[102] The remediation order is available at http://sawic.environment.gov.za/sawis-license/documents/download/2691. [Accessed on 25 September 2019.]

issued but it seems that these are treated as authorising instruments, as opposed to punitive sanctions, and there has yet to be large-scale enforcement action of the Waste Act. This may be changing, based on the most recent example of the timber treatment industry, and can be justified to a degree in that the Act is relatively new legislation. However, given that Part has been in force for more than five years, more enforcement action would be justified. This calls into question the adequacy of the Act's provisions, including its provisions relating to information gathering and notification, and its instruments for sanction. The section which follows will consider international best practices relating to legislating for contaminated land both with a view to addressing these challenges and to deliberate on the adequacy of Part 8 as a whole.

# Chapter 3 - Theoretical context: Legislative best-practice for the regulation of contaminated land

## 3.1 Principles underpinning a legislative framework

If one accepts the premise that the identification, management and rehabilitation of contaminated land requires a dedicated regulatory regime, the next questions which arise are: What would be the broad goals of such a regime? And, what are the principles which should underpin which such a regime? These goals and principles influence practical decisions around contaminated land and should be incorporated in the regime. This issue has not been written on extensively but based on the writings of Brandon, Bardos, Zhao and others, it is possible to assimilate a number of potential principles which could underpin a contaminated land regime.

Bardos identifies six principles which influence decision-making in the rehabilitation of land.[103] Bardos' view was that these factors influence decisions those decisions: Driving forces behind rehabilitation, risk-management, sustainable development, stakeholder satisfaction, costs versus the benefits, and technical feasibility.[104]

Zhao also recommended principles that China should incorporate into their national contaminated land regime:[105] The protection of human health; the sustainable remediation principle; risk-based land contamination management; the effective clean-up principle; public participation and the economic principle (cost-effectiveness).[106] Assimilating these views, it is possible to propose six goals for a contaminated land regime.

Goal 1. Human health and well-being. The regime should seek to protect human health and well-being. A regime may be designed that it does not focus too narrowly on the environment as its primary target of protection.[107] This is not to say that the environment should not be protected but the objective should be to mitigate

[103] Bardos et al, (2002), "General principles for remedial approach selection", *Land Contamination & Reclamation,* Volume 10(3).
[104] Bardos et al, "General principles".
[105] Zhao "Developing an appropriate contaminated land regime" at page 199.
[106] Zhao "Developing an appropriate contaminated land regime" at page 199.
[107] Zhao "Developing an appropriate contaminated land regime" at page 200.

contaminative impacts on humans as a priority, generally. That environmental legislation should have, as its primary focus, human health and well-being is supported by the environmental rights in section 24 of the Constitution: "Everyone has a right—… (a) to an environment that is not harmful to their health or well-being."[108]

Goal 2. Sustainable Development. The regime should seek to promote sustainable development through its provisions. The goal should be to ensure that whatever action is taken, that the action is not narrowly aimed at one facet of sustainable development such as environmental conservation, but that there is a broad-enough assessment to seek a solution which is environmentally, socially and economically of value. For example, the law must allow that where future re-use of a site is unlikely, a wider range of social and environmental benefits should be considered instead of a narrow consideration for economic value.[109] Bardos points out that there must be recognition that not all rehabilitative work is initiated for the same reason and this will greatly affect the ultimate rehabilitation goal.[110] Some rehabilitative work is done to avoid potential liability, some to enable redevelopment or to repair prior rehabilitative work or redevelopment projects.[111] Domestically, NEMA dictates that decisions by organs of state which may significantly affect the environment must ensure that sustainable development is socially, environmentally and economically sustainable.[112]

Goal 3. Fairness. Zhao's view is that fairness is the ultimate objective of the whole legal system governing contaminated land.[113] This can be achieved through various mechanisms such as the polluter-pays principle. The regime should facilitate decisions surrounding identification, management and rehabilitation which is fair to all parties involved, including the polluter, the affected stakeholders and the owner or occupier of the site. Where direct fairness is not attainable, the regime could enable the aggrieved party to seek fairness through follow-up legal measures where the law itself could create a legislated course of action so that a person who pays for rehabilitation could

[108] Constitution of the Republic of South Africa, 1996.
[109] Zhao "Developing an appropriate contaminated land regime" at page 200.
[110] Bardos et al, "General principles" at page 138.
[111] Bardos et al, "General principles" at page 138.
[112] Section 2(3) of NEMA.
[113] Zhao "Developing an appropriate contaminated land regime" at page 118.

seek reimbursement from other culpable parties. Similar recovery provisions are already contained in NEMA.[114]

Goal 4. Risk-based land management. The regime must be able to facilitate land management solutions which are site-specific, risk-based and where human impacts are the first priority (aligned with Goal 1). Risk-based contaminated land management decisions allows for reasonable decision-making by avoiding rehabilitation goals which are unrealistic, unaffordable or impracticable so that some rehabilitation is in fact achieved.[115] NEMA's principles for decision-making prescribe that sustainable development requires a consideration of people's environment, economic and social interests.[116] Risk-based management means remediating the site so that not everything is cleaned completely but rather that it is cleaned to a state acceptable to the vulnerability status of the receptor. This this may not be palatable to many but this is the essence of taking a pragmatic, balanced approach to rehabilitation.

Goal 5. An effective and efficient rehabilitation regime. One criticism of the contaminated land regimes in England and the USA is that rehabilitation of land was often too slow.[117] A regime cannot claim to be effective if it is not able to be implemented with reasonable efficiency. Over-prescription of duties on organs of state which act as implementers may also adversely affect the efficient implementation of the regime. The United Kingdom's contaminated land regime in Part 2A of the Environment Protection Act 1990[118] has come under criticism for being unworkable but specifically for its over-prescription of duties on the state.[119] The law should be pragmatic.

Goal 6. Public participation and transparency. Publication participation in decision-making about contaminated land is crucial. Experience teaches that stakeholder-opinion is so important that even if technical experts may agree on certain decisions, it

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[114] Sections 28(8), 28(9) and 31N of NEMA.
[115] Bardos et al, "General principles" at page 138.
[116] Section 2(3) of NEMA.
[117] Borenstein D, (2013), "A Vicious CERCLA, Or The Twilight of the Superfund", Student Thesis, Fordham University. Available at https://fordham.bepress.com/environ_theses/2/. [Accessed on 19 June 2019.]
[118] 1990 c. 43.
[119] Fogleman V, (2014), "The contaminated land regime: Time for a regime that is fit for purpose Part 1", *International Journal of Law in the Built Environment*, Volume 6, Issue 1 at page 43.

would not be wisely carried out if the affected stakeholders are not largely supportive of it.[120] The primary objectives of any process involving contaminated land typically do not consider the overall environmental and socio-economic effects of the remediation work.[121] Wider socio-economic issues include impacts on local businesses and inward investment, impacts on local employment and the local (micro) economy, the possible amenity value of the site and the removal of blight.[122]

NEMA also prescribes that the participation of all interested and affected parties in environmental governance must be promoted and that the participation of vulnerable and disadvantaged persons must be ensured.[123] All of this is underpinned by the constitutional right of individuals to fair administrative justice contained in section 33 of the Constitution and elaborated in the Promotion of Administrative Justice Act[124] ("PAJA"). The Constitution and PAJA prescribes that the comments and inputs of those affected by government decisions must be elicited and considered prior to the taking of those decisions.

This chapter will now describe elements which commentators, international organisations and others have recognised as best-practice legislative elements for contaminated land regimes.

### 3.2. Elements of a contaminated land legal regime

The IUCN has published guidelines for developing national legislation on soil conservation.[125] Brandon noted that this is the closest any organisation has come to a model law on land contamination, although it primarily focuses on soil conservation.[126] Some of the elements that the guide recommends for a national soil conservation law includes: a soil information and knowledge system, monitoring of the condition of soil,

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[120] Bardos et al, "General principles" at page 140.
[121] Bardos et al, "General principles" at page 141.
[122] Bardos et al, "General principles" at page 141.
[123] Section 2(4)(f) of NEMA.
[124] Act No. 3 of 2000.
[125] Brandon, "Domestic Site Contamination Law" at page 225 in relation to Hannam & Boer, *Environmental Policy and Law*.
[126] Brandon, "Domestic Site Contamination Law" at page 225.

public participation in the protection of soil, criminal and civil enforcement mechanisms, and a duty to notify the state of the occurrence of a pollution-threatening activity.[127]

In 2018, the Chinese Council for International Cooperation on Environment & Development ("CCICED") undertook a study to develop its dedicated contaminated land legal regime which included a study on land contamination laws from across the world.[128] The study recommended that several elements be incorporated into the proposed Chinese soil pollution law, which elements they considered to be best-legislative practice.[129] They include that there must be a specified scope and objective for the law including pollution prevention, remediation of contaminated sites, economic incentives for redevelopment of contaminated property and risk abatement of imminent and threats to human health and the environment. They also recommended that the law clearly identifies responsible persons regulated under the law like landowners, businesses, polluters, property developers, financial institutions and government entities. They were also in favour of an express public participation process. Furthermore, they recommended a funding mechanism to ensure that there's adequate resources to rehabilitate certain contaminated land such as "legacy contaminated sites" (sites contaminated prior to the enactment of the law) and "orphan sites" (sites where there is no potential responsible party ("PRP") or one which has been abandoned), satisfy the law's objectives and build capacity.

The preferred legislative elements of a land contamination legal regime identified by the CCICED and the IUCN are also recommended by international scholars as best-practice elements of an adequate contaminated land regime.[130] Whilst it goes beyond the scope of this dissertation to outline the individual recommendations by these scholars, based on their views and the above recommendations of the IUCN and

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[127] Hannam & Boer, *Environmental Policy and Law* from page 76.
[128] CCICED, (2015), "Special Policy Study on Soil Pollution Management". Available at https://www.iisd.org/sites/default/files/publications/CCICED/prevention/2015/policy-study-on-soil-pollution-management.pdf. [Accessed on 28 August 2019.]
[129] CCICED, "Special Study" at pages 18 and 26.
[130] Caldwell & Wang, "A Hidden Problem"; Zhao "Developing an appropriate contaminated land regime" at pages 118, 270, 271 and 275; Jeffery & Zhao, *Energy and Natural Resources Law*; Brandon, "Domestic Site Contamination Law" from pages 281 to 285, and 305. Locally, see also Kidd's analysis on what a contaminated land regime ought to do (Kidd (2009) *SAJELP*.)

CCICED, the following can be put forward as some of the primary recommended best-practice legislative elements for a contaminated land regime:

- the polluter-pays principle;
- identification of the “potential responsible party” (or parties);
- retrospectivity of the regime;
- strict liability;
- public participation in the decision-making process;
- joint and several liability;
- state liability and a funding mechanism;
- financial incentives for pollution prevention and voluntary remediation;
- regulatory process for site identification, investigation, assessment and remediation;
- national contaminated sites register; and
- the principles of fairness and equity.

What follows is a brief explanation of each element and its importance in a land contamination regime.

### 3.2.1. The polluter-pays principle

The polluter-pays principle is a commonly understood principle of international environmental law which dictates that those who causes pollution should bear the costs of managing it to prevent damage to human health or the environment.[131] It was Principle 16 adopted at the 1992 United Nations’ Conference on Environment and Development.[132]

[131] http://www.lse.ac.uk/GranthamInstitute/faqs/what-is-the-polluter-pays-principle/. [Accessed on 2 September 2019 2019.]
[132] Codified as part of 27 principles in a document titled the Rio Declaration on Environment and Development.

In the context of land contamination, it is considered to be a key component because it seeks to hold the polluter responsible to ensure the clean-up of the contaminated land. While the polluter-pays principle is best legislative standard, it has been noted that there are difficulties with its implementation sometimes.[133] For the measures underwritten by the principle to succeed, there must at least be an identified polluter, the polluter must be financially capable of rehabilitating the land and be willing to do so. Even in developed countries, this is mostly not the case.[134] Therefore, while a contaminated land regime should be based on the principle that the polluter must pay, consideration must be given to allow the law to extend itself to other mechanisms where implementation problems present challenges to obtaining financial relief from the polluter. The South African Parliament supports the incorporation of this principle in national law, including for example, in section 2 of NEMA[135] and section 28 of NEMA (section 28 of NEMA contains a general duty of care on everyone who has caused significant pollution or degradation of the environment to take reasonable measures to prevent such pollution or degradation).

### 3.2.2. The identification of the potential responsible party (or parties)

The identification of parties responsible for contamination is essential to the overall effectiveness of the regime.[136] Not only should a contaminated land law contain provisions aimed at the speedy identification of the person responsible for the pollution but also any PRPs. A PRP is a party who has caused or may have contributed to the land's contamination.[137] Several countries including Canada, Australia and the USA, recommends the identification of classes of persons as PRPs.[138] Under the USA's

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[133] Brandon, "Domestic Site Contamination Law" at page 40.
[134] European Environment Agency, European Union, (2007), "Europe's Environment: The Fourth Assessment" at page 116.
[135] Section 2(4)(p) of NEMA.
[136] Brandon, "Domestic Site Contamination Law" at page 322.
[137] Jeffery & Zhao, *Energy and Natural Resources Law*.
[138] In Canada, the Canadian Council of Ministers of the Environment contended that a list of classes of persons who may be responsible including current and past owners of land, tenants and other occupiers. Canadian Council of Ministers of the Environment, (2006), "Recommended Principles on Contaminated Sites Liability", PN 1361, ISBN-101-896997-53-8. Available at https://www.ccme.ca/files/Resources/csm/csl_14_principles_e.pdf. [Accessed on 5 September 2019.]

Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"),[139] liability may apply to the following classes of PRPs:

- the current owner or operator of the site;
- the owner or operator of a site at the time that the disposal of a hazardous substance, pollutant or contaminant occurred;
- a person who arranged for the disposal of a hazardous substance, pollutant or contaminant at a site; and
- a person who transported a hazardous substance, pollutant or contaminant to a site, who also has selected that site for the disposal of the hazardous substances, pollutants or contaminants.[140]

The PRP-identification element is theorised as important in that it allows the law to cast its net of liability wide under the general objective of ultimately trying to rehabilitate the land.[141] In imposing liability, the justification is held that each of the PRPs, at one time or another, had control of the hazardous substance and thus each had the ability to prevent or minimise the harm.[142] This is similar to the wide net of potentially liable parties provided for in sections 28(8) and 28(9) of NEMA, in recognition of the benefit of having a wide net of PRPs.

### 3.2.3. The retrospectivity of the regime

As the term implies, this element contemplates that liability under a land contamination law will apply to those parties' pollution-causing conduct which occurred before the law's enactment. With contaminated land, this element is both important and interesting as it elicits a thought-provoking exercise on the balancing of rights, societal notions of fairness and the applicability of the rule of law.

With land contamination, an element of this nature is seen as a useful legal mechanism because the harmful impacts associated with contaminated land often only manifests

[139] 94 Stat 2767 (1980) and codified as amended at 42 USC section 9601 to 9675 (2006).
[140] 42 USC section 9607(a)(1) to (4).
[141] Jeffery & Zhao, *Energy and Natural Resources Law*.
[142] *Jeffery & Zhao, Energy and Natural Resources Law*.

long after the pollution-causing act took place.[143] Caldwell and Wang noted, in relation to the proposed Chinese contaminated land law, that the absence of retrospective liability in China's current laws is a problem because many of the contaminated sites contain historical pollution.[144] The retrospectivity of the regime would enable the rehabilitation of "orphan sites", a contaminated site abandoned by its owners or its polluters where no party can be held liable.[145]

Interestingly, the question arises whether one should hold liable those who contaminated the land, but whose actions were lawful at the time that they undertook the actions. Those actions may not have been unlawful in terms of legislation or may have been lawfully permitted by some authorisation. Would it be fair to do so? There is no uniform approach to dealing with this question. In terms of section 25(3) of Western Australia's Contaminated Sites Act,[146] a person who caused, or contributed to, the land contamination before the commencement of that Act is responsible for remediation of the site only to the extent that the person caused, or contributed to, that contamination by an unlawful act. This approach therefore only impose liability where the conduct was unlawful at the time. The benefit of doing so is that it is arguably more fair to parties who polluted the land in the past on the basis that they can only be held liable for acts of pollution which were unlawful. The disadvantage is that the regime's effectiveness is partially compromised because it would be limited in its ability to deal with historic contamination to unlawful acts and therefore its ability to legally compel rehabilitation on the basis of those acts.

Saxe's discussion on this topic and the complexities of the issue, is enlightening.[147] With the Canadian Charter of Rights and Freedoms, Saxe notes that one of the fundamental principles of a free society is that anything which is not forbidden is permitted. That is, acts and omissions which are not forbidden under the law of the day

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[143] European Environment Agency, *Europe's Environment: The Fourth Assessment,* (2007) at page 116.
[144] Caldwell & Wang, "A Hidden Problem".
[145] Brandon, "Domestic Site Contamination Law" at page 23.
[146] Act 60 of 2003.
[147] Saxe D, (1992), "Retrospective liability for environmental contamination", *The Canadian Bar Review*, Volume 71, No. 3.

are therefore legally permitted.[148] Once an act or event occurred in reliance on the law at the time, it is unfair to change the law when it is no longer possible for the actor to comply.[149] Such retrospectivity denies even the conscientious an opportunity to comply with the law and in her view, it is profoundly inconsistent with rule of law.[150] Saxe asks for awareness of the complexities associated with retrospective-liability regimes in environmental law. She notes that there is a distinction between those acts which were honestly believed to be innocent when they occurred, and those which were known to endanger or harm others but escaped liability at the time.[151] While most environmental laws are relatively recent in age, earlier pollution, which may have been legal, may still have contravened general community standards of what may have been considered right or wrong at the time.[152] Such acts may have infringed general prohibitions against nuisance, harm to others or endangering human life.[153] Ordinarily, municipal laws would cover prohibitions of this nature and give an indication of the community's standards of the time.[154] Saxe raises the notion that a consideration is payment for clean-up costs by society as a whole.[155] This recognises that society may have benefited from the pollution act as an economic activity at some time through providing jobs, household income and taxes.[156] This does not excuse pollution acts, but there has to be a balancing of interests as the issue is far from straight-forward.

In South Africa, because of the country's past discriminatory economic practices, absolution for businesses who drove the economy at the time (although the country operated under a heinous discriminatory regime) may not be a straight-forward question because the benefit of their acts to the South African society in general is one which is not easily rationalised.

Section 24 of the Constitution requires that "reasonable legislative and other measures" are taken to give effect to that environmental rights clause. In doing so, Parliament

[148] Saxe, *The Canadian Bar Review* at page 502.
[149] Saxe, *The Canadian Bar Review* at page 502.
[150] Saxe, *The Canadian Bar Review* at page 502.
[151] Saxe, *The Canadian Bar Review* at page 502.
[152] Saxe, *The Canadian Bar Review* at page 503.
[153] Saxe, *The Canadian Bar Review* at page 503.
[154] Saxe, *The Canadian Bar Review* at page 503.
[155] Saxe, *The Canadian Bar Review* at page 506.
[156] Saxe, *The Canadian Bar Review* at page 506.

enacted section 28 of NEMA (that applies to contaminated land) which applies retrospectively.[157] In a sense, the legislature has already pronounced on the issue that "reasonable measures" are required retrospectively in respect of contaminated land. An unjust outcome of a law that does not apply retrospectively where it would be appropriate, occurred in the judgement in *Bareki v Gencor*[158] where parties brought an application against mining companies for an order requiring they take measures to rectify mining-related pollution of the environment between 1976 and 1981.[159] Their court action was based on section 28(1) of NEMA (prior to its amendment where the amendment expressly made that section apply retrospectively).[160] The companies argued that section 28(1) did not apply because it was enacted in 1999 after their pollution acts, and it did not apply retrospectively. The Court held in favour of the companies and found that sections 28(1), (2) and (3) of NEMA were not retrospective. Negative academic critique of the judgment ensued where it was noted that a failure to make the law retrospective as it concerns land pollution, may be contrary to the Constitution.[161]

Saxe, in turn, identifies factors which may be relevant when imposing retrospective liability:

- the good faith of the defendant;
- economic benefit the defendant received from the pollution act; and
- the impact of the remediation order.[162]

It's more difficult to justify a remediation order which would financially devastate an old pensioner than a wealthy multi-national company.[163] It would be more difficult to justify

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[157] Section 28(1A)(a) of NEMA.
[158] *Chief Pule Shadrack VII Bareki NO and Another v Gencor Limited and Others* 2006 (8) BCLR 920 (T).
[159] From the helpful summary is contained at https://cer.org.za/virtual-library/judgments/high-courts/chief-pule-shadrack-vii-bareki-no-and-another-v-gencor-limited-and-others-2006-8-bclr-920-t. [Accessed on 12 December 2019.]
[160] Section 28(1A).
[161] Field T, "Letting polluters off the hook? The impact of Bareki NO v Gencor Ltd 2006 (1) SA 432 (T) on the reach of s 28 of the National Environmental Management Act 107 of 1998", *South African Journal of Environmental Law and Policy*, Volume 14(1), May 2007 at page 105.
[162] Saxe, *The Canadian Bar Review* at page 506.
[163] Saxe, *The Canadian Bar Review* at page 506.

an order against a conscientious company who obeyed all of the laws at the time and acted in good faith, than a company who knew its wastes to be dangerous and acted in a way which engendered the environment and human health.[164] The point is that the blanket imposition of retrospective liability by legislative provision may not fair in all cases and a more balanced approach may be more appropriate. In South Africa, it is a constitutional right not to be convicted for an act or omission that was not an offence under either national or international law at the time it was committed or omitted.[165]

A balanced approach means not being necessarily convicted for historic contamination acts which were lawful but still being subject to take reasonable measures against land contamination in the present day and being held accountable for taking those measures, and in enforcing retrospectivity, having regard to all of the circumstances of each case.

### 3.2.4. The application of strict liability

With strict liability, liability is strict in the sense that liability will ensue if it is proved that the relevant party committed the act which gave rise to the contamination, irrespective of fault.[166] The state does not have to prove whether the contamination resulted from negligence or if the conduct was intentional.[167] The result is that liability for contamination can be determined quickly and possibly avoiding litigation.[168] Strict liability also reduces the likelihood that contaminated land will be abandoned.[169] A similar approach is followed in South Africa. In the *Bareki* case (above), the court held that section 28 of NEMA created strict liability on the basis that the duty to take measures to prevent the pollution flows by virtue of pollution being caused and the defence of why the pollution was caused in the first place is irrelevant.[170] Interestingly, the legislation then amended section 49A of NEMA to provide for a statutory offence for

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[164] Saxe, *The Canadian Bar Review* at page 506.
[165] Section 45(3)(l) of the Constitution.
[166] Brandon, "Domestic Site Contamination Law" at page 324.
[167] Brandon, "Domestic Site Contamination Law" at page 324.
[168] Brandon, "Domestic Site Contamination Law" at page 324.
[169] Kingsbury A, (1998), "Funding the Remediation of Contaminated Land in Australia and New Zealand: the Problem of Orphan Sites", 6 Waikato Law Review 37 at paragraph 57.
[170] Page 440 of the judgment.

"negligently" failing to prevent significant contamination from occurring.[171] It's unclear whether this means that the section 28 power to issue a directive no longer creates strict liability. South Africa's approach, therefore, in section 28 of NEMA is very similar to that found in contaminated land regimes and in theory, South Africa's approach in its contaminated land regime should be consistent.

It has been pointed out that in modern times, a law-makers steer more towards strict liability while fault-based liability is being used less in states' environmental laws and contaminated land laws.[172] Courts are increasingly wary of imposing strict liability for contamination at common law, and are preferring to leave it to legislatures to impose liability by legislation because environmental law is perceived as being of growing public interest and importance.[173]

Strict-liability in the context of a contaminated land regime is therefore very important.

### 3.2.5. Public participation in the decision-making process

Public participation involves requiring the affected public to not only participate in the final decision-making, but also in the processes leading up to various decisions in the whole process. The European Network for Industrially Contaminated Land has, for example, advocated that affected stakeholders should be consulted about decisions involving the risk assessment and management which takes place early in a contaminated land process.[174]

It has also been noted that public participation not only benefits the stakeholders concerned but provides guides on the most appropriate rehabilitation action to take.[175] A public consultation mechanism should be tailored to the particular cultural and political circumstances of each country.[176] South Africa's environmental law has a strong

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[171] Section 49A(1)(e) of NEMA.
[172] Brandon, "Domestic Site Contamination Law" at page 325.
[173] Kingsbury, *Waikato Law Review*; McDonald J, (1994), "Financial Liability for Contaminated Site Clean ups - The Increasingly Strict Standard of Fault-Based Liability", *Environmental and Planning Law Journal* 11 (6) at page 516.
[174] Network for Industrially Contaminated Land, (2002), "Discussion Paper on: Need for Sustainable Land Management: Role of a Risk Assessment Based Approach", Issue No 2 of 2002.
[175] Brandon, "Domestic Site Contamination Law" at page 354.
[176] Brandon, "Domestic Site Contamination Law" at page 354.

constitutional and legislative basis for undertaking public participation processes. Section 33 of the Constitution guarantees everyone the right to fair administrative justice which requires that the public is consulted where laws or actions may materially affect their rights. This constitutional right was expressed legislatively in PAJA.[177] In turn, section 2(4)(g) of NEMA states that decisions must take into account the interests, needs and values of all interested and affected parties. Therefore, public participation should be take place at all stages of the decision-making process, and not be restricted to the decision.

### 3.2.6. Joint and several liability

Joint and several liability means that in instances where there is more than one PRP, each PRP is held individually liable for all of the costs, but where one party is incapable of paying for their proportional share of the damage, the other party will be held liable for the difference.[178] The state can also pursue one PRP for the full costs and it is up to that party to seek reimbursement from other PRPs who contributed to the harm.

This element is useful in that it encourages PRPs to engage one another to decide on liability between them without immediate recourse to litigation.[179] However, practically, it may have its limitations as it may lead to more litigation because, for example, it relies on the parties to work out the apportionment of liability among themselves.[180] A local example of where this can occur transpired in the facts surrounding the Harmony Gold mining cases where a group of mining companies responsible for the pumping of mining shafts which prevents water pollution, could not resolve among themselves the apportionment of responsibility and ultimately lead to government enforcement action and litigation.[181]

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[177] Section 4 of PAJA.
[178] Deloddere S and Ryckbost D, *Liability for contaminated sites,* (1997), European Commission. Available at https://ec.europa.eu/environment/legal/liability/pdf/soilcont.pdf. [Accessed on 25 October 2019.]
[179] Brandon, "Domestic Site Contamination Law" at page 325.
[180] Chang & Sigman, (2007), "The effect of joint and several liability under superfund on brownfields", *International Review of Law and Economics*, Volume 27, Issue 4 at page 363.
[181] *Harmony Gold Mining Co Ltd v Regional Director: Free State, Department Water Affairs and Forestry* (2006) JDR 0465 (SCA) and Harmony Gold Mining Co Ltd v Regional Director: Free State Department of Water Affairs, and Others 2014 (3) SA 149 (SCA).

This element can also lead to the "deep pockets" syndrome where the state would rather pursue the PRP who they know to be most financially capable of paying for the damage and not necessarily the other PRPs.[182] This may lead to unfairness in that the PRPs which is then not pursued because of their poorer financial status, may actually be equally or more at fault than the party who was pursued because of their better financial situation. Despite its limitations, joint and several liability is an important component of any contaminated land regime on the basis that it simplifies the imposition of liability from the state's perspective and facilitates the rehabilitation of contaminated sites.[183]

### 3.2.7. Fairness and equity

As explained above, joint and several liability mechanisms may not always result in a fair conclusion for a PRP. There should therefore be some mechanism that allows regulators to impose a fairer outcome addressing liability. This was a particular problem with the USA's CERCLA to such an extent that CERCLA was amended[184] to allow the EPA to negotiate settlement agreements with PRPs whenever practicable and in the public interest to expedite remedial actions and minimise litigation.[185] This allows the EPA to seek a fair and balanced liability settlement among PRPs.[186] Even when PRPs make a settlement offer within 60 days of the section 122 CERCLA process having started,[187] the EPA is authorised to begin negotiations only if the offer comes from a sufficient number of PRPs which constitutes a substantial proportion of the site's clean-up costs. This provision was included to make the liability system in CERCLA more fair.

Kidd also points out that the UK's Environmental Protection Act[188] adopted a system to address fairness.[189] He notes that under section 78E(1) of that Act, remediation notices

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[182] See the concerns raised during deliberations about joint and several liability in Canadian Council of Ministers of the Environment, "Recommended Principles".
[183] Zhao "Developing an appropriate contaminated land regime" at page 87.
[184] Superfund Amendments and Reauthorization Act, 1986 (100 Stat 1613).
[185] Dinkins C, (2012),"CERCLA Settlement Considerations", *The Practical Real Estate Lawyer* at page 42. Available at https://www.velaw.com/uploadedfiles/vesite/resources/prel1201_dinkins.pdf. [Accessed on 8 September 2019.]
[186] Dinkins, *Real Estate Lawyer* at page 43.
[187] Section 122 of CERCLA contains the process for the negotiated settlement agreements among PRPs.
[188] 1990.

may be issued to every person who is regarded as an "appropriate person".[190] That Act distinguishes between Class A PRPs who are those who hold primary liability and Class B PRPs who hold secondary liability in circumstances set out in the Act.[191] Class A PRPs are those who caused or knowingly permitted the contaminating substances.[192] If no Class A PRP is found, the Class B PRP is liable.[193]

A contaminated regime should therefore contain joint and several liability and some extra mechanism which provides some discretion to ensure a fair outcome.

### 3.2.8. State liability and a funding mechanism

This element entails the government being responsible for rehabilitation where there are no viable PRPs to pursue. The law would compel the government to perform rehabilitation in specified circumstances.[194] A public funding mechanism can be created to pay for such rehabilitation.

State liability may be warranted in certain circumstances. There may be no viable PRPs where a party ceases as a legal entity, or the party is not financially able to pay, or where there are no identified PRPs (orphan sites).[195] Orphan sites even pose a pose a problem in developed countries decades after their closure.[196] South Africa has a historic legacy of mining and industrial activities which has led to historic contamination.[197] Identifying PRPs for historically contaminated sites can be difficult, they may be no longer in business or lack the financial resources for rehabilitation.[198] Furthermore, contamination in certain cases may be such that urgent rehabilitation action is required to avoid adverse impacts to human health and well-being. In these cases, state intervention may be warranted. The CCICED recommended that historically contaminated lands pose long-term environmental risks which not only

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[189] Kidd (2009) *SAJELP*.
[190] Kidd (2009) *SAJELP* at page 17.
[191] Kidd (2009) *SAJELP* at page 17.
[192] Section 78F(2) of the UK's Environmental Protection Act, 1990.
[193] Section 78F(2)(4).
[194] Jeffery & Zhao*, Energy and Natural Resources Law* at page 462.
[195] Jeffery & Zhao*, Energy and Natural Resources Law* at page 462.
[196] Brandon, "Domestic Site Contamination Law" at page 354.
[197] Mathee A, (2011), "Environment and health in South Africa: Gains, losses, and opportunities", *Journal of Public Health*, Volume 32 (section 1).
[198] CCICED, "Special Study".

threaten ecological and environmental security, but also prevent those sites from being brought back into the economy through redevelopment.[199]

The European Commission adopted the Draft Soil Framework Directive in 2006, which addresses soil protection and as part of that, land contamination.[200] That draft directive recommended that for contaminated sites where the polluter cannot be found, cannot be held liable under national legislation or cannot be compelled for rehabilitation costs, European member states must take responsibility for reducing risk to human health and the environment.[201] The directive recommends that member states should adopt specific funding mechanisms to ensure a durable financial source for remediating such sites.

The USA's "Superfund" (its colloquial name) was established through CERCLA. At the end of 2018, the Superfund rehabilitated 1507 sites since its inception, where 529 sites returned to productive economic use by providing of employment and generating income.[202] The Superfund uses criteria to decide which sites obtains funding.[203] This illustrates a fund's benefit for use in specified circumstances.

For South Africa, Kidd recommends that at the very least, South Africa should have a budget to pay for rehabilitation of contaminated land where PRPs cannot pay.[204] This is in fact in line with the South African government's policy that funding of this nature is formally established.[205]

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[199] CCICED, "Special Study".
[200] European Commission, (2006), "Proposal for a Directive of the European Parliament and of the Council establishing a framework for the protection of soil and amending Directive 2004/35/EC", COM (2006) 232, Final, Brussels, 22 September 2006. The draft directive was sadly withdrawn in May 2014. See https://ec.europa.eu/environment/soil/index_en.htm. [Accessed on 13 December 2019.]
[201] European Commission, Press release, 13 February 2012.
[202] EPA, (2018), "Superfund: Transforming Communities – Accomplishments Report Fiscal year 2018". Available at https://semspub.epa.gov/work/HQ/100001884.pdf. [Accessed on 25 October 2019.]
[203] EPA, https://www.epa.gov/superfund/superfund-site-assessment-process. [Accessed on 5 February 2020.]
[204] Kidd (2009) *SAJELP*.
[205] Page 32 of the NWMS.

The government should be placed in a position to pay for rehabilitation because rehabilitating contaminated land can be excessively expensive.[206] Funding for potentially economically viable contaminated land should be catered for in legislation geared towards making such land economically viable again.

### 3.2.9. Financial incentives for pollution prevention and voluntary rehabilitation

The trend for managing contaminated land is moving from a "command and control" system where polluters are compelled and penalised, to a market-based approach.[207] This is seen in second-generation contaminated land laws which introduce fiscal measures to rehabilitate and utilise so-called "brownfield" sites and promote voluntary rehabilitation, where the first generation only identify and compel management and rehabilitation.[208] The USA's EPA describes "brownfield" sites as property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a contaminant.[209] There is a recognition that the traditional command and control approach is not always as effective as a market-driven approach.[210] One primary reason for this is that the costs and bureaucratically-long processes which normally accompany by regulation processes dis-incentivised people from taking on development projects involving contaminated land.[211]

There is a move in developed countries towards a market, incentive-based, approach to rehabilitating contaminated land. Both the UK and the USA has adopted brownfield financial incentive programs. The re-use of brownfield land have been a major policy objective in England since the late 1990s.[212] By 2015, the UK government made a commitment to get planning permission in place by 2020 for 90% of brownfield land

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[206] CLAIRE, (2010), "Contaminated Land Remediation", DEFRA Research Project Number SP1001. Available at http://sciencesearch.defra.gov.uk/Document.aspx?Document=SP1001_9957_FRP.pdf. [Accessed on 28 October 2019.]
[207] Brandon, "Domestic Site Contamination Law" at page 44.
[208] Brandon, "Domestic Site Contamination Law" at page 44.
[209] EPA at https://www.epa.gov/brownfields/overview-epas-brownfields-program). [Accessed on 28 October 2019.]
[210] Brandon, "Domestic Site Contamination Law" at page 182.
[211] Brandon, "Domestic Site Contamination Law" at page 182.
[212] Wong & Bäing, (2010), "Brownfield residential redevelopment in England. What happens to the most deprived neighbourhoods?", Joseph Rowntree Foundation. Available at https://www.jrf.org.uk/sites/default/files/jrf/migrated/files/brownfield-residential-redevelopment-full.pdf. [Accessed on 28 October 2019.]

suitable for housing.[213] The UK's Home Building Fund is one incentive funding mechanism to support development on brownfield land.[214]

The USA EPA's Brownfields Programme provides grants to fund environmental assessment, clean-up and redevelopment, and job training activities.[215] (By distinction, the EPA's Superfund program is responsible for cleaning up some of the USA's most egregious contaminated land and responding to environmental emergencies.[216]) The Brownfields Programme provides financial incentives, such as grants, for rehabilitation to make land economically viable again. These include "assessment grants" to cover environmental assessment and clean-up grants.[217] The programme has been successful by significantly reducing the number of properties in need of rehabilitation.[218] Since 2006, that program supported the clean-up of over 149 692 sites.[219]

Luo et al notes that a far greater barrier to re-using and redeveloping contaminated land can be the social, environmental and social context of the site.[220] They therefore recommended that financial incentives are introduced into China's new land contamination law to encourage re-development. Incentives should therefore fit in the socio-economic context of the country. There are many experiences from across the world, including the USA, which show that financial incentives for voluntary remediation are an important part of a contaminated land regime, particularly where domestic economic imperatives may render rehabilitation financially unviable or prohibitive.[221]

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[213] UK Department for Communities and Local Government, (2015), "Building more homes on brownfield land: Consultation proposals".
[214] https://homebuildingfund.campaign.gov.uk/. [Accessed on 28 October 2019.]
[215] EPA, (2015), "Anatomy of Brownfields Redevelopment". Available at https://www.epa.gov/sites/production/files/2015-08/documents/anat_bf_redev_101106.pdf. [Accessed on 5 September 2019.]
[216] See https://www.epa.gov/superfund. [Accessed on 28 October 2019.]
[217] See https://www.epa.gov/brownfields/types-brownfields-grant-funding. [Accessed on 29 October 2019.]
[218] EPA, (2005), "Investing in Partnership, Possibility and People: A Report to Stakeholders from the USEPA Brownfields Program", EPA Record No. 65165577 at pages 23 to 24; Brandon, "Domestic Site Contamination Law" at page 33.
[219] See https://www.epa.gov/brownfields/brownfields-program-accomplishments-and-benefits. [Accessed on 29 October 2019.]
[220] Luo Q et al (2009), "Risk-Based Management of Contaminated Land in the UK: Lessons for China?", *Journal of Environmental Management*, Volume 90 at page 1123.
[221] Brandon, "Domestic Site Contamination Law" at page 350.

This should be a financial incentive to undertake rehabilitation of, and use the land beneficially, or, a mechanism which allows PRPs to voluntarily rehabilitate the land for some other benefit, such as immunity from criminal or civil sanction. Adding an incentive for rehabilitating contaminated sites would not be at odds with South Africa's existing tax regime. Section 37B of the Income Tax Act[222] provides for the deduction of the tax payable, of the capital expenditure in respect of environmental treatment and recycling assets and environmental waste disposal assets.

Though this approach can also be effective to regulating contaminated land, the only concern is that it inadvertently causes the land to be rehabilitated to lower stands seemingly because is it voluntary.[223] This is a concern that the government should cater for in granting of incentives.

### 3.2.10. Regulatory process for site identification, investigation, assessment and rehabilitation

Contaminated land laws should contain legislated duties on land owners, occupiers and users to notify the relevant authority that land is potentially, or is contaminated. Some believe that contaminated land legislation is of very little value if it does not require contaminated land to be identified.[224] It is important that the duty to notify exists in the law as it then allows the authority with the relevant expertise to examine the land to determine the risk it presents to those potentially affected by it.

It is also important that the legislation sets out *when* the notification is to occur.[225] The legislation could require notification when there is a suspicion of contamination or actual knowledge of contamination or if human health is at risk.[226] The law should also clearly describe what "contamination" is and should provide that any powers to issue orders to take action are sufficiently wide to investigate and rehabilitate it.[227]

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[222] Act No. 58 of 1962.
[223] Brandon, "Domestic Site Contamination Law" at page 45.
[224] Berveling S, (2002), "Analysis of Australian Legislation Dealing with Contaminated Land", *Scientific World Journal*, Volume 2, page 1167 at paragraph 4.
[225] Berveling, *Scientific World Journal* at paragraph 3.
[226] Berveling, *Scientific World Journal* at paragraph 3.
[227] Berveling, *Scientific World Journal* at paragraph 3.

The law should also set out a clear process to investigate, assess and cause the rehabilitation of the land. This is to ensure that the relevant authority receives the information about the extent of the contamination, and which parcels of land require immediate attention. If this does not occur, political motivation to adequately address the problem may be lacking because environmental concerns may not be the priority at the time.[228] Contaminated land would be competing with other, more visible, environmental issues for political attention.[229] Also, the availability of information is crucial to address a risky environmental situation.

If there is a legislated system of ensuring the identification of contaminated sites, a national programme to prioritise the most contaminated sites can be developed. Furthermore, regulatory efforts to assess and order land rehabilitation is, at a first step, dependent on proper identification of contaminated land.

### 3.2.11. National contaminated sites register

There are compelling reasons for the establishment and maintenance of a contaminated land register and valid concerns about the manner in which it may be implemented. If the primary goal of contaminated land laws is to prevent harm to human health, then a national register makes sense because it facilitates transparency and awareness of risk. Furthermore, having the public access the register could motivate them to participate more in the decision-making processes, resulting in a more transparent and defensible process. A register may be important for the overall effectiveness of an entire national contaminated land regime. In Germany, there is no legislated requirement for a centralised national contaminated land register. This makes it difficult to determine the number of suspected contaminated sites and there are now efforts in Germany now to harmonise regional data to form a national database.[230]

The concerns about a publically available register include that it may have a negative impact on private property values not only of the contaminated property, but also

[228] Brandon, “Domestic Site Contamination Law” at page 373.
[229] Brandon, “Domestic Site Contamination Law” at page 373.
[230] Brandon, “Domestic Site Contamination Law” at page 160.

surrounding properties.[231] Section 143 of the UK's Environmental Protection Act introduced the requirement to maintain contaminated land registers. After wide-spread criticism from land-developers, banks and the property market industry, section 143 was repealed in 1995.[232] Contaminated land registers were reintroduced into the UK by enacting Part IIA of the Environmental Protection Act,[233] but those registers are now limited to sites issued with a remediation notice. This reform was done to alleviate the concerns about the social and financial effect of a list styled as a "contaminated land register".[234] The Australian Queensland Contaminated Land Act[235] has provisions for a register which resulted in a very comprehensive contaminated land register. The public did not understand the differences between the categories in that register and a stigma became attached to the properties on the register regardless of its category.[236] A contaminated land register can therefore harm an area's local economy by inadvertently discouraging business from operating in the area, if not legislated and managed properly.

These legislative elements have important bases for its inclusion in a contaminated land regime and its exclusion could be detrimental to achieving the identification, management and rehabilitation of contaminated land.

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[231] Brandon, "Domestic Site Contamination Law" at page 327.
[232] By section 120(1) and (3) of the Environment Act, 1995 (1995 c. 25).
[233] Introduced by section 57 of the Environment Act, 1995 (1995 c. 25).
[234] Syms P & Simons R, (1999), "Contaminated land registers: an analysis of the UK and USA approaches to public management of contaminated sites", *Land Contamination and Reclamation*, Volume 7 No. 2.
[235] No. 96 of 1991.
[236] Berveling S, *Scientific World Journal* at paragraph 6.

# Chapter 4 South Africa's contaminated land regime under Part 8 of the Waste Act

## 4.1 Legislation and Policy prior to Part 8

It took South Africa almost 20 years since its first substantive environmental legislation, ECA, to legislate a contaminated land regime. Whilst ECA did regulate contaminated land insofar as it required authorisation for waste disposal sites and authorisation for other hazardous listed activities, it did not contain any provisions which regulated the soil contamination aspects related thereto, nor did it regulate soil contamination more broadly. The NWA also regulated contaminated land with the section 21(g) and (h) water use licences which controlled the contamination of areas underlying waste disposal sites. As such, the NWA's focus was on regulating contaminated ground and surface water as a result of runoff. It was not on soil contamination per se.

The White Paper on Environmental Management Policy, published in 1997 (the "White Paper"), broadly addressed pollution as a concept.[237] One of its goals is to prevent, reduce and control environmental pollution from all forms of human activity, including from hazardous substances, and to protect and manage human health problems related to the environment.[238] The White Paper culminated in the enactment of the National Environmental Management Act[239] in 1998 ("NEMA").

NEMA was enacted as framework legislation to govern environmental management in South Africa. Section 2 of NEMA sets out principles which apply to organs of state's actions which significantly affect the environment.[240] Those principles requires that development must be socially, environmentally and economically sustainable[241] by considering all relevant factors including that pollution and degradation of the environment is avoided, or where this is not possible, is minimised and remedied.[242] These principles also apply to government decisions pertaining to land contamination.

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[237] Government Notice 1096 in Government Gazette 18164 dated 28 July 1997.
[238] "Goal 2: Sustainable Resource Use and Impact Management".
[239] Act 107 of 1998.
[240] Section 2(1) of NEMA.
[241] Section 2(3) of NEMA.
[242] Section 2(4)(a)(ii) of NEMA.

NEMA also declares that the costs of remedying pollution and its consequent adverse health effects must be paid for by those responsible for harming the environment.[243]

The formulation towards a dedicated contaminated land regime took shape with the White Paper on Integrated Pollution and Land Management (the "IP&WM White Paper") in March 2000.[244] The IP&WM White Paper recognises land as one of three receiving media and states that the government will ensure the integrity and sustained fitness for use of that media.[245] It was the first time that separate recognition had been given in a government policy to soil pollution. Whilst it deals with this mostly in the context of landfills, it gives due reference to other sources of land contamination. Section 3.3 of that policy deals issues arising from land pollution. It states that waste disposal sites, especially those containing hazardous, medical, and veterinarian waste, may result in land contamination.

The IP&WM White Paper also states that the government will adopt a functional approach to integrated pollution and waste management.[246] This includes managing the receiving environment which entails anticipating threats to environmental media and remediation would entails retrospective intervention to reverse environmental damage.[247] These policy prescriptions laid the foundation for enacting a dedicated contaminated land regime.

### 4.2. Part 8 of the Waste Act

The Waste Act came into operation on 1 July 2009 as the primary law dedicated to regulating waste management in South Africa. Certain parts of the Act did not immediately come into operation including Part 8 dedicated to contaminated land, and which only came into operation on 2 May 2014.[248] The delayed implementation of Part 8 was because regulations and norms and standards required for its implementation was not ready.

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[243] Section 2(4)(p) of NEMA.
[244] Government Notice No. 227 of Government Gazette 20978 dated 17 March 2000.
[245] Paragraph 1.4 of the IP&WM White Paper.
[246] Paragraph 4.2.5 of the IP&WM White Paper.
[247] Paragraph 4.2.5 of the IP&WM White Paper.
[248] Proclamation 26 of 2014 in Government Gazette 37547 dated 11 April 2014.

### 4.2.1. Definitions and application

For purposes of Part 8, “contaminated” is defined to mean the presence in or under any land or structures of a substance or micro-organism above the concentration that is normally present in or under that land, which may directly or indirectly adversely affect the quality of soil or the environment.[249]

Part 8 applies retrospectively in that its provisions apply even if the contamination occurred before the commencement of the Waste Act, arose or is likely to arise at a different time from the actual activity that caused the contamination, arose through an activity that results in a change to pre-existing contamination, or even if the contamination originated from land that has been declared contaminated through section 38.[250]

### 4.2.2. Identification and Notification of Investigation Areas

Part 8 then sets out a land identification process in section 36(1) to which Part 8 applies.[251] It empowers the Minister or an MEC[252] to identify an “investigation area”[253] by publication in the Gazette, if: (1) it’s land on which high-risk activities have taken place or are taking place that are likely to result in land contamination;[254] or (2) land that the Minister or MEC believes, on reasonable grounds, to be contaminated.[255] This identification must be preceded by two mandatory consultation processes: firstly, with the Minister responsible for water affairs and forestry and “any other organ of state concerned”,[256] and secondly, by following a consultation process set out in sections 72 and 73 of the Waste Act.[257] Sections 36(1) and (3) does not expressly require two consultation processes, but reading the provision leads to this conclusion.

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[249] Section 1 of the Waste Act.
[250] Section 35 of the Waste Act.
[251] Section 36(1).
[252] Defined in the Waste Act as a member of the Executive Council of Province who is responsible for waste management in that province.
[253] Section 36(1).
[254] Section 36(1)(a).
[255] Section 36(1)(b).
[256] Section 36(1).
[257] Section 36(3).

Collectively, sections 72 and 73 of the Waste Act sets out a comprehensive consultation process. The Minister must, among others, consult with all Cabinet members,[258] and the MEC responsible for waste management in each province affected by the declaration.[259] A similar process is provided for MECs in section 73.

Section 73 requires the proposed declaration to be published in the relevant Government Gazette[260] and in at least one newspaper distributed nationally and a local newspaper if the act will only affect a specific area.[261] The Gazette notice must call for public comments within no less than 30 days of publication in the Gazette and contain sufficient information to enable the public to comment.[262]

Section 36(5) obliges a landowner whose land is significantly contaminated, or a person whose activity caused the land to be significantly contaminated to notify the Minister and MEC of that contamination as soon as that person becomes aware of that contamination.[263] The Act does not define "significant" nor does it provide any guidance for such determination.

Section 36(6) then states that despite section 36(1), the Minister or an MEC may issue a notice to a specific person identifying land as an investigation area if they have reasonable grounds to believe that the land is or is likely to be contaminated. The section 36(6) declaration seems to be intended to provide the option of an expedited process and remove the requirement to consult, as required by sections 36(1) and (3), prior to an investigation area declaration. Notably, this section does not require the contamination to be "significant".

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[258] Section 72(2)(a).
[259] Section 72(2)(b).
[260] The national Government Gazette in respect of the Minister and the Provincial Gazette in respect of the MEC.
[261] Section 73(1)(b).
[262] Section 73(a) and (b).
[263] Section 36(5).

### 4.2.3. Site Assessment Reports

Section 37 requires the development of a site assessment report for an identified investigation area. The power to require the assessment is divided in two parts in section 37 (section 37(1)(a) and section 37(1)(b)).

In section 37(1)(a), the Minister or MEC may require the state to do a site assessment. The decision to undertake the assessment, according to the text of section 37, can only be undertaken after a further consultation with the minister for water affairs and forestry, remembering that a section 36(1) investigation area declaration can only be done after consulting the minister for water and forestry. That minister must be consulted before declaring the investigation area and before requiring an assessment, when reading Part 8.

Section 37(1)(b) states that, also only after consulting the minister for water affairs and forestry, the Minister of MEC may, in the section 36(1) or section 36(6) investigation area notice itself, direct the landowner or the person who has undertaken the high-risk activity or who may has caused contamination of the investigation area, to conduct a site assessment by an independent person, and to submit a site assessment report to the Minister or MEC within a period specified in the notice.

A site assessment report must comply with any directions that may have been published or given by the Minister or MEC in the sections 36(1) or 36(6) notice and must at least include information on whether the investigation area is contaminated.[264] At this stage, only draft regulations for site assessment reports have been published.[265]

Where a site assessment report concludes that the investigation area is contaminated, the site assessment report must contain information on whether:

- the contamination has already impacted on human health or the environment;
- the substances present in or on the land are toxic, persistent or bio-accumulative or are present in large quantities or high concentrations or occur in combinations;

[264] Section 37(2)(a)
[265] Draft Regulations for Assessments and Reports, Government Notice 234 of Government Gazette 35161 dated 12 March 2012.

- there are exposure pathways available to the substances;
- the use or proposed use of the land and adjoining land increases or is likely to increase the risk to health or the environment;
- the substances have migrated or are likely to migrate from the land;
- the acceptable exposure for human and environmental receptors in that environment have been exceeded;
- any applicable standards have been exceeded; and
- the area should be remediated or any other measures should be taken to manage or neutralise the risk.[266]

Section 37 then states that land may be regarded as being contaminated at any time if the risk of harm to health or the environment could eventuate only in certain circumstances and those circumstances do not exist at the time that the site assessment is undertaken, but those circumstances are reasonably foreseeable.[267] This consideration is relevant as it suggests that, even if there is no pathway or receptor for the contamination at the time of its assessment, if there is a future likelihood of such pathway and receptor eventuating, then the land may be regarded as contaminated.

### 4.2.4. Remediation Orders and Monitoring and Management Orders

Part 8 states that the Minister or MEC must, after receiving the site assessment report, "decide" that the area is either:

- contaminated, presents a risk to health or the environment, and must therefore be remediated urgently; or
- contaminated, presents a risk to health or the environment, and must be remediated within a specified period; or
- contaminated but does not present an immediate risk, and measures are required to address the monitoring and management of that risk; or

[266] Section 37(2)(b)(i) to (viii).
[267] Section 37(3).

- is not contaminated.[268]

Where it's concluded that the contamination presents a risk to health or the environment and remediation is urgently required or required within a specified period, the Minister or MEC must declare the land a remediation site and make a "remediation order" that will "neutralise the risk".[269] Part 8 doesn't specify who may be the recipient of a remediation order. In theory, it could be anyone, and not necessarily limited to the persons listed in section 37(1)(b). Where it's concluded that it does not present an immediate risk, but that measures are required to monitor and manage the risk, the Minister or MEC may order the measures that are taken.[270] For convenience, this order will be referred to as a "monitoring and management order".

All of these measures are to be undertaken at the cost of the directive (section 37(1)) or order's recipient but the Act implies that the Minister or MEC may direct liability for the costs of the remediation or management measures at another person.[271]

The Minister or MEC may amend a remediation order if ownership of the land is transferred and the new owner accepts responsibility for the remediation in writing, or new information or evidence warrants amending the order.[272]

Section 39 then prescribes what information a remediation order as well as a monitoring and management order must contain:

- the person responsible for the remediation;
- the land to which the order applies;
- the nature of the contamination;
- the remediation measures or standards;
- the period that the order must be complied with;
- whether any land-use limitations are imposed;

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[268] Section 38(1)(a) to (d).
[269] Section 38(2).
[270] Section 38(3).
[271] Section 38(4).
[272] Section 38(5).

- measures to monitor or manage the risk; and
- any other prescribed matter.[273]

To date, nothing has been prescribed in the form of regulations as to the content of a remediation order or monitoring and management order.

Section 39 however provides, again, that before a remediation order may be issued or amended, the Minister or MEC must consult the minister for water affairs and forestry as well as "any other organ of state concerned".[274]

### 4.2.5. Transfer of Remediation Sites

Section 40 of Part 8 deals with transferring contaminated land. It states that no person may transfer contaminated land without informing the transferee that the land is contaminated and, in the case of a declared remediation site, without notifying the Minister or MEC and complying with any conditions that they may specify.[275] The word "transfer" is not defined but given the context, it should mean ownership. The Act then requires that the Minister must notify the relevant Registrar of Deeds of any land declared as a remediation site.[276] The notification must identify the land sufficiently to enable the Registrar to record the necessary information in the property registry.[277]

### 4.2.6. Contaminated Land Register

Finally, section 41 deals with the contaminated land register. It requires the Minister to keep a national contaminated land register of "investigation areas".[278] The register must include information about:

- the owners and any users of investigation areas;
- the location of investigation areas;
- the nature and origin of the contamination;

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[273] Section 39(1)(a) to (h).
[274] Section 39(2).
[275] Section 40(1).
[276] Section 40(2)(a).
[277] Section 40(2)(b).
[278] Section 41(1).

- whether an investigation area is contaminated or not, the risk it poses to health or the environment, and the nature of management or remediation required;
- the status of remediation activities on investigation areas; and
- land use restrictions on investigation areas.[279]

The Minister may amend the status of an investigation area on the register if a remediation order is complied with or other circumstances justify the change.[280] The section finally states that an MEC must provide information about investigation areas they've declared to the Minister to record in the register.[281]

Part 8 comprises of these provisions, while its implementation is theoretically supported the instruments discussed above.

At the time of the writing of this dissertation, the National Environmental Management Laws Amendment Bill[282] (the "NEMLA Bill") was already introduced in Parliament. That Bill proposes amendments to Part 8. The value of some proposed amendments are also discussed below as part of this dissertation.

### 4.3. Part 8: Regulations, Norms and Standards, and Guidelines

To date, little final subordinate legislation has been published to clarify and give effect to Part 8. This section briefly lists those instruments which are either in draft or final form.

#### 4.3.1 Framework for the Management of Contaminated Land

The Framework for the Management of Contaminated Land, 2010 ("Framework for Contaminated Land") published prior to Part 8 coming into force.[283] The Framework for Contaminated Land states that it was published to provide norms and standards to enable the identification and registration of contaminated sites, provide a risk-based

[279] Section 41(1)(a) to (f).
[280] Section 41(2).
[281] Section 41(3).
[282] Bill B14D of 2017. Available at https://pmg.org.za/bill/706/. [Accessed on 19 November 2019.]
[283] DEFF, (2010), "Framework for the Management of Contaminated Land", at page 7.

decision-support protocol for assessing sites, and provide guidelines for submitting site assessment reports.[284] It also states that it provides national norms and standards for implementing remediation activities contemplated in section 7(2)(d) of the Waste Act.[285]

The Framework for Contaminated Land sets out the following standards:

- A Protocol for Site Risk Assessment
- Reporting Norms and Standards for Contaminated Land;
- The Derivation and Use of Soil Screening Values;
- Application of Site Specific Risk Assessment; and
- Quality Control and Quality Assurance of Field Sampling and Laboratory Analysis.[286]

The Framework for Contaminated Land does not amount to subordinate legislation though. It is largely a technical document which prescribes scientific and technical standards and methods for obtaining and reporting contaminated land information in terms of Part 8. This is not surprising as determining the human and ecological risk of contaminated land is a highly technical and complicated matter.[287] As part of its Protocol for Site Risk Assessment, for example, it sets out a scientific methodology for the screening of soil.[288]

### 4.3.2. National Waste Management Strategy

In November 2011, DEFF published the National Waste Management Strategy (the "NWMS").[289] The NWMS's first objective for contaminated land is to quantify the extent of contaminated land caused by current and past high-risk activities in terms of its geographical extent and in terms of financial liability, in order to secure adequate funding for remediation.[290] The NWMS states that the contaminated land register will

[284] Preface to the Framework for Contaminated Land.
[285] Section 7(2)(d) empowers the Minister to publish norms and standards for the remediation of contaminated land and soil.
[286] DEFF, "Framework for Contaminated Land" at page 9.
[287] Mohd et al, (2013), "Soil Contamination, Risk Assessment and Remediation", *Environmental Risk Assessment of Soil Contamination*, Edited by Hernandez-Soriano M, IntechOpen.
[288] DEFF, "Framework for Contaminated Land" at pages 10 to 12.
[289] Government Notice 344 in Government Gazette 35306 dated 4 May 2012.
[290] Goal 7 on page 32 of the NWMS.

be the primary instrument for this.[291] The second objective is to prepare remediation plans for contaminated land.[292] It is therefore descriptive in nature and doesn't clarify the contents of Part 8 or related processes.

The NWMS states that regulations will be promulgated for Part 8, which will require landowners to do site assessments where high-risk activities have taken place.[293] No such regulations have however promulgated thus far.

The NWMS also states that norms and standards will be adopted to define what constitutes contamination, and what is required for remediation.[294] This has partially, albeit incompletely, been realised in the Norms and Standards for the Remediation of Contaminated Land (discussed below). The NWMS provides guidelines will be issued regarding the contaminated land register and its implications for affected industries, and will describe the responsibilities of stakeholders including contaminated landowners, financial institutions and property developers.[295] These guidelines have also not been published yet.

The NWMS also states that DEFF will assess the extent of the state's liability in terms of remediation so that appropriate funding arrangements in terms of a "National Remediation Fund" can be negotiated with the National Treasury.[296] Not only has this not been done, but there is no empowering provision in the Waste Act for such a fund.

### 4.3.3. Draft Regulations for Site Assessments and Reports

In March 2012, the Draft Regulations for Site Assessments and Reports were published.[297] These regulations have however never been finalised and promulgated as subordinate legislation. In its absence, the Minister is required to specify what information, on a case by case basis, the reports should contain. For completeness, it would be useful to highlight relevant parts of its contents.

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[291] Goal 7 of the NWMS.
[292] Goal 7 of the NWMS.
[293] Goal 7 of the NWMS.
[294] Goal 7 of the NWMS.
[295] Goal 7 of the NWMS.
[296] Goal 7 of the NWMS.
[297] In Government Notice 234 of *Government Gazette* 35161 dated 19 March 2012.

The stated purpose of the Draft Regulations for Site Assessments and Reports was to regulate site assessment reports in section 37 in Part 8 and who may conduct site assessments. The draft regulations required that only a suitably qualified person may conduct a site assessment and that if the landowner is not able to conduct a site assessment in compliance with the regulations, the Minister or MEC may appoint an independent, suitably qualified person to do so and recover the costs from the landowner.[298] The draft regulations also prescribe a public participation process[299] prior to submitting the assessment to the Minister or MEC[300] and creates offences and penalties for non-compliance with the regulations.[301] It is not clear why these draft regulations were not finalised and promulgated as they contain some useful measures.

### 4.3.4. National Norms and Standards for the Remediation of Contaminated Land and Soil Quality

In May 2014, the National Norms and Standards for the Remediation of Contaminated Land and Soil Quality[302] ("Part 8 Norms and Standards") were published. The purpose of those norms and standards is to provide a uniform approach to determining an investigation area's contamination status, give guidance about the criteria and method to assess contaminated land, and provide minimum standards to assess environmental protection measures for remediation activities.[303] The Part 8 Norms and Standards also set norms and standards which must be used for screening a site for certain substances after a site assessment report is required after its declared an investigation area.[304]

These instruments represent the contaminated land regime under the Waste Act with Part 8 as the primary part of that regime. The chapter which follows considers whether it adequately addresses the best-practice legislative elements recommended by scholars and studies.

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[298] Draft regulation 4(2) of the Draft Regulations for Site Assessments and Reports.
[299] Draft regulation 5 of the Draft Regulations for Site Assessments and Reports.
[300] Draft regulations 6 and 7 of the Draft Regulations for Site Assessments and Reports
[301] Draft regulation 8 of the Draft Regulations for Site Assessments and Reports.
[302] Government Notice 331 in *Government Gazette* 37603 dated 2 May 2014.
[303] Section 2 of the Part 8 Norms and Standards.
[304] Section 4(1) of the Part 8 Norms and Standards.

# Chapter 5 Analysis of Part 8 of the Waste Act against best-practice legislative elements

This chapter sets out a critical analysis of South Africa's contaminated land regime against the best-practice legislative elements discussed earlier. The goal is to propose regime reforms, if needed, to better enable the identification, management and rehabilitation of contaminated land.

## 5.1 The polluter-pays principle

Section 38(4) of Part 8 states that unless otherwise directed, a remediation order, a monitoring and management order and a section 37(1)(b) directive, must be complied with at the cost of the recipient of those notices. The orders and directives can be issued against a wide array of parties who are not the primary polluter like other PRPs. On the face of it, therefore, Part 8 does require that the polluter pays for the pollution.

However, the legislative leeway of "[u]nless otherwise directed" in the introduction of section 38(4) creates uncertainty which could lead to those orders being legally challenged, based on its vagueness. The problem is that even though section 37(1)(b) directives can be issued against parties identified in the provision (landowner or the person undertaking a high-risk activity which caused or may cause contamination), the introduction to section 38(4) suggests that the order and directive's compliance costs could be paid for by some other party not identified in the empowering provision (section 38(4)). Part 8 steers away from empowering the Minister or MEC to issue orders against certain identified class of parties, like CERCLA for example. Sections 38(2) and (3) is silent on the issue seemingly with the intention not to limit the scope of PRPs.

Section 38(5) then prescribes that the Minister or MEC may amend a remediation order if ownership of the land is transferred and the new owner assumes responsibility for the remediation in writing. What then is the consequence if the new owner does not "assume" responsibility for the contamination in writing? Again, Part 8 is silent on this issue. This suggests that the government will still pursue the seller of the land to pay for its rehabilitation. It seems that this is to prevent landowners from selling-off contaminated land to unknowing buyers, but it's not clear.

Chapter 3 suggested incorporating other mechanisms in Part 8 to obtain financial relief from a polluter recovering costs from PRPs is a challenge. The argument here does not conflict with suggestions in the discussion on joint and several liability in that while joint and several liability relies on PRPs to work out the apportionment of liability among themselves, it has its limitations in that parties may not always be willing to do so. Parties may be more amendable to out-of-court settlements if it was apparent from the legislation that one PRP's chances of success in a court battle against another PRP, was reasonable. Part 8 could include an express provision which not only empowers one party to sue another PRP to recover the contributory costs but contain innovative provisions to help parties settle their disputes out of court. For example, Part 8 could empower a court to impose a legal costs order against a PRP litigant where the court's view is that the litigant unreasonably persisted with litigation despite reasonable settlement offers by other PRPs.

### 5.2 The identification of the potential responsible party

The first mechanism in Part 8 to identify PRPs is the duty imposed on an owner of land that is significantly contaminated, or a person whose activity caused significant contamination, to notify the Minister and MEC of that contamination as soon as that person becomes aware of that contamination.[305] It's an offence in terms of section 67(1)(b) of the Waste Act for failing to comply with the duty.[306] This mechanism is compels the public to notify the government of contaminated land so that preventative or rehabilitative work can be undertaken. However, certain aspects of this notification mechanism does raise some concerns:

- A PRP could be reluctant to notify the government if there is a possibility that the PRP may be prosecuted for the contamination. Section 60(7) of the New South Wales Contaminated Land Management Act[307] states that information provided by a person to comply with a similar duty is not admissible as evidence in any

[305] Section 36(5).
[306] Section 68(2) of the Act contains the penalties, which is not relevant to this discussion.
[307] Act 140 of 1997.

proceedings against that person. This mechanism removes the threat of prosecution and would make it easier for a PRP to report the contamination.

- Section 36(5) is unclear about *when* a person must notify the government of significant contamination since it is practically and legally insufficient to require notification "as soon as that person becomes aware". The duty only also applies to "significantly" contaminated land. Average persons would be unaware that land is contaminated and equally unaware that land is significantly contaminated. The duty would really only work for land which is visibly contaminated or where contamination has been confirmed through testing. Kidd points out, with reference to *Hichange Investments (Pty) Ltd v Cape Produce Co (Pty) Ltd*,[308] that contamination ought to be significant for Part 8 to be applicable but that significance may be not raise the bar very high.[309] By contrast, section 60(5) of the New South Wales Contaminated Land Management Act states that a person is taken to be aware of contamination if the person ought reasonably to have been aware of the contamination. This could be included in Part 8 to cure a PRP's defence that they didn't know that the land was significantly contaminated. The NEMLA Bill proposes to amend section 36(5) to remove "significantly" so it reads, "An owner of land that is *likely* to be contaminated…must notify…" (own emphasis).[310] This may not resolve the concerns raised in this paragraph since the question arises how the owner is to know the land is "likely to be contaminated" unless it is visibly contaminated or tested for contamination. The proposed amendment would also expand the duty's applicability to contamination that is not as serious because it would apply to any land which is likely to be contaminated and not "significantly contaminated". Furthermore, the Bill proposed to leave the rest of section 36(5) the same resulting in the duty still applying to persons whose actions causes significant contamination. The landowner's duty is different to the party whose actions may cause significant contamination. NEMA's duty of care obliges parties to investigate actions which

[308] *Hichange Investments (Pty) Ltd v Cape Produce Co (Pty) Ltd t/a Pelts Products and others* 2004 (2) SA 393 (E).
[309] Kidd (2009) *SAJELP* at page 10.
[310] See section 64 of the NEMLA Bill.

> may cause significant pollution so that the duty to minimise or avoid those impacts can be undertaken.[311] The parties would then have foreknowledge of the impacts of their acts based on those investigations and that knowledge would trigger the duty to notify under section 36(5) in Part 8. However, it is cumbersome and messy to impose such duties across different statutes. There is no easy manner to legislate a duty of this nature. A balance needs to be struck between avoiding the trivial and capturing the serious. Kidd's proposal, by following the New South Wales Contaminated Land Management Act,[312] that guidance for what is "significantly contaminated" be set out in guidelines by the relevant enforcement agency, is a helpful one. The same approach has seemingly been poorly followed in South Africa with the publication of the Part 8 Norms and Standards because those standards do not provide any guidance on what is "contaminated" or "significantly contaminated" for purposes of Part 8.[313]

Furthermore, Part 8 empowers the Minister or MEC to make one of four orders based on a site assessment.[314] Section 38(2) allows the issuing of a remediation order "as is necessary to neutralise that risk", which order must describe the person who is responsible for the remediation.[315] The power to order a site assessment (sections 37(1)(b)(i) and (ii)) at least articulates certain PRPs, but the provision empowering the remediation order simply states that the PRP must be identified without properly legislating against who an order may be issued, leaving an order open to judicial challenge for vagueness of the empowering legislation.

In addition, section 38(4) confirms an order's recipient must pay for the costs of compliance, Part 8 does not set out which PRPs may be held liable. It is, at the very least, not articulated clearly. Again, the clear and precise legislative articulation of who may be held liable for rehabilitation costs is critically important because if liability is not legislated properly, PRPs may escape liability. CERCLA, for example, sets out four

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311 Section 28(1) of NEMA.
312 No. 140 of 1997.
313 Kidd (2009) *SAJELP* at page 11.
314 Section 38(1).
315 Section 39(1)(a).

classes of PRPs,[316] while the New South Wales Contaminated Land Management Act has a section dealing with different levels of liability among PRPs.[317] For example, a person is a PRP if the contamination occurred because an act or activity of that person resulted in the conversion of a substance that did not cause contamination of the land into a substance that did cause contamination of the land.[318]

It is recommended that Part 8 has a provision which sets out circumstances where persons are regarded as a PRP. Furthermore, the Act could provide the Minister with the power to prescribe circumstances which would deem a person a PRP.[319]

### 5.3 The application of joint and several liability

Part 8 does not expressly provide for joint and several liability among PRPs. Since Part 8 does not set out which persons may be identified as PRPs, there is a consequential gap in that it does not set out a legislative mechanism to allow the government to make liability among PRPs joint and several. Without the law empowering this, it is difficult to see how the government can justify a remediation order wherein they impose liability jointly and severally among PRPs. For instance, if the government were to order that three PRPs are to rehabilitate contaminated land, on what lawful basis would the government hold the three PRPs jointly and severally liable? The government simply cannot order that they are jointly and severally liable if they are not legislatively empowered to do so.[320] If the government were to order joint and several liability, that order may be judicially set aside on the basis that the government is not expressly authorised in Part 8 to issue a remediation order of that nature. It seems that the only way in which this could be done is to issue each PRP with their own individual remediation order, which would lead them to raise the defence that other PRPs are also liable and that liability should be apportioned. This would

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[316] USC sections 9607(a)(1) to (4).
[317] Section 6 of the New South Wales Contaminated Land Management Act.
[318] Section 6(1)(b) of the New South Wales Contaminated Land Management Act
[319] For example, “The Minister may prescribe additional circumstances which qualify any person as responsible for land contaminated in terms of section 37 of the Act”.
[320] Based on the understanding of South Africa’s constitutional democracy that government cannot assume any power not conferred on them by the Constitution (section 41) and in turn, by legislation. This is also enforced through section 6 of PAJA.

cause delays in rehabilitating the land. Part 8 could incorporate a provision as in Canada where British Columbia's Environmental Management Act[321] states that **"**[a] person…responsible for remediation…is absolutely, retroactively and jointly and separately liable to any person or government body for reasonably incurred costs of remediation...'.[322]

As discussed elsewhere, the legislation could also be reformed to discourage unreasonable litigation among PRPs to avoid liability, in the form of a court-imposed legal costs order against unreasonable PRP litigants.

### 5.4 The retrospectivity of the regime

The Constitution's prohibition against a conviction for a historical act which was not a crime at the time does not prevent civil recourse for those acts.

Part 8 applies to land contamination even if the contamination occurred before the Waste Act.[323] Earlier, it was suggested that a balanced approach is taken to retrospective liability as may be nuances in the circumstances surrounding historic contamination. For example, the PRP acted in accordance with the law at the time and in doing so created many jobs, but unfortunately, also caused pollution. Section 25(3) of Western Australia's Contaminated Sites Act[324] states, for example, that a person who caused or contributed to land contamination before the Act's commencement is responsible for site remediation only to the extent that the person caused the contamination by an unlawful act. This may be a helpful reform for Part 8 but it would require extensive debate given it would be controversial.

Part 8 does not exempt historic polluters, irrespective of the circumstances surrounding their pollution acts. This study does not advocate for the exemption of historic polluters from liability. Rather, it proposes a balanced approach that, as will be shown, is more constitutionally palatable and consistent with other liability schemes in South Africa. Under Part 8, a company can be criminally sanctioned for historic land contamination

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[321] SBC 2003, c 53.
[322] Section 47(1).
[323] Section 35(a).
[324] Act 60 of 2003.

even if that company acted lawfully at the time that it undertook the pollution activity.[325] It could be argued that the unlawful act in that case is the failure to comply with the remediation order and that is not retrospective criminal sanction of a previously lawful act. This could be seen as a technically superficial legal argument because the historic act was still lawful when it was done. This may still be unconstitutional.[326] This relates to criminal conviction only as nothing bars the legislature from retrospectively making parties civilly liable for historic pollution acts.

In addition to its current scheme, Part 8 could integrate part of section 28 of NEMA's scheme where a duty is imposed on polluters to minimise, prevent and rectify significant pollution and the government is then given a legislative act of recourse to rehabilitate if the polluter fails to do so and recover the costs from the polluter.[327] A similar scheme is also enacted in section 19 of the Water Act for water pollution.

Based on the above discussion, these options arise by way of reform.

- Part 8 should be drafted in more clear terms where it states that it will not criminally sanction historic lawfully authorised acts of pollution; and
- a person may be held liable for historic lawfully authorised pollution acts but various factors will be considered to determine the PRP's level of liability. These could include—
    - whether the pollution acts were lawful, and whether all permit conditions were complied with, if applicable;
    - the good faith of the party;
    - the manner in which the party undertook its business in that they gave due care not to unnecessarily pollute the environment;
    - the economic benefit the PRP received from the pollution act;
    - the socio-economic benefits of the pollution act to society; and

[325] The criminal offences are cited in sections 67(1)(a) and (g) of the Waste Act.
[326] Section 45(3)(l) of the Constitution of the Republic of South Africa, 1996.
[327] Sections 28(8), (9), (10) and (11).

- the nature of the contamination.

### 5.5 Strict liability

Part 8 imposes strict liability in that it empowers the Minister or MEC to issue a remediation order to neutralise a risk and states that the rehabilitative steps required in the order must be paid for by the order's recipient.[328] The Minister or MEC only has to reach the conclusion that contamination has occurred and it presents a risk which authorises the power to issue a remediation order.

It is however recommended that the strict liability regime in Part 8 is strengthened. This can be done by articulating that the recipient of a remediation order is strictly liable for the cost of rehabilitation so as to avoid doubt.

### 5.6 Public participation in the decision-making process

Part 8 suffers from both over-consultation and incorrectly placed consultation requirements. It contains some useful consultation steps but there are others which are problematic.

Before publishing a notice in the Government Gazette identifying an investigation area, the Minister or MEC must consult the minister for water affairs and forestry and any other organ of state concerned, and before publishing that notice, they must follow the process set out in the Act.[329] That public participation process requires consulting all affected cabinet members and MECs, publication of the draft identification notice in the Government Gazette and publish a newspaper notice in at least one newspaper distributed in the area of the land in question.[330] Both the draft Gazette notice and the newspaper notice must invite the public to provide comments to the Minister or MEC within 30 days and "contain sufficient information to enable…the public to submit representations…".[331]

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[328] Section 38(4).
[329] Section 36 read with sections 72 and 73.
[330] Sections 72 and 73.
[331] Section 73(2).

This process is too onerous to simply identify an investigation area. Identifying an investigation area does not have any practical consequences for the public that justifies such a fully-fledged consultation process. It also seems impractical to require that a Government Gazette notice and a newspaper advert contain such detailed information that would enable the public to meaningfully comment on whether land should be investigated or not. The impracticalities of cumbersome legislated public consultation requirements of this nature was highlighted in *Kruger and Another v Minister of Water And Environmental Affairs and Others*[332] where the court found that that Minister had not complied with almost identical provisions in NEMBA. Even though the Minister was found to have consulted the public in several forms, the court found Minister did not meet the cumbersome consultation requirements in that Act.[333] The *Kruger* case highlights the consequences of legislating a detailed, rigid and cumbersome consultation process. The practicalities of sections 72 and 73 is that only after a draft investigation area notice is published in the Gazette and in a newspaper, and only after the government has considered and prepared responses to each public comment received as a result, may the Minister or MEC actually identify an investigation area, again by publishing a gazette notice.[334] Additionally, while not generally known, each government department is responsible for actually paying the Government Printing Works for publishing gazette notices from their own funds with costs of up to R1000 per page.[335] Cumulatively, this seems unnecessarily burdensome to simply identify investigation areas.

After identifying an investigation area, the poor drafting of Part 8 then requires the Minister and MEC to consult the minister for water affairs and forestry again before requiring a site assessment.[336] Therefore, Part 8 requires a full public consultation process to identify a site as an investigation area and then another consultation process

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[332] [2016] 1 All SA 565 (GP).
[333] Act No. 10 of 2004.
[334] Section 36(1).
[335] See http://www.gpwonline.co.za/Gazettes/Pages/default.aspx. At present, it cost R1008,80 per page to publish in the Government Gazette. [Accessed on 29 August 2019.]
[336] Section 37(1).

with the minister for water affairs and forestry prior to requiring a site assessment. This should be simplified.

Prior to deciding if the land is contaminated based on the site assessment, the Minister or MEC must again consult the minister for water affairs and forestry.[337] No public consultation is required for the Minister or MEC to "make" a remediation order or "make" a monitoring and management order,[338] but it does require another consultation with the minister for water affairs and forestry and any affected organs of state prior to "issuing a remediation order".[339] There is a conflict in terminology and process between sections 38(2) and (3), and section 39(2). Again, this leaves orders issued in terms of these provisions legally vulnerable as the law is unclear.

Part 8 does not require public consultation in the intermediary steps before the issuing of a remediation, or a monitoring and management order as is the preferred best-practice internationally.[340] Part 8 should require public consultation on site assessment reports, identified risks and proposed risk management measures, and anticipated impacts if the measures are not implement. The public must be made to be part of the decision-making process leading up the final order. This would assist the public to monitor if the orders are complied with by its recipient because the public will have been involved in the process before the final decision.

The Draft Regulations for Site Assessments and Reports were not finalised at the time of preparing this dissertation. Those draft regulations did prescribe a public participation process[341] prior to submitting site assessment reports to the Minister or MEC for final approval.[342] Those draft regulations require public meetings and recording the comments received, notifying the public of reports submitted to the Minister or MEC and of their final decision on reports.[343] These regulations should be

[337] Section 38(1).
[338] Sections 38(2) and (3).
[339] Section 39(2).
[340] See Chapter 3.
[341] Draft regulation 5.
[342] Draft regulations 6 and 7.
[343] Draft regulations 5, 6 and 7.

finalised and implemented to provide a more meaningful Part 8 public participation process that involves the public participating in the intermediary steps.

### 5.7 Fairness and equity

As stated earlier, CERCLA's mechanism that allows the EPA to negotiate settlements with PRPs whenever practicable and in the public's interest to expedite remedial actions and minimise litigation is one example of a mechanism to create an overall sense of fairness. It allows the EPA to require more contributions in a negotiation with a polluter who contributed proportionately more to the contamination.

Part 8's primary tools are remediation orders and monitoring and management orders. It only prescribes that these orders must identify against whom they are issued[344] and provides no other tools beyond identifying its recipient. Section 39(1)(h) then empowers the Minister to prescribe, by regulation, more content that those orders contain but that does not empower the Minister to perform negotiation processes with PRPs to conclude fair settlement agreements.

The Waste Act does not empower the Minister or MEC to make regulations to promulgate some mechanism that could be used to create a fairness-related mechanism such as a negotiated settlements or reduced liability based on unique circumstances of a case. The Minister is only empowered to make regulations regarding site assessments and its reports.[345] It is silent on any other contaminated land process. At best, the Act empowers the Minister to make regulations for "any other administrative or procedural matter that it is necessary for the proper administration and implementation of th[e] Act" but the legality of relying on that broad provision to make substantive regulations which new mechanisms which give the Minister or MEC additional powers not already based in the Act is questionable since the law does not specifically empower the Minister to do so.[346]

Part 8 could be amended to allow the Minister and MEC to implement measures in cases where fairness dictates a varied or reduced imposition of liability for a PRP.

[344] Section 39(1)(a).
[345] Sections 69(1)(u) and (v).
[346] Section 69(1)(ee).

Apart from negotiated settlements, it has been recommend that a legislated list of liability allocation factors to assist with allocating liability to PRPs[347] subject to all of the considering all relevant facts of each case, the PRPs' circumstances and contributions of each PRP. This was also the CCME's recommendations.[348]

However - it could be argued that there may be a cohesion problem in the suggestions made in this study. How could the country have a liability regime based on: (1) Joint and several liability, and (2), liability based on various fairness and equity considerations? Is it not one or the other? Otherwise, what role does joint and several liability play if that liability can simply be overridden by the minster based on a series of considerations? Joint and several liability is the default imposition of liability but fairness and equity considerations should only apply to PRPs in the circumstances set out under the paragraphs dealing with retrospective liability, fairness and flexibility, and only in extraordinary, specified circumstances. This study proposes solutions to deal with practicalities of achieving PRP involvement in rehabilitation not solely based on joint and several liability. Those proposals apply over and above joint and several liability.

## 5.8 State liability and the creation of a rehabilitation fund

The government's current policy is that find funding for contaminated land rehabilitation be formerly established.[349] Part 8 does not, however, create a fund or other mechanism to fund rehabilitation. This is peculiar since the Waste Act was gazetted in March 2009 and the NWMS in 2012. Equally, the waste management charges' pricing strategy under the Waste Act does not set charges or funding for contaminated land.[350] Creating a funding mechanism for rehabilitation where there are no viable PRPs seems to have been an after-thought.

Part 8 should empower the Minister, together with the Minister of Finance, to create a funding mechanism to rehabilitate specific contaminated land cases. The provision could identify the circumstances where the Minister may use government funds for

[347] Brandon, "Domestic Site Contamination Law" at page 321.
[348] Canadian Council of Ministers of the Environment, "Recommended Principles".
[349] Page 32 of the NWMS.
[350] See sections 13A(2) of the Waste Act.

rehabilitation because creating a fund in the Act should not detract from pursuing PRPs to pay for rehabilitation.

### 5.9 Financial incentives for pollution prevention and voluntary rehabilitation

Part 8 is silent on the creation of financial incentives to incentivise land rehabilitation. A large number of developed countries are already using financial incentives especially for brownfield sites.

The Waste Act only empowers the Minister to create financial incentives to change public behaviour regarding the waste generation and management.[351] The only other financial mechanism closely related to this is in section 24P of NEMA where the Minister is empowered to make regulations to regulate financial guarantees to rehabilitate mining-impacted environments.

The NEMLA Bill gave Parliament an opportunity to include a financial mechanism in the Waste Act or empower the Minister to create mechanisms in consultation with the Minister of Finance. Unfortunately, the NEMLA Bill does not address the issue.

Part 8 could be reformed to empower the Minister to access funds to rehabilitate contaminated land and identify the circumstances where the funds may be used.

A conceptual framework for that provision could contain the following:

- A legislative pronouncement creating a fund for rehabilitating contaminated land.
- The minister responsible for environmental affairs is responsible for the fund and may appoint a functionary like the Director-General of DEFF to manage it.
- The fund is funded from monies obtained from Parliament, taxes, fees paid for permits under the Waste Act, waste charges of section 13A of that Act and monies recovered in enforcement cases under the Waste Act.
- The fund may be used to pay for rehabilitation in certain circumstances, and only where it is in the public's environmental and socio-economic interests:

[351] Section 69(1)(bb).

- the risk of significant harm to human health, the environment or a local economy is significant;
- no landowner or PRPs can be found or are found but are unable to pay for rehabilitation; and
- the landowner can only partially pay for rehabilitation; and
- where no PRPs are identified and the landowner is financially incapable of paying for rehabilitation.

- Funds may only be paid from the fund for rehabilitation if it fair in the circumstances to do. Fairness should be determined from consideration all relevant circumstances about the cause of contamination and each PRP's role in that contamination, including—
  - whether the PRP's action were lawful at the time it was undertaken;
  - whether the PRP wilfully or negligently allowed the pollution to occur;
  - whether rehabilitation will have a general public benefit, and not one limited to the landowner; and
  - whether the land is required for a legitimate social or economic reason.

In New Zealand, for example, their Ministry for the Environment assesses all funding applications for risks that contaminated land poses to human health and the environment using a prioritisation tool.[352] The sites which poses the greatest risks are placed on a priority list used to make recommendations for funding.

## 5.10 Regulatory process for site identification, investigation, assessment and rehabilitation

Part 8 does impose a duty on an owner of land which is significantly contaminated, and on a person who undertakes an activity that caused the land to be significantly contaminated, to notify the government of that contamination. The NEMLA Bill's

[352] Ministry for the Environment. https://www.mfe.govt.nz/more/funding/contaminated-sites-remediation-fund/about-fund. [Accessed 1 December 2019.]

proposal to amend the section 36(5) duty to refer to land that is "likely contaminated" in respect of landowners, while the duty will still only apply for persons who undertakes an activity that caused the land to be "significantly contaminated", does not take the required duty to notify any further. In the absence of more substantive guidance as to *when* that duty arises, landowners may still raise the defence that they simply did not know that the land is likely to be contaminated. The burden of proof would shift to the government to show that the landowner or the PRP knew that the land was likely, or that they activity caused contamination, respectively. The method adopted in section 60(5) of the New South Wales Contaminated Land Management Act may be a helpful reform proposal, where it is actually legislated that a person is taken to be aware of contamination if the person ought reasonably to have been aware of the contamination.

It is also not clear how serious the contamination must be to trigger the duty to notify. There is no clarity on what "significantly contaminated" means in section 36(5). Kidd reminded that the court in the *Hichange* case argued for a low threshold for "significance". Kidd argues that the context within which the term is used in Part 8 and in section 28 of NEMA (discussed in *Hichange*) is essentially the same.[353] The Part 8 Norms and Standards' soil screening values also does provide guidance or a minimum threshold for determining when land is contaminated or significantly contaminated for Part 8. Part 8 or an instrument should therefore give adequate guidance as to what level of contamination warrants notification.

Section 36 also could be less cumbersome by simply giving the Minister or MEC the power to identify areas which is believed to be contaminated. Additionally, the consultation process required by the provision is too onerous (as discussed earlier).[354] Notice to the landowner or occupier of the intended declaration and asking their comment to the proposed declaration, should suffice since the consequence of identification is compelling a site assessment at the cost of the owner or recipient of the notice.

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[353] Kidd (2009) *SAJELP* at page 10.
[354] Contained in sections 72 and 73.

Section 37(1)(b) could be simplified by stating that the Minister may direct a landowner or PRP to do a site assessment. The provision also requires the person doing the site assessment to be independent, but Part 8 does not clarify what this would entail. Regulations for Part 8 could set criteria for this requirement.

Furthermore, it may seem useful to set out exactly, in Part 8, what the assessment report's content must be,[355] this specificity in legislation, generally-speaking, may hinder the administration of a system because of its rigid, mandatory listed requirements. This is because if an amendment of those requirements are required, the Act itself would have to be amended, whereas if they were simply included in regulations, the regulations could be amended as needed, which is a much simpler process than amending an Act of Parliament. Only Parliament is empowered to amend legislation.

The Minister and MEC's powers to decide if land is contaminated or not is unnecessarily complicated with Part 8 giving them four options. They should simply be required to decide if the land is contaminated and if it presents a health or socio-economic risk. They should then be given the power to issue a remediation order or any other appropriate order needed to mitigate the risks to identified classes of PRPs. However, as Kidd points out, discretionary powers, such as the power to decide the level of risk and to issue remediation orders, without sufficient legislative guidance as to when they may be exercised, may be unconstitutional.[356] This was confirmed in the *Dawood* and *Van Rensburg* Constitutional Court cases.[357] Simplicity of the law is not abhorrent to the exercise of constitutionally sound discretionary power though. Both things can true at the same time. It is correct that broad legislated powers not rationally connected to the law's purpose and where it is subject to insufficient guidance as to when it may be exercised, is probably unconstitutional given the principles set out in those cases. Justice O'Regan however noted:

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[355] In section 37(2)(b).
[356] Kidd (2009) *SAJELP* at page 13.
[357] *Dawood and Another v Minister of Home Affairs and Others; Shalabi and Another v Minister of Home Affairs and Others; Thomas and Another v Minister of Home Affairs and Others* 2000 (3) SA 936 (CC) and *Janse van Rensburg NO v Minister of Trade & Industry* NNO 2001 (1) SA 29 (CC) (2000) (11) BCLR 1235.

"Discretion plays a crucial role in any legal system. It permits abstract and general rules to be applied to specific and particular circumstances in a fair manner…At times they will be broad…where the factors relevant to a decision are…impossible for the Legislature to identify them in advance…A further situation may arise where the decision-maker is possessed of expertise relevant to the decisions to be made. There is nothing to suggest that any of these circumstances is present here [in Dawood's case]."[358]

While contaminated land is a highly-complex subject-matter, the Minister and MEC's decisions to require assessments and declare that land is contaminated must be based on sound reasons. This should be expressly stated in Part 8 and Kidd is correct that the guidance to exercise these powers should be described in Part 8, but this study recommends that it does so only to the extent that it does not undermine the implementation of Part 8 by overprescribing jurisdictional facts for powers.

Part 8's remediation order mechanism can also be improved. There should be a legislative prohibition against the recipient of the PRP from diminishing its financial status or assets in order to escape financial liability. Part 8 does not prohibit those kinds of evasive acts which should be an offence in the Waste Act. An example from the British Columbian legislation states that—

> "a person who receives a remediation order…must not, without…consent…knowingly do anything that diminishes or reduces assets that could be used to satisfy the terms…of the remediation order, and if the person does so, the director…may…[act] against the person to recover the amount of the…reduction."[359]

Another missing concept is whether a remediation order must be sent to affected stakeholders and the landowner. Part 8 does not address this directly but the Draft Regulations for Site Assessments and Reports[360] does where draft regulation 7(5) requires notification to affected stakeholders and landowner. Those regulations have however not been finalised. Part 8 itself could state that affected stakeholders and landowner must also be notified of the order and that the Minister may make regulations to guide that process. Finalising those regulations would help address the issues identified at the beginning of this analysis: lack of information (including public knowledge thereof) and lack of enforcement, as regulations will help facilitate certainty and in turn, enforcement.

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[358] Paragraph 53 of the *Dawood* judgment.
[359] Section 48(8) of the Environmental Management Act, 2003 of British Columbia (Canada).
[360] Published in Government Notice 234 of Government Gazette 35161 dated 12 March 2012.

### 5.11 National contaminated sites register

South Africa's lack of useful information concerning the extent of land contamination was highlighted earlier. The deficiencies in the land contaminated register highlighted below exacerbates this challenge and a revamping of the register is recommended.

Part 8 does require the Minister to keep a national register of "investigation areas".[361] The NEMLA Bill proposes to change this to keeping a register of "contaminated land areas".[362] This is a welcomed change because a similar concern was raised in the UK about listing sites where no actual remediation order was issued.[363] The register should only list land for which a remediation order was issued. The question arises if it should list land for which a monitoring and management order was issued. This does not seem necessary because that order is issued because the risk for health on that land is not serious enough.

Part 8 expressly requires the register to list the owners, users and location of the site, nature of the contamination, its remediation status and whether it presents a risk to health or the environment. These details are useful but the register should not contain too much technical or scientific information which could confuse the public and unnecessarily adversely affect the property's owner.[364] The problem here seems not so much the legislation mandating the register but the register itself. The register is a Microsoft Excel document found online. The document is not user-friendly and does not give meaningful details such as the extent and nature of the contamination on the land and its risk to human health and well-being, as is required by Part 8.[365]

Furthermore, the NEMLA Bill proposes to remove the requirement to list "the status of any remediation activities on investigation areas" from the list. It's not clear why this should be removed because it is of public value to know to what extent the land has undergone rehabilitation.

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[361] Section 41.
[362] See section 67 of the NEMLA Bill.
[363] Syms & Simons, *Land Contamination and Reclamation*.
[364] Berveling S, *Scientific World Journal* at paragraph 6.
[365] Sections 41(c) and (d).

Part 8 should also give the Minister the power to prescribe additional information that may be added to the register to allow for any other useful information not thought of currently.

## Chapter 6: Conclusion

Land contamination is a serious problem but it is not a popular problem that receives a lot of media attention. At present, there is a serious lack of information about the extent of, the levels of, land contamination in South Africa. Even South Africa's national and its regional environmental reporting does not adequately provide this information. There is equally a lack of information concerning the enforcement of the land contamination regime. The only enforcement reporting which is recorded in the country is compiled by DEFF on behalf of all of the provincial departments and enforcement agencies as the NECER reports. Those records do not illustrate the extent to which Part 8 of the Waste Act is being enforced regionally, in provinces, or nationally. The reports simply record general enforcement statistics from the Waste Act. Based on those reports and the lack of information concerning contaminated land in the regional provincial reporting (provincial state of environment reports), there is both a lack of information and a lack of enforcement of the contaminated land regime. It follows logically that the consequence of those deficiencies will most likely be negative to the environment and adversely affect some socio-economic circumstances.

South Africa's enactment of a dedicated contaminated land regime should be lauded because, as this study has shown, a dedicated regime is needed to tackle the problem. However, the goals of that regime can only be achieved if the legislative basis of that regime provides an enabling platform from which to operate. The regime must be legislatively adequate so that it has the tools needed by its implementers to achieve those goals.

The legislative best-practice elements set out in this study have important functions in a contaminated land regime. They can be described as the collation of many countries' experiences in the administration and enforcement of contaminated land laws and must

be taken seriously. They are also the result of scholarly studies on the modelling contaminated land laws, as well as by institutions like the IUCN.

Part 8 of the Waste Act, together with its subordinate instruments, contains too few of these legislative elements in proper articulated form with the result that it warrants legislative reform. One positive critique is that Part 8 does establish a national contaminated land register.

Some of the reforms that this study recommends are listed below but they are overarched by a call by this study to have Part 8 redrafted so that it is textually, and conceptually, coherent.

1. The contaminated land register's format from an Excel document should be changed. The proposal to remove the status of any remediation activities on land should be abandoned.
2. Part 8 must expressly empower the imposition of joint and several liability in its powers to issue remediation orders.
3. Decisions whether land is contaminated should be simplified.
4. Part 8 should express that PRPs are strictly liable.
5. Retrospective liability should be limited to civil liability and a balanced approach to imposing liability should be articulated which is considers the context of the pollution acts.
6. Funding for potentially socially and economically viable contaminated land should be created in legislation.
7. Public participation must be simplified and also extended to intermediary steps before the final decision.

The lack of information of the extent of contaminated land in South Africa and the enforcement of Part 8 should improve if the reform measures proposed by this study are implemented.

**BIBLIOGRAPHY**


Primary Sources

*Statutes – South Africa*

- Constitution of the Republic of South Africa, 1996
- National Environmental Management Act, 1998 (Act No. 107 of 1998)
- National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
- National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
- National Environmental Management: Protected Areas Act, 2004 (Act No. 57 of 2003)
- Environment Conservation Act, 1973 (Act No. 73 of 1989)
- Water Act, 1998 (Act No. 36 of 1998)
- The Promotion of Administrative Justice Act, 2000 (Act No. 3 of 2000)
- Income Tax Act, 1962 (Act No. 58 of 1962)

*Statutes – Foreign Jurisdictions*

- Russian Ministerial Decree No. 112 on Land Tenure of Contaminated Land
- Mexican General Law for Prevention and Integral Management of Wastes (2004)
- United Kingdom's Environment Protection Act, 1990 (1990 c. 43)
- United State of America's Comprehensive Environmental Response, Compensation, and Liability Act, 1980 (USC 94 Stat 2767)
- Western Australia's Contaminated Sites Act 60 of 2003
- Superfund Amendments and Reauthorization Act, 1986 (100 Stat 1613)
- United Kingdom Environment Act, 1995 (1995 c. 25)
- Australian Queensland Contaminated Land Act, 1991 (No. 96 of 1991)
- Australian New South Wales Contaminated Land Management Act, 1997 (Act 140 of 1997)
- Western Australia Contaminated Sites Act, 2003 (Act 60 of 2003)
- Canadian - British Columbian Environmental Management Act, 2003 (SBC 2003, c 53)

*Bills of Parliament – South Africa*

- National Environmental Management Laws Amendment Bill, 2017 (Bill B14D of 2017). Available at https://pmg.org.za/bill/706/. [Accessed on 19 November 2019.]

*Case law – South Africa*

- *Affordable Medicines Trust and Others v Minister of Health and Another* 2006 (3) SA 247 (CC)
- *Bertie van Zyl (Pty) Ltd and Others v Minister for Safety and Security and Others* CCT 77/08 [2009] ZACC 11

- *Company Secretary of ArcelorMittal South Africa v Vaal Environmental Justice Alliance* 2015 (1) SA 515 (SCA)
- *Company Secretary of ArcelorMittal South Africa v Vaal Environmental Justice Alliance* 2015 (1) SA 515 (SCA)
- *Chief Pule Shadrack VII Bareki NO and Another v Gencor Limited and Others* 2006 (8) BCLR 920 (T)
- *Harmony Gold Mining Co Ltd v Regional Director: Free State, Department Water Affairs and Forestry* (2006) JDR 0465 (SCA)
- Harmony Gold Mining Co Ltd v Regional Director: Free State Department of Water Affairs, and Others 2014 (3) SA 149 (SCA)
- *Hichange Investments (Pty) Ltd v Cape Produce Co (Pty) Ltd t/a Pelts Products and others* 2004 (2) SA 393 (E)
- *Kruger and Another v Minister of Water and Environmental Affairs and Others* [2016] 1 All SA 565 (GP)
- *Dawood and Another v Minister of Home Affairs and Others; Shalabi and Another v Minister of Home Affairs and Others; Thomas and Another v Minister of Home Affairs and Others* 2000 (3) SA 936 (CC)
- *Janse van Rensburg NO v Minister of Trade & Industry* NNO 2001 (1) SA 29 (CC) (2000) (11) BCLR 1235

*Case law – Foreign jurisdictions*

- *Cambridge Water Co v Eastern Counties Leather PLC* [1993] UKHL 12
- *Burnie Port Authority v General-Jones Pty Ltd* [1994] HCA 13

*Subordinate instruments – South Africa*

- National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (Government Notice No. 331 of Government Gazette 37603 dated 2 May 2014)
- Proclamation 26 of 2014 in Government Gazette 37547 dated 11 April 2014. The proclamation which brought Part 8 of the Waste Act into effect.
- Draft Regulations for Assessments and Reports, published in Government Notice 234 of Government Gazette 35161 dated 12 March 2012
- National Waste Management Strategy, (2012), published in Government Notice 344 in Government Gazette 35306 dated 4 May 2012
- Draft Regulations for Site Assessments and Reports, published in Government Notice 234 of *Government Gazette* 35161 dated 19 March 2012

*Policy documents – South Africa*

- White Paper on Environmental Management Policy, (1997), published in Government Notice 1096 in Government Gazette 18164 dated 28 July 1997
- White Paper on Integrated Pollution and Land Management, (2000), published in Government Notice No. 227 of Government Gazette 20978 dated 17 March 2000

- Department of Environmental Affairs, “Framework for the Management of Contaminated Land, (2010) published in May 2010. Available at http://sawic.environment.gov.za/documents/562.pdf. [Accessed on 20 August 2019.]


Secondary sources

*Books*


- Brevik E & Burgess L, (2013), “Soils and Human Health”, 1st Edition, published by CRC Press on 16 November 2016, Florida, USA, (ISBN 9781138199316)
- Wong M, Bradshaw A & Bradshaw D (eds), (2002), “The Restoration and Management of Derelict Land: Modern Approaches”, World Scientific Publishing, Singapore, (ISBN 9812382534)
- Mohd M, Maah J & Yusoff I, (2013), “Soil Contamination, Risk Assessment and Remediation” in *Environmental Risk Assessment of Soil Contamination*, Edited by Hernandez-Soriano M, IntechOpen. Available at https://www.intechopen.com/books/environmental-risk-assessment-of-soil-contamination/soil-contamination-risk-assessment-and-remediation. [Accessed on 29 October 2019.]
- Forti V, Baldé C & Kuehr R, (2018) “E-waste Statistics: Guidelines on classification, reporting and indicators”, Second Edition, United Nations University, Bonn, Germany (2018)


*Studies and journals*


- Görlach B, Landgrebe-Trinkunaite R, Interwies E, Bouzit M, Darmendrail D & Rinaudo J, (2004), “Assessing the Economic Impacts of Soil Degradation. Volume IV: Executive Summary”. Study commissioned by the European Commission, DG Environment, Study Contract ENV.B.1/ETU/2003/0024, Berlin
- Dudka S, Piotrowska M & Terelak H, (1996), “Transfer of cadmium, lead, and zinc from industrially contaminated soil to crop plants: A field study”, *Environmental Pollution*, Volume 94, Issue 2 at page 181
- Barnes G, Litva A and Tuson S, (2005), “The social impact of land contamination: reflections on the development of a community advocacy and counselling service following the Weston village incident”, *The Journal of Public Health,* Vol. 27(3)
- Dudgeon D, Arthington A, Gessner M & Sullivan C, (2006), “Freshwater biodiversity: Importance, threats, status and conservation challenges”, *Biological Reviews*, Issue 81, Volume 2 at page 163.
- Kidd M, (2009), “Should bad law be remedied? The contaminated land provisions in the National Environmental Management: Waste Act”, *SAJELP* volume 16, page 1
- Jeffery M and Zhao X, (2012), “Developing a national contaminated land liability scheme in China: The comprehensive environmental response, compensation, and

Liability Act revisited”*, Journal of Energy and Natural Resources Law*, Issue 30 at page 423

- Barnes G, Baxter J, Litva A & Staples B*,* (2002), “The Social and psychological impact of the chemical contamination incident in Weston village, UK: a qualitative analysis”, *Social Science Medicine*, Volume 55 at page 2227
- Fowlkes M and Miller P, (1982), “The Love Canal: the social construction of disaster”. Report to the Federal Emergency Management Agency. Available at https://apps.dtic.mil/dtic/tr/fulltext/u2/a125410.pdf. [Accessed on 1 October 2019.]
- Caldwell I and Wang X, (2011), *“*A Hidden Problem: China’s Contaminated Site Soil Pollution Crisis”, USAid Asia, Vermont Law School. Available at http://www.vermontlaw.edu/Documents/China%20Program/CaldwellWangPaper3.pdf. [Accessed on 8 September 2018];
- Plaza P, M Uhart, Caselli A, Wiemeyer G & Lambertucci A, (2018), “A review of lead contamination in South American birds: The need for more research and policy changes”, *Perspectives in Ecology and Conservation*, volume16 at page 201
- Zhang W, Su C & Jiang L, (2014), “A review on heavy metal contamination in the soil worldwide: Situation, impact and remediation techniques”, *Environmental Sceptics and Critics*, volume 3(2) at page 24
- Geschwind A, Stolwijk J, Bracken M, Fitzgerald E, Stark A, Olsen C & Melius J, (1992), “Risk of Congenital Malformations Associated with Proximity to Hazardous Waste Sites*”, American Journal of Epidemiology*, Volume 135 No. 11 at page 1197
- Barnes G, Litva A & Tuson S, (2005), “The social impact of land contamination: reflections on the development of a community advocacy and counselling service following the Weston village incident”, *Journal of Public Health*, Volume 27 No. 3 at page 276
- Barnes G, Baxter J, Litva A & Staples B, (2002), “The Social and psychological impact of the chemical contamination incident in Weston village, UK: a qualitative analysis”, *Social Science Medicine,* Volume 55 at page 2227
- Baum A, Singer J & Baum C, (1981), “Stress and the environment”, *Journal of Social Issues*, Volume 37 at page 4
- Fowlkes M and Miller P, (1982) “The Love Canal: the social construction of disaster. Report to the Federal Emergency Management Agency”*.* Available at https://apps.dtic.mil/dtic/tr/fulltext/u2/a125410.pdf. [Accessed on 1 October 2019.]
- Alabi O, Bakare A, Xu X, Li B, Zhang Y & Huo X, (2012),“Comparative evaluation of environmental contamination and DNA damage induced by electronic-waste in Nigeria and China”, *Science of the Total Environment,* Volume 423 at page 62
- Shah S, (2012), “Importance of Genotoxicity & S2A guidelines for genotoxicity testing for pharmaceuticals”, *IOSR Journal of Pharmacy and Biological Sciences* Volume 1, Issue 2, page 43
- Pearce K, Snyman H, Van Heerden H, Greben H & Oellermann R, (1995), *“*Bioremediation technology for the treatment of contaminated soils in South Africa”*,* CSIR, WRC Report No. 543/1/95
- Atagana H, (2004), “Bioremediation of creosote-contaminated soil in South Africa by landfarming”, *Journal of Applied Microbiology*, Issue 96 at page 96

- Davlie M, Cairncross E, Solomon & London A, (2003), “Contamination of rural surface and ground water by endosulfan in farming areas of the Western Cape, South Africa”, *Environmental Health,* Issue 2, Article 1
- Bardos P, Nathanail J & Pope B, (2002), “General principles for remedial approach selection”, *Land Contamination & Reclamation,* Volume 10(3)
- Fogleman V, (2014), “The contaminated land regime: Time for a regime that is fit for purpose Part 1”*, International Journal of Law in the Built Environment*, Volume 6, Issue 1 at page 43
- Hannam I & Boer B, (2004), “Drafting Legislation for Sustainable Soils: A Guide”, *Environmental Policy and Law*, IUCN Environmental Law Programme*,* Paper No. 52*.*
- Saxe D, “Retrospective liability for environmental contamination”, (1992), *The Canadian Bar Review*, Volume 71, No. 3 at page 492.
- Field T, (2007), “Letting polluters off the hook? The impact of Bareki NO v Gencor Ltd 2006 (1) SA 432 (T) on the reach of s 28 of the National Environmental Management Act 107 of 1998”, *South African Journal of Environmental Law and Policy*, Volume 14(1), May 2007 at page 105
- Kingsbury A, (1998), “Funding the Remediation of Contaminated Land in Australia and New Zealand: the Problem of Orphan Sites”*, Waikato Law Review* 37, volume 6
- McDonald J, (1994), “Financial Liability for Contaminated Site Clean ups - The Increasingly Strict Standard of Fault-Based Liability”, *Environmental and Planning Law Journal* 11 (6) at page 516
- Deloddere S and Ryckbost D, (1997), “Liability for contaminated sites”*,* European Commission. At https://ec.europa.eu/environment/legal/liability/pdf/soilcont.pdf. [Accessed on 25 October 2019.]
- Chang H & Sigman H, (2007), “The effect of joint and several liability under superfund on brownfields”*, International Review of Law and Economics*, Volume 27, Issue 4 at page 363
- Wong C & Bäing A, (2010), “Brownfield residential redevelopment in England. What happens to the most deprived neighbourhoods?”*,* Joseph Rowntree Foundation. Available at https://www.jrf.org.uk/sites/default/files/jrf/migrated/files/brownfield-residential-redevelopment-full.pdf. [Accessed on 28 October 2019.]
- Luo Q, Catney P & Lerner D, (2009), “Risk-Based Management of Contaminated Land in the UK: Lessons for China?”, *Journal of Environmental Management*, Volume 90 at page 1123
- Berveling S, (2002), “Analysis of Australian Legislation Dealing with Contaminated Land”, *Scientific World Journal*, Volume 2, page 1167
- Syms P & Simons R, (1999), “Contaminated land registers: an analysis of the UK and USA approaches to public management of contaminated sites”, *Land Contamination and Reclamation*, EPP Publications, Volume 7 No. 2
- Mathee A, (2011), “Environment and health in South Africa: Gains, losses, and opportunities”, *Journal of Public Health*, Volume 32 (S1).

*Organisational reports*


- WWF-SA, South Africa, *The Food Energy Water Nexus: Understanding South Africa's most urgent sustainability challenge* (2014). Available at http://www.fewlbnexus.uct.ac.za/nexus-publications. [Accessed on 1 August 2019.]
- European Commission, DG Environment (2013), *Science for Environment Policy In-depth Report: Soil Contamination: Impacts on Human Health* at pages 4, 10. Available at: http://ec.europa.eu/science-environment-policy. [Access on 1 November 2018.]
- CSIR, "A CSIR Perspective on water in South Africa", (2010). Report No. CSIR/NRE/PW/IR/2011/0012/A. Available at www.csir.co.za/nre/docs/CSIR%20Perspective%20on%20Water_2010.PDF [Accessed on 20 March 2011.]
- DEFF, (2012), "2nd South Africa Environment Outlook. A report on the state of the environment"
- IUCN Environmental Law Programme, Hannam I and Boer B, *Drafting Legislation for Sustainable Soils: A Guide*, (2004), 'Environmental Policy and Law Paper No 52, World Conservation Union'
- Department of Environmental Affairs, '*The National Environmental Compliance and Enforcement Report 2015/16*'
- Department of Environmental Affairs, '*The National Environmental Compliance and Enforcement Report 2016/17'*
- Department of Environmental Affairs, '*The National Environmental Compliance and Enforcement Report 2017/18*'
- Department of Environmental Affairs, '*The National Environmental Compliance and Enforcement Report 2018/19'*
- Plant R, Wilmot K & Ege C, (2014), "Contaminated Soil Wastes in Australia", Institute for Sustainable Futures, University of Technology, Sydney. Available at https://www.environment.gov.au/system/files/resources/35be09f5-cb2e-488d-baec-63585a13fc70/files/contaminated-soil-wastes-australia.pdf. [Accessed on 6 August 2019.]
- The Department of Water Affairs and Forestry, (2004), "Groundwater Protection - Guidelines for Protecting Springs"
- Department of Environmental Affairs, *South Africa State of Waste Report (Second Draft Report)*, (2018)
- Department of Environmental Affairs, 'National Waste Management Strategy', (2011), published in Government Notice No. 344 in Government Gazette 35306 dated 4 May 2012
- Boyd J, (1999), "Environmental Remediation Law and Economies in Transition", *Resources for the Future*, Discussion Paper 99-21. Available at https://ageconsearch.umn.edu/record/10721/files/dp990021.pdf. [Accessed on 22 October 2019.]
- Chinese Council for International Cooperation on Environment & Development, (2015), "Special Policy Study on Soil Pollution Management". Available at

https://www.iisd.org/sites/default/files/publications/CCICED/prevention/2015/policy-study-on-soil-pollution-management.pdf. [Accessed on 28 August 2019.]

- Caldwell I and Wang X, 'A Hidden Problem: China's Contaminated Site Soil Pollution Crisis', (2011), USAid Asia, Vermont Law School. Available at http://www.vermontlaw.edu/Documents/China%20Program/CaldwellWangPaper3.pdf. [Accessed on 19 August 2019.]
- The United Nations, 'Rio Declaration on Environment and Development', United Nations "*Conference on Environment and Development"*, (3 to 14 June 1992), United Nations document A/CONF.151/26 (Vol. I) dated 12 August 1992
- European Environment Agency, European Union, (2007), "Europe's Environment: The Fourth Assessment". Available at https://ftp.eea.europa.eu/www/eea-data/Belgrade_EN_all_chapters_incl_cover.pdf. [Accessed on 12 September 2019.]
- Canadian Council of Ministers of the Environment, (2006), "Recommended Principles on Contaminated Sites Liability", PN 1361, ISBN-101-896997-53-8. Available at https://www.ccme.ca/files/Resources/csm/csl_14_principles_e.pdf. [Accessed on 5 September 2019.]
- Network for Industrially Contaminated Land in Europe, 'Discussion Paper on: Need for Sustainable Land Management: Role of a Risk Assessment Based Approach', (2002), Issue No 2 of 2002
- Environment Protection Agency, (2018), "Superfund: Transforming Communities – Accomplishments Report Fiscal year 2018". Available at https://semspub.epa.gov/work/HQ/100001884.pdf. [Accessed on 25 October 2019.]
- Contaminated Land: Applications in Real Environments (CL:AIRE), (2010), "Defra Research Project Final Report Contaminated Land Remediation", DEFRA Research Project Number SP1001. Available at http://sciencesearch.defra.gov.uk/Document.aspx?Document=SP1001_9957_FRP.pdf. [Accessed on 28 October 2019.]
- UK Department for Communities and Local Government, (2015), "Building more homes on brownfield land: Consultation proposals". Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/398745/Brownfield_Consultation_Paper.pdf. [Accessed on 28 October 2019.]
- US Environment Protection Agency, (2015), "Anatomy of Brownfields Redevelopment". Available at https://www.epa.gov/sites/production/files/2015-08/documents/anat_bf_redev_101106.pdf. [Accessed on 5 September 2019.]
- US Environmental Protection Agency, (2005), "Investing in Partnership, Possibility and People: A Report to Stakeholders from the USEPA Brownfields Program", EPA Record No. 65165577
- United Nations Environment Programme and French Environment and Energy Management Agency, (2005), "Identification and Management of Contaminated Sites: A Methodological Guide". Available at http://www.unep.fr/shared/publications/pdf/WEBx0130xPA-ContaminatedEN.pdf. [Accessed on 29 October 2019.]

- European Commission DG Environment, “In-depth Report - Soil Contamination: Impacts on Human Health*”,* (2013), *Science for Environment Policy In-depth Report*. Available at http://ec.europa.eu/science-environment-policy. [Access on 1 November 2018.]


*Theses*


- Zhao X, (2012), “Developing an Appropriate Contaminated Land Regime in China (Lessons Learned from the US and UK)", D Phil Thesis, University of Western Sydney. Available at https://researchdirect.westernsydney.edu.au/islandora/object/uws%3A31334. [Accessed June 2019.]
- Brandon E, (2011), “The Development and Harmonisation of Domestic Site Contamination Law: The Role of International Law and Other Mechanisms”, D Phil Thesis, University of South Australia
- Van Zyl A, (2013) “The effect of a creosote stockyard on the environment, vines and wines, Masters Thesis, University of Stellenbosch. Available at https://scholar.sun.ac.za/bitstream/handle/10019.1/80273/vanzyl_effect_2013.pdf?sequence=2&isAllowed=y. [Accessed on 12 June 2019]
- Borenstein D, (2013), “A Vicious CERCLA, Or The Twilight of the Superfund”, Student Thesis, Fordham University. Available at https://fordham.bepress.com/environ_theses/2/. [Accessed on 19 June 2019.]


*Internet Resources*


- United Nations Development Programme http://www.za.undp.org/content/south_africa/en/home/sustainable-development-goals.html
- *CBC News article* https://www.cbc.ca/news/canada/edmonton/domtar-northeast-edmonton-dioxins-furans-1.4580057. [Accessed on 12 June 2019]
- Zhang C, “Changzhou pollution scandal highlights holes in China’s environmental enforcement” (24 April 2016). Available at https://www.chinadialogue.net/article/show/single/en/8892-Changzhou-pollution-scandal-highlights-holes-in-China-s-environmental-enforcement. [Accessed on 13 November 2018].
- Stodghill D, “Decades after a plant closes, waste remains”, (29 July 2007). Available at https://www.nytimes.com/2007/07/29/business/yourmoney/29spill.html. [Accessed on 4 July 2019.]
- World Health Organisation at http://www.who.int/ipcs/assessment/public_health/chemicals_phc/en/. [Accessed on 1 November 2018.]

- Kleiman J, ‘Love Canal: A brief history’, (undated). Available at https://www.geneseo.edu/history/love_canal_history. [Accessed on 20 October 2019.]
- International Committee on Contaminated Land http://www.iccl.ch/download/2015_participating_orgs.pdf. [Accessed on 6 August 2019.]
- South African Waste Information Center http://sawic.environment.gov.za/
- National Contaminated Land Register. Available at http://sawic.environment.gov.za/documents/9398.xlsx [Accessed on 31 August 2019.]
- Faku D, ‘ArcelorMittal has to answer for environmental contraventions in court’, 14 June 2019. Available at https://www.iol.co.za/business-report/companies/arcelormittal-has-to-answer-for-environmental-contraventions-in-court-26218569 [Accessed 14 October 2019.]
- Remediation order available at http://sawic.environment.gov.za/sawis-license/documents/download/2691. [Accessed on 25 September 2019.]
- The London School of Economics and Political Science at http://www.lse.ac.uk/GranthamInstitute/faqs/what-is-the-polluter-pays-principle/. [Accessed on 2 September 2019 2019.]
- Center for Environmental Rights, at https://cer.org.za/virtual-library/judgments/high-courts/chief-pule-shadrack-vii-bareki-no-and-another-v-gencor-limited-and-others-2006-8-bclr-920-t. [Accessed on 12 December 2019.]
- Dinkins C, ‘CERCLA Settlement Considerations’, (2012), *The Practical Real Estate Lawyer* at page 42. Available at https://www.velaw.com/uploadedfiles/vesite/resources/prel1201_dinkins.pdf. [Accessed on 8 September 2019.]
- European Commission, (2006), “Proposal for a Directive of the European Parliament and of the Council establishing a framework for the protection of soil and amending Directive 2004/35/EC”, COM (2006) 232, Final, Brussels, 22 September 2006
- European Commission, https://ec.europa.eu/environment/soil/index_en.htm. [Accessed on 13 December 2019.]
- European Commission - Press release, ‘Environment: Commission calls for a stronger response to soil degradation’, Brussels 2012. Available at https://europa.eu/rapid/press-release_IP-12-128_en.htm?locale=en. [Accessed on 13 December 2019.]
- US Environment Protection Agency at https://www.epa.gov/brownfields/overview-epas-brownfields-program). [Accessed on 28 October 2019.]
- UK Home Building Fund at https://homebuildingfund.campaign.gov.uk/. [Accessed on 28 October 2019.]
- US Environment Protection Agency at https://www.epa.gov/superfund. [Accessed on 28 October 2019.]
- US Environment Protection Agency at https://www.epa.gov/brownfields/types-brownfields-grant-funding. [Accessed on 29 October 2019.]

- US Environmental Protection Agency at https://www.epa.gov/brownfields/brownfields-program-accomplishments-and-benefits. [Accessed on 29 October 2019.]
- Government Printing Works at http://www.gpwonline.co.za/Gazettes/Pages/default.aspx. [Accessed on 29 August 2019.]
- Information on Canada at https://www.canadavisa.com/about-british-columbia.html#gs.hjfwk2. [Accessed on 19 November 2019.]
- New Zealand Ministry for the Environment, at https://www.mfe.govt.nz/more/funding/contaminated-sites-remediation-fund/about-fund. [Accessed on 1 December 2019.]
- United Nations Environment Programme, at http://www.za.undp.org/content/south_africa/en/home/sustainable-development-goals.html