

# Draft Standard for Assessment of Waste for Landfill Disposal

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The operational divisions that make up Interwaste (Pty) Ltd offer a wide range of environmental products and services. The synergies that exist between these divisions allow the company to present itself as a one-stop environmental services provider.

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- WASTE COMMODITY TRADING
- CONTAMINATED LAND PROJECTS



The waste management industry in South Africa is a dynamic, continually evolving entity. Through prudent government leadership it is being steered toward a situation where it can successfully respond to ever more stringent environmental challenges.

The legislation reprinted here will have far reaching consequences on the waste industry, and by default, on every South African.

But its implementation will not be easy.

It will make demands of all stakeholders, from the waste generator to those in local government tasked with overseeing delivery and compliance.

A task made easier with the right partners.

The operational divisions that make up Interwaste (Pty) Ltd allow the company to present itself as a one-stop holistic environmental services supplier.

From waste collection and treatment to recycling and resource reutilisation.

From landfill facility construction and management to site clearing and the rehabilitation of polluted land.

The fact that Interwaste has been promoting these proposed strategies as the basis of its' operational vision for many years reinforces the companys' claim to being at the forefront of waste management development in South Africa.

This booklet should prove of interest and assistance to every waste generator. Interwaste can assist should you need further information on any general or specific area relating to waste management in southern Africa.



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**GENERAL NOTICE**

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**DEPARTMENT OF ENVIRONMENTAL AFFAIRS**

**NOTICE.....OF 2010**

**NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (ACT  
NO. 59 of 2008)**

**DRAFT STANDARD FOR ASSESSMENT OF WASTE FOR LANDFILL  
DISPOSAL**

I, Buyelwa Sonjica, Minister of Water and Environmental Affairs, intend setting a Standard for Assessment of Waste for Landfill Disposal under Section 7(1)(a) and 7(1)(c) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) as set out in the Schedule hereto.

Any person who wishes to submit written representations or comments in connection with the draft standard are invited to do so within 60 days of the date of this notice. All written representations and comments must be submitted in writing to the Director-General of the Department of Environmental Affairs:

By post to: The Director-General, Attention: Ms. Nomphele Daniel,  
Department of Environmental Affairs, Private Bag X447,  
Pretoria, 0001

Delivered to: The Department of Environmental Affairs, Attention: Ms.  
Nomphele Daniel, Fedsure Forum Building, 315 Pretorius Street,  
Pretoria, 0002

By fax to: (012) 320 .....

By e-mail to: [ndaniel@environment.gov.za](mailto:ndaniel@environment.gov.za)

Comments received after the closing date may not be considered.

**BUYELWA SONJICA**

**MINISTER OF WATER AND ENVIRONMENTAL AFFAIRS**

**SCHEDULE**

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**PART 1: INTERPRETATION AND PURPOSE**

**1. Definitions**

(1) In this Standards any word or expression to which a meaning has been assigned in the Act has that same meaning, and unless the context requires otherwise—

“**LC**” means the leachable concentration of a particular contaminant in a waste, expressed as mg/l;

“**LCT**” means the leachable concentration thresholds for particular contaminants in a waste prescribed in Section 6 of this Standard;

“**putrescible waste**” means waste that contains organic matter capable of being decomposed by microorganisms giving rise to obnoxious odours, or which is capable of providing food for birds and animals, thereby attracting vermin or disease causing vectors such as flies.

“**TC**” means the total concentration of a particular contaminant in a waste, expressed as mg/kg;

“**TCT**” means the total concentration thresholds for particular contaminants in a waste as prescribed in Section 6 of this Standard;

“**the Act**” means the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008);

“**the Regulations**” means the Waste Classification and Management Regulations (*GN R....., ..... December 2010*);

## **2. Purpose and Application**

(1) This Standard prescribes the requirements for the assessment of the level of risk associated with the disposal of waste to landfill in terms of Regulation 8(1) of the Regulations.

(2) This Standard does not apply to waste stored in lagoons.

## **PART 2: STANDARD ASSESSMENT METHODOLOGY**

### **3. Approach**

(1) To determine the level of risk associated with the disposal of waste to landfill, the following are required—

- (a) identification of contaminants present in the waste; and
- (b) sampling and analysis to determine the total concentrations (TC) and leachable concentrations (LC) for the contaminants specified in Section 6 of this Standard that are present in the waste.

(2) The TC and LC values of the contaminants in the waste must be compared to the four levels of threshold limits specified in Section 6 of this Standard for total concentrations (TCT values) and leachable concentrations (LCT values) of specific contaminants.

(3) Based on the TC and LC values of the contaminants in the waste exceeding the corresponding TCT and LCT values respectively, the level of risk associated with the disposal of the waste to landfill must be assigned to the waste in terms of Section 7 of this Standard.

#### **4. Total Concentration (TC) Analysis**

(1) The TC of all the contaminants specified in Section 6 that are known, likely to occur or can reasonably be expected to occur in the waste must be determined.

(2) The TC of contaminants in waste must be determined using suitable national or international standard extraction techniques and analysis methods that will provide an accurate and precise result of the TC of contaminants specified in Section 6.

(3) The analysis of the TC of contaminants in waste may only be conducted by laboratories accredited to conduct the particular tests required.

(4) If the TC of a particular contaminant in the waste is less than twenty (20) times the lowest leachable concentration thresholds (LCT<sub>i</sub> or LCT<sub>0</sub> value) specified for the particular contaminant in Section 6 of this Standard, the LC of this contaminant does not have to be determined.

(5) If the TC of all contaminants are less than twenty (20) times the corresponding LCT<sub>i</sub> or LCT<sub>0</sub> values specified in Section 6 of this Standard for the contaminants, no further analysis to determine the LC of the contaminants are required, and the level of risk associated with the disposal of the waste to landfill may be assigned to the waste in terms of Section 7 of this Standard based on the TC of the contaminants.

## **5. Leachable Concentration (LC) Analysis**

(1) If the TC of a contaminant is more than twenty (20) times the lowest leachable concentration thresholds (LCT<sub>i</sub> or LCT<sub>0</sub> value) specified for the particular contaminant in Section 6 of this Standard, the LC of the contaminant must be determined.

(2) The LC of contaminants must be determined using the Australian Standard Leaching Procedure (AS 4439.1, 4439.2 and 4439.3).

(3) The analysis of the LC of contaminants in waste may only be conducted by laboratories accredited to conduct the particular tests required.

(4) The type of leaching solution used in the procedure will depend on the nature of the waste and/or the particular disposal practice, and must accordingly be determined as follows—

- (a) Waste to be disposed of with or waste that contains putrescible wastes: Use 0.1M acetic acid solution with altered pH 5.0 or pH 2.9 depending on the acid neutralisation capacity of waste;
- (b) Waste to be disposed of with non-putrescible waste: Use a basic 0.1M sodium tetraborate decahydrate solution of pH 9.2 ±0.1, as well as an acetic acid solution (pH 5.0 or 2.9); or
- (c) Non-putrescible waste to be disposed of without any other wastes (mono-disposal): Use reagent water.

(5) Existing LC results for contaminants in wastes, which have been determined in terms of the TCLP leach test criteria of the Minimum

Requirements for the Handling, Classification and Disposal of Hazardous Waste (2<sup>nd</sup> Edition, 1998; Department of water Affairs and Forestry) prior to the Regulations taking effect, may be utilised for comparison with the LCT values in Section 6 to determine the level of risk associated with the disposal of the waste to landfill, for a period not exceeding eighteen (18) months from the date of publication of this Notice.

## 6. LCT and TCT Threshold Values

Contaminants in Waste	LCTi mg/l	TCTi mg/kg	LCT0 mg/l	TCT0 mg/kg	LCT1 mg/l	TCT1 mg/kg	LCT2 mg/l	TCT2 mg/kg
<b><i>Metal Ion Contaminants</i></b>								
As, Arsenic	0.01	5.8	0.5	500	1	500	4	2000
B, Boron	0.5	150	25	15000	50	15000	200	60000
Ba, Barium	0.7	62.5	35	6250	70	6250	280	25000
Cd, Cadmium	0.005	7.5	0.25	260	0.5	260	2	1040
Co, Cobalt	0.5	50	25	5000	50	5000	200	20000
Cr <sub>Total</sub> , Chromium Total	0.1	46000	5.0	800000	10	800000	40	N/A
Cr(VI), Chromium (VI)	0.05	6.5	2.5	500	5	500	20	2000
Cu, Copper	1.0	16	50	19500	100	19500	400	78000
Hg, Mercury	0.001	0.93	0.05	160	0.1	160	0.4	640
Mn, Manganese	0.4	1000	20	25000	40	25000	160	100000
Mo, Molybdenum	0.07	40	3.5	1000	7	1000	28	4000
Ni, Nickel	0.07	91	3.5	10600	7	10600	28	42400
Pb, Lead	0.01	20	0.5	1900	1	1900	4	7600
Sb, Antimony	0.01	10	0.5	75	1	75	4	300
Se, Selenium	0.01	10	0.5	50	1	50	4	200
V, Vanadium	0.1	150	5.0	2680	10	2680	40	10720
Zn, Zinc	3.0	240	150	160000	300	160000	1200	640000
<b><i>Inorganic Anions</i></b>								
TDS	250	N/A	2500	N/A	5000	N/A	20000	N/A
Chloride	100	N/A	1000	N/A	2000	N/A	8000	N/A
Sulphate	200	N/A	2000	N/A	4000	N/A	16000	N/A
NO <sub>3</sub> as N, Nitrate-N	6.0	N/A	300	N/A	600	N/A	2400	N/A
F, Fluoride	1.0	100	50	10000	100	10000	400	40000
CN <sup>-</sup> (total), Cyanide Total	0.05	14	2.5	10500	5	10500	20	42000
<b><i>Organic Contaminants</i></b>								
Benzene	N/A	0.05	0.01	10	0.02	10	0.08	40
Benzo(a)pyrene	N/A	0.05	0.035	1.7	0.07	1.7	0.28	6.8
Carbon tetrachloride	N/A	0.05	0.20	4	0.40	4	1.6	16
Chlorobenzene	N/A	0.05	5.0	8800	10	8800	40	35200
Chloroform	N/A	0.05	15	700	30	700	120	2800
2-Chlorophenol	N/A	0.05	525	2100	30	2100	120	8400
Di (2 ethylhexyl) phthalate	N/A	0.05	0.50	40	1	40	4	160
1,2-Dichlorobenzene	N/A	0.05	50	31900	10	31900	40	127600

Contaminants in Waste	LCTi mg/l	TCTi mg/kg	LCT0 mg/l	TCT0 mg/kg	LCT1 mg/l	TCT1 mg/kg	LCT2 mg/l	TCT2 mg/kg
1,4-Dichlorobenzene	N/A	0.05	15	18400	30	18400	120	73600
1,2-Dichloroethane	N/A	0.05	1.5	3.7	3	3.7	12	14.8
1,1-Dichloroethylene	N/A	0.05	0.35	150	0.7	150	2.8	600
1-2-Dichloroethylene	N/A	0.05	2.5	3750	5	3750	20	15000
Dichloromethane	N/A	0.05	0.25	16	0.5	16	2	64
2,4-Dichlorophenol	N/A	0.05	10	800	20	800	80	3200
2,4-Dinitrotoluene	N/A	0.05	0.065	5.2	0.13	5.2	0.52	20.8
Ethylbenzene	N/A	0.05	3.5	540	7	540	28	2160
Formaldehyde	N/A	0.05	25	2000	50	2000	200	8000
Hexachlorobutadiene	N/A	0.05	0.03	2.8	0.06	2.8	0.24	5.4
Methyl ethyl ketone	N/A	0.05	100	8000	200	8000	800	32000
MTBE (Methyl t-butyl ether)	N/A	0.05	2.5	1435	5.0	1435	20.0	5740
Nitrobenzene	N/A	0.05	1	45	2	45	8	180
PAHs (total)	N/A	0.05	N/A	50	N/A	50	N/A	200
Petroleum H/Cs, C6 to C9	N/A	0.05	N/A	325	N/A	650	N/A	2600
Petroleum H/Cs, C10 to C36	N/A	0.05	N/A	5000	N/A	10000	N/A	40000
Phenols (total, non-halogenated)	N/A	0.05	7	560	14	560	56	2240
Polychlorinated biphenyls	N/A	0.05	0.025	3	0.05	3	0.2	12
Styrene	N/A	0.05	1.0	120	2	120	8	480
1,1,1,2-Tetrachloroethane	N/A	0.05	5	400	10	400	40	1600
1,1,2,2-Tetrachloroethane	N/A	0.05	0.65	5.0	1.3	5.0	5.3	20
Tetrachloroethylene	N/A	0.05	0.25	200	0.5	200	2	800
Toluene	N/A	0.05	35	1150	70	1150	280	4600
Trichlorobenzenes (total)	N/A	0.05	3.5	3300	7	3300	28	13200
1,1,1-Trichloroethane	N/A	0.05	15	1200	30	1200	120	4800
1,1,2-Trichloroethane	N/A	0.05	0.6	48	1	48	4	192
Trichloroethylene	N/A	0.05	0.25	11600	2	11600	8	46400
2,4,6-Trichlorophenol	N/A	0.05	10.0	1770	20	1770	80	7080
Vinyl chloride	N/A	0.05	0.015	1.5	0.03	1.5	0.12	6.0
Xylenes (total)	N/A	0.05	25	890	50	890	200	3560
<b>Pesticides</b>								
Aldrin + Dieldrin	N/A	0.05	0.015	1.2	0.03	1.2	0.03	4.8
DDT + DDD + DDE	N/A	0.05	1	50	2	50	2	200
2,4-D	N/A	0.05	1.5	120	3	120	3	480
Chlordane	N/A	0.05	0.05	4	0.1	4	0.1	16
Heptachlor	N/A	0.05	0.015	1.2	0.03	1.2	0.03	4.8

**For Information (not to be included in Standard):**

- LCTi values for Metal Ions are the drinking water quality standard.
- Where available the TCTi values for Inert Waste have been adopted from SA Soil Screening Values that are protective of water resources. If not available, the State of Victoria value for fill material (EPA Victoria, Classification of Wastes) has been selected. If values were not available in these references a provisional value was obtained by dividing the TCT0 value by 100.
- The Mn TC values have been increased to reflect the SA situation. In addition, the Inert Waste TC value has been increased to 1000mg/kg as a lower value could include many SA soils.
- Values for LCT0 for TDS, Cl and sulphate were updated based on EU standards. The values proposed have been chosen to ensure that ground and surface water resources are protected.
- The 0.050mg/kg or 50ppb for TCTi for organic compounds was proposed on the basis that this limit could be readily attained by any decent laboratory and that it would mean a maximum leachable concentration of 2.5ppb, i.e. would not impact significantly on water resources particularly when one considers that in a landfill it would not be in contact with the water table.

## 7. Waste Disposal Risk Rating

(1) The risk associated with the disposal of a particular waste to landfill must be assessed by comparing the TC and LC of the contaminants in the waste with the TCT and LCT values specified in Section 6.

(2) Based on the assessment, the level of risk associated with the disposal of the waste to landfill must be assigned to the waste as follows—

- (a) Wastes with any contaminant level above the LCT<sub>2</sub> or TCT<sub>2</sub> values ( $LC > LCT_2$  or  $TC > TCT_2$ ) are Type 1: Very High Risk Wastes;
- (b) Wastes with any contaminant level above the LCT<sub>1</sub> but below LCT<sub>2</sub> values ( $LCT_1 < LC \leq LCT_2$ ), or above the TCT<sub>1</sub> but below TCT<sub>2</sub> values ( $TCT_1 < TC \leq TCT_2$ ), are Type 2: High Risk Wastes;
- (c) Wastes with any contaminant level above the LCT<sub>0</sub> but below the LCT<sub>1</sub> and TCT<sub>1</sub> values ( $LC > LCT_0$ , but  $LC \leq LCT_1$  and  $TC \leq TCT_1$ ) are Type 3: Moderate Risk Wastes;
- (d) Wastes with all TC values less than twenty (20) times the LCT<sub>0</sub> value ( $TC < 20 \times LCT_0$ ), or wastes with all contaminant levels below both the LCT<sub>0</sub> and TCT<sub>0</sub> values ( $LC \leq LCT_0$  and  $TC \leq TCT_0$ ), are Type 4: Low Risk Wastes; or
- (e) Wastes with TC values less than twenty (20) times the TCT<sub>i</sub> value ( $TC < 20 \times TCT_i$ ) or wastes with all contaminant levels below the LCT<sub>i</sub> or TCT<sub>i</sub> values ( $LC \leq LCT_i$  or  $TC \leq TCT_i$ ) are Inert wastes.

(3) The level of risk associated with the disposal of each type of waste to landfill is as follows—

Criteria	Risk Level	Description of Risk associated with Disposal to Landfill
$LC > LCT_2$ , or $TC > TCT_2$	<b>Type 0: Very High Risk</b>	Considered very high risk waste with a very high potential for contaminant release. Requires very high level of control and ongoing management to protect health and the environment.
$LCT_1 < LC \leq LCT_2$ , or $TCT_1 < TC \leq TCT_2$	<b>Type 1: High Risk</b>	Considered high risk waste with high potential for contaminant release. Requires high level of control and ongoing management to protect health and the environment.
$TC \leq TCT_1$ and $LCT_0 < LC \leq LCT_1$	<b>Type 2: Moderate Risk</b>	Considered moderate risk waste with some potential for contaminant release. Requires proper control and ongoing management to protect health and the environment.

TC < 20 x LCT <sub>0</sub> , or LCT <sub>i</sub> < LC ≤ LCT <sub>0</sub> and TCT <sub>i</sub> < TC ≤ TCT <sub>0</sub>	<b>Type 3: Low Risk</b>	Low risk waste with low potential for contaminant release. Requires some level of control and ongoing management to protect health and the environment.
TC < 20 x LCT <sub>i</sub> , or LC ≤ LCT <sub>i</sub> , or TC ≤ TCT <sub>i</sub>	<b>Type 4: Very Low Risk – Inert Waste</b>	Very low risk waste that– (a) does not undergo any significant physical, chemical or biological transformation; (b) does not burn, react physically or chemically or otherwise affect any other matter with which it may come into contact; and (c) does not impact negatively on the environment because of its very low pollutant content and because the toxicity of its leachate is insignificant. Only basic control and management required.

(4) If a particular contaminant in a waste is not listed with corresponding LCT and TCT thresholds in Section 6 of this Standard, and the waste has been classified as hazardous in terms of SANS 10234 health or environmental hazards due to the hazard characteristics of the particular contaminant, the waste is considered to be Type 2: High Risk Waste.

(5) If a representative sample of a hazardous waste cannot be taken or obtained for accurate LC and TC analyses due to the nature of the waste, the waste is considered to be Type 2: High Risk Waste.



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