

Dolphin Coast Environmental and Laboratory Solutions (PTY) Limited



CLASSIFICATION REPORT

WASTE STREAM: Water from wash bay sump

REPORT NUMBER: KSIA008

VERSION: 0

Dolphin Coast Environmental and Laboratory Solutions (PTY) Limited



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ABSTRACT

As per South African National Standard for: Globally Harmonized System of Classification and Labelling of Chemicals (SANS 10234:2008); wash bay sump water has been analytically tested; the waste has been deemed a type 3 waste and if disposal is required it must be treated with ash and then sent to a Class A landfill site for disposal.

INTRODUCTION

Dolphin Coast Environmental and Laboratory Solutions (DCELS), has been appointed by King Shaka International Airport to develop a Safety Data Sheet on a waste stream generated by the company, namely: wash bay sump water. In addition, DCELS was requested to classify the waste stream in accordance to the guidance provided by the Waste Classification and Management Regulations Government Notice 634 of 2013. This is for King Shaka International Airport to understand the requirements for handling and disposal of the product. The samples of the waste were reviewed, classified and a Safety Data Sheet (SDS) was then developed in accordance with SANS 10234.

BACKGROUND

Samples were taken from King Shaka International Airport by DCELS in March 2016; samples placed in appropriate labelled containers and sent off to SANAS accredited laboratories for analysis as per the norms and standards.

BASIC ASSESSMENT METHODOLOGY

Analysis conducted was as per the National Norms and Standards stipulated in GNR 635. The total concentration was determined using the methodology of Aqua Regia extraction. The leach concentration had been determined using the Australian Standard Leaching Procedure (AS 4439.1, 4439.2 and 4439.3).

Total concentrations (TC) and leach concentrations (LC) of Chemical substances in waste must be determined as per the national norms and standards for the assessment of waste to landfill (GNR 635). Once the TC and LC are determined the results must be compared to the threshold limits. The Total Concentration threshold (TCT) and leachable concentration threshold (LCT) are stipulated in the regulations and are expressed as mg/kg and mg/l respectively.

Two parts are reviewed when determining the type of waste:

1. The TC is compared to three threshold values stipulated by the regulations that is; TCT0, TCT1 and TCT2. The threshold values were obtained from various sources such as the land remediation values, Environmental protection agency and SA soil screening values.

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- The LC is compared to four threshold values stipulated by the regulations that is; LCT0, LCT1, LCT2 and LCT3. The threshold values were obtained from various sources such as the standard for human effects listed for drinking water and World health organisation guidelines.

In order to determine the type of waste and class of landfill that the waste can be disposed of at, the TC and LC must be assessed as per table 1 below against the given threshold limits in the method listed below.

Table1 : Criteria used to determine the type of waste.

TYPE	THRESHOLD LIMITS
0	LC>LCT3 or TC>TCT2
1	LCT1 <LC ≤ LCT2 or TCT1 <TC ≤ TCT2
2	LCT1 <LC ≤ LCT2 and TC≤ TCT1
3	LCT0 <LC ≤ LCT1 and TC≤ TCT1
4	LC≤ LCT0 and TC≤ TCT0

CONCLUSION

The above report indicates that the waste stream received by DCELS for classification, has been subjected to analysis as per GNR 635.

The initial sample was deemed equivalent to a Type 0 waste and pre-treatment was required prior to disposal at a landfill site. The waste was deemed type 0 because of the high content of Di-2-ethylhexyl phthalate. (Annexure 1)

The sample was subjected to treatment with ash at a ratio of 2:1 and analysed for the specific determinant, after pre-treatment the waste is deemed a type 3 waste stream and can be disposed of at a Class A landfill site only. (Annexure 2)

RECOMMENDATIONS

Note: According to Government notice 634, classification results are valid for 5 years, if the process from which the product is derived from changes, the product and waste stream thereof has to be re-classified within 30 days from the change of process.

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ANNEXURE ONE

Total Concentration Threshold (TCT) Limits (mg/kg)				
Elements and Chemical Substances in Waste	TCT0	TCT1	TCT2	TC
METAL IONS				
As, Arsenic	5.8	5000	2000	2.4
B, Boron	150	15000	60000	28.32
Ba, Barium	62.5	6250	25000	956
Cd, Cadmium	7.5	260	1040	0.4
Co, Cobalt	50	5000	20000	10.4
Cr _{total} , Chromium Total	46000	800000	N/A	162.3
Cr(VI), Chromium (VI)	6.5	500	2000	0.3
Cu, Copper	16	19500	78000	63
Hg, Mercury	0.93	160	640	0.1
Mn, Manganese	1000	25000	100000	968
Mo, Molybdenum	40	1000	4000	1.9
Ni, Nickel	9	10600	42400	29.1
Pb, Lead	20	1900	7600	18
Sb, Antimony	10	75	300	5
Se, Selenium	10	50	200	1
V, Vanadium	150	2680	10720	33
Zn, Zinc	240	160000	640000	6338
INORGANIC ANIONS				
TDS				
Chloride				
Sulphate				
NO ₃ as N, Nitrate-N				
F, Fluoride	100	10000	40000	0.6
CN (Total), Cyanide Total	14	10500	42000	0.5
ORGANICS				
Benzene		10	40	0.03
Benzo(a)pyrene		1.7	40	0.01
Carbon tetrachloride		4	16	0.04
Chlorobenzene		8800	35200	0.03
Chloroform		700	2800	0.03
2-Chlorophenol		2100	8400	0.01
Di (2 ethylhexyl) phthalate		40	160	298.913
1,2-Dichlorobezene		31900	127600	0.04
1,4-Dichlorobenzene		18400	73600	0.04
1,2-Dichloroethane		3.7	14.8	0.06
1,1-Dichloroethylene		150	600	0.06
1-2-Dichloroethylene		3750	15000	0.6
Dichloromethane		16	64	0.25
2,4-Dichlorophenol		800	3200	0.01
2,4-Dinitrotoluene		5.2	20.8	0.01
Ethylbenzene		540	2160	0.03
Formaldehyde		2000	8000	8.4
Hexachlorobutadiene		2.8	5.4	0.01
Methyl ethyl ketone		8000	32000	1
MTBE (Methyl t-butyl ether)		1435	5740	0.02
Nitrobenzene		45	180	0.01
Petroleum H/Cs, C6 to C9		650	2600	0.3
Petroleum H/Cs, C10 to C36		10000	40000	10917
Phenols (total, non-halogenated)		560	2240	0.15
Polychlorinated biphenyls		12	48	0.05
Styrene		120	480	0.03
1,1,1,2-Tetrachloroethane		400	1600	0.03
1,1,2,2-Tetrachloroethane		5	20	0.03
Tetrachloroethylene		200	800	0.03
Toluene		1150	4600	0.03
Trichlorobenzenes (total)		3300	13200	0.14
1,1,1-Trichloroethane		1200	4800	0.03
1,1,2-Trichloroethane		48	192	0.03
Trichloroethylene		11600	46400	0.03
2,4,6-Trichlorophenol		1770	7080	0.01
Vinyl Chloride		1.5	6	0.02
Xylenes (total)		890	3560	0.08
PESTICIDES				
Aldrin + Dieldrin	0.05	1.2	4.8	1
DDT + DDD + DDE	0.05	50	200	2
2,4-D	0.05	120	480	10
Chlordane	0.05	4	16	2
Heptachlor	0.05	1.2	4.8	1

KEY	
Type 0	
Type 1	
Type 2	
Type 3	
Type 4	

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Leachable Concentration Threshold (LCT) Limits (mg/l)

Elements and Chemical Substances in Waste	LCT0	LCT1	LCT2	LCT3	LC	KEY
METAL IONS						Type 0
As, Arsenic	0.01	0.5	1	4	0.0025	Type 1
B, Boron	0.5	25	50	200	0.123	Type 2
Ba, Barium	0.7	35	70	280	0.022	Type 3
Cd, Cadmium	0.003	0.15	0.3	1.2	0.0005	Type 4
Co, Cobalt	0.5	25	50	200	0.012	
Cr _{Total} , Chromium Total	0.1	5	10	40	0.0015	
Cr(VI), Chromium (VI)	0.05	2.5	5	20	0.006	
Cu, Copper	2	100	200	800	0.007	
Hg, Mercury	0.006	0.3	0.6	2.4	0.001	
Mn, Manganese	0.5	25	50	200	2.108	
Mo, Molybdenum	0.07	3.5	7	28	0.002	
Ni, Nickel	0.07	3.5	7	28	0.023	
Pb, Lead	0.01	0.5	1	4	0.005	
Sb, Antimony	0.02	1	2	8	0.011	
Se, Selenium	0.01	0.5	1	4	0.003	
V, Vanadium	0.2	10	20	80	0.0115	
Zn, Zinc	5	250	500	2000	33.11	
INORGANIC ANIONS						
TDS	1000	12500	25000	100000	78.1	
Chloride	300	15000	30000	120000	5.7	
Sulphate	250	12500	25000	100000	77.56	
NO ₃ as N, Nitrate-N	11	550	1100	4400	0.86	
F, Fluoride	1.5	75	150	600	1.3	
CN (Total), Cyanide Total	0.07	3.5	7	28	0.01	
ORGANICS						
Benzene	0.01	0.02	0.08	0.0005		
Benzo(a)pyrene	0.035	0.07	0.28	0.001		
Carbon tetrachloride	0.2	0.4	1.6	0.002		
Chlorobenzene	5	10	40	0.002		
Chloroform	15	30	120	0.002		
2-Chlorophenol	15	30	120	0.001		
Di (2 ethylhexyl) phthalate	0.5	1	4	0.005		
1,2-Dichlorobenzene	5	10	40	0.003		
1,4-Dichlorobenzene	15	30	120	0.003		
1,2-Dichloroethane	1.5	3	12	0.002		
1,1-Dichloroethylene	0.35	0.7	2.8	0.003		
1,2-Dichloroethylene	2.5	5	20	0.006		
Dichloromethane	0.25	0.5	2	0.02		
2,4-Dichlorophenol	10	20	80	0.0005		
2,4-Dinitrotoluene	0.065	0.13	0.52	0.0005		
Ethylbenzene	3.5	7	28	0.0104		
Formaldehyde	25	50	200	0.5		
Hexachlorobutadiene	0.03	0.06	0.24	0.001		
Methyl ethyl ketone	100	200	800	0.1		
MTBE (Methyl t-butyl ether)	2.5	5	20	0.0001		
Nitrobenzene	1	2	8	0.001		
Petroleum H/Cs, C6 to C9	N/A	N/A	N/A			
Petroleum H/Cs, C10 to C36	N/A	N/A	N/A			
Phenols (total, non-halogenated)	7	14	56	0.1		
Polychlorinated biphenyls	0.025	0.05	0.2	0.0002		
Styrene	1	2	8	0.002		
1,1,1,2-Tetrachloroethane	5	10	40	0.002		
1,1,2,2-Tetrachloroethane	0.65	1.3	5.3	0.004		
Tetrachloroethylene	0.25	0.5	2	0.003		
Toluene	35	70	280	0.005		
Trichlorobenzenes (total)	3.5	7	28	0.006		
1,1,1-Trichloroethane	15	30	120	0.002		
1,1,2-Trichloroethane	0.6	1	4	0.002		
Trichloroethylene	0.25	2	8	0.003		
2,4,6-Trichlorophenol	10	20	80	0.001		
Vinyl Chloride	0.015	0.03	0.12	0.0001		
Xylenes (total)	25	50	200	0.0633		
PESTICIDES						
Aldrin + Dieldrin		0.015	0.03	0.03	0.00003	
DDT + DDD + DDE		1	2	2	0.0001	
2,4-D		1.5	3	3	0.0003	
Chlordane		0.05	0.1	0.1	0.00006	
Heptachlor		0.015	0.03	0.03	0.00003	

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ANNEXURE TWO

Total Concentration Threshold (TCT) Limits (mg/kg)

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METAL IONS					Type 0
As, Arsenic	5.8	5000	2000		Type 1
B, Boron	150	15000	60000		Type 2
Ba, Barium	62.5	6250	25000		Type 3
Cd, Cadmium	7.5	260	1040		Type 4
Co, Cobalt	50	5000	20000		
Cr _{total} , Chromium Total	46000	800000	N/A		
Cr(VI), Chromium (VI)	6.5	500	2000		
Cu, Copper	16	19500	78000		
Hg, Mercury	0.93	160	640		
Mn, Manganese	1000	25000	100000		
Mo, Molybdenum	40	1000	4000		
Ni, Nickel	9	10600	42400		
Pb, Lead	20	1900	7600		
Sb, Antimony	10	75	300		
Se, Selenium	10	50	200		
V, Vanadium	150	2680	10720		
Zn, Zinc	240	160000	640000		
INORGANIC ANIONS					
TDS					
Chloride					
Sulphate					
NO ₃ as N, Nitrate-N					
F, Fluoride	100	10000	40000		
CN (Total), Cyanide Total	14	10500	42000		
ORGANICS					
Benzene		10	40		
Benzo(a)pyrene		1.7	40		
Carbon tetrachloride		4	16		
Chlorobenzene		8800	35200		
Chloroform		700	2800		
2-Chlorophenol		2100	8400		
Di (2 ethylhexyl) phthalate		40	160	1.545	
1,2-Dichlorobenzene		31900	127600		
1,4-Dichlorobenzene		18400	73600		
1,2-Dichloroethane		3.7	14.8		
1,1-Dichloroethylene		150	600		
1-2-Dichloroethylene		3750	15000		
Dichloromethane		16	64		
2,4-Dichlorophenol		800	3200		
2,4-Dinitrotoluene		5.2	20.8		
Ethylbenzene		540	2160		
Formaldehyde		2000	8000		
Hexachlorobutadiene		2.8	5.4		
Methyl ethyl ketone		8000	32000		
MTBE (Methyl t-butyl ether)		1435	5740		
Nitrobenzene		45	180		
Petroleum H/Cs, C6 to C9		650	2600		
Petroleum H/Cs, C10 to C36		10000	40000		
Phenols (total, non-halogenated)		560	2240		
Polychlorinated biphenyls		12	48		
Styrene		120	480		
1,1,1,2-Tetrachloroethane		400	1600		
1,1,2,2-Tetrachloroethane		5	20		
Tetrachloroethylene		200	800		
Toluene		1150	4600		
Trichlorobenzenes (total)		3300	13200		
1,1,1-Trichloroethane		1200	4800		
1,1,2-Trichloroethane		48	192		
Trichloroethylene		11600	46400		
2,4,6-Trichlorophenol		1770	7080		
Vinyl Chloride		1.5	6		
Xylenes (total)		890	3560		
PESTICIDES					
Aldrin + Dieldrin	0.05	1.2	4.8		
DDT + DDD + DDE	0.05	50	200		
2,4-D	0.05	120	480		
Chlordane	0.05	4	16		
Heptachlor	0.05	1.2	4.8		