

6.4.8 Appendix D8: Soil Contamination Survey

11th February 2021

Dr. M. Cohen
CEN Integrated Environmental Management Unit
36 River Road
Walmer
6070

Dear Dr. Cohen

SOIL SAMPLING – SCREENING RESULTS

Thank you for affording us the opportunity to assist you with the environmental management program at the Swartkops Power Station, Port Elizabeth. The results of the sampling are attached.

If any further information is required, please feel free to contact me.

Thanking you



Digitally signed
by LAWtrust
AESignCA,
Melinda Venter

Melinda Venter

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INFORMATION PAGE

CLIENT NAME	CEN Integrated Environmental Management Unit
PHYSICAL ADDRESS	Swartkops Power Station, Port Elizabeth
CONTACT	Dr Mike Cohen
TYPE OF SERVICE	Soil Sampling
DATE OF SERVICE	12 th January 2021
PROJECT NUMBER	7829
SURVEY CONDUCTED AND REPORT COMPILED BY	Mr Deon Barrass
REPORT REVIEW BY	Ms Adele Pieterse
TECHNICAL REVIEW	Ms Melinda Venter

This report only pertains to the conditions found at the above address at the time of the survey. This report may not be copied electronically, physically or otherwise, except in its entirety. If sections of the report are to be copied the approval of the author, in writing, is required. Recommendations offered in this report are made in good faith with every effort to ensure the professional integrity thereof.


A description of the handling process for complaints and appeals are available to any interested party on request.



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Deon Barrass



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Adele Pieterse



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Melinda Venter

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ABBREVIATIONS AND DEFINITIONS

BDL	Below detection level
AIA	Approved Inspection Authority
LD	Lower detection limit
mg/kg	milligrams per kilogram
OHS Act	Occupational Health and Safety Act, Act 85 of 1993
ROHA	Registered Occupational Hygiene Assistant
ROHT	Registered Occupational Hygiene Technologist
ROH	Registered Occupational Hygienist
SAIOH	South African Institute for Occupational Hygiene
Words in the singular include the plural and vice versa, any gender includes the other genders and any natural person includes a juristic person.	

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EXECUTIVE SUMMARY

Safetech was requested by Dr B Clarke to conduct soil sampling at the Swartkops Power Station, Port Elizabeth.

This report evaluates sampling and observations made of the above site under the conditions, which prevailed on the date of the survey. Results and recommendations, made without prejudice, are contained in this report.

The soil screening results in the Informal Residential zone survey indicates that the analytes measured were all below the NEM: Waste Act - Soil Screening Guideline Values. The soil screening results in the All land-uses protective of the water resource zone survey indicated that the analytes measured were all below the NEM: Waste Act - Soil Screening Guideline Values except for the Manganese (Mn) analyte at sample point numbers 5, 6, 7 and the Lead (Pb) analyte at sample point numbers 2, 3, 4, 5, 6 and 7. The soil screening results in the Commercial / Industrial zone survey indicated that the analytes measured were all below the NEM: Waste Act - Soil Screening Guideline Values.

Assuring you of our best attention at all times.

Thanking you



Ms Melinda Venter

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SOIL SAMPLING

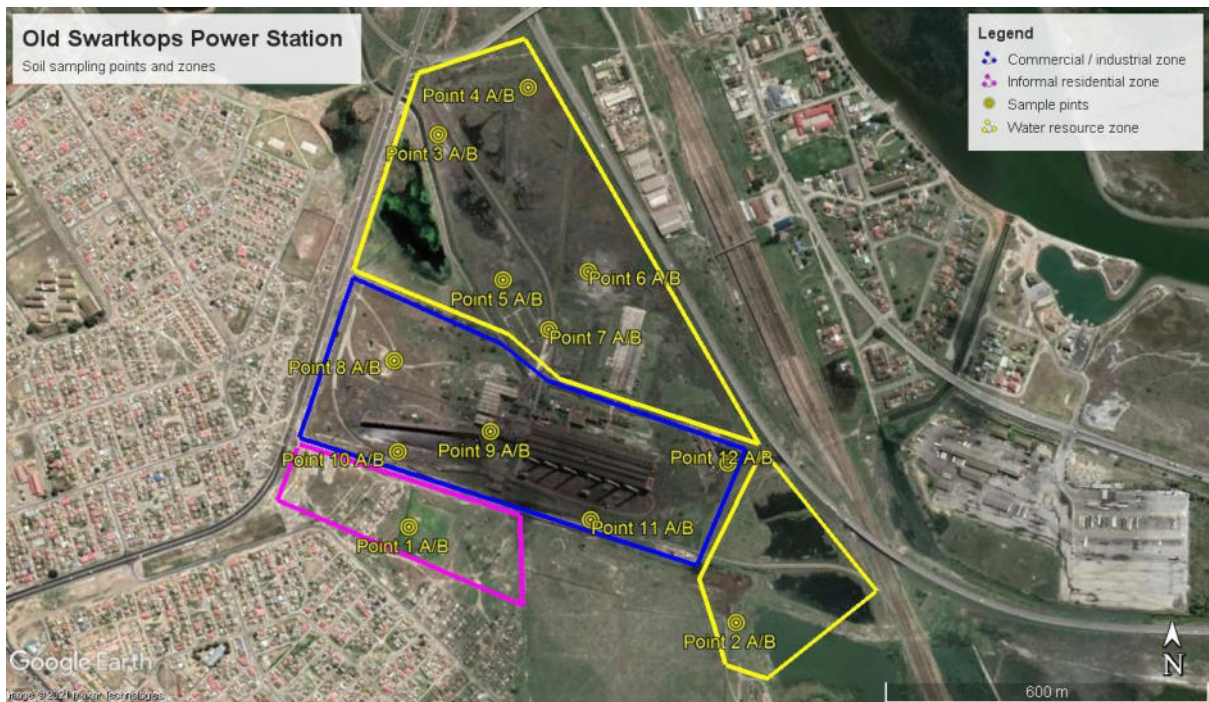
1.0 PURPOSE OF SURVEY

Safetech was requested by Dr B Clarke to conduct soil sampling at the Swartkops Old Power Station, Port Elizabeth.

2.0 LOCATION OF SAMPLING POINTS

The location of the sampling zones and locations can be found in Figure 1 below.

Figure 1: Soil sampling zones and points



A description of the NEM:WA zoning and the corresponding sample numbers can be found in in Table 1 below.

Table 1: NEM:WA Zone Description and corresponding sample numbers

Sample numbers	SSV1 All land-uses Protectives of the water resource	SSV2 Informal Residential	SSV2 Commercial / Industrial
Points 1		X	
Points 2,3,4,5,6,7	X		
Points 8,9,10,11,12			X

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3.0 SAMPLING METHODOLOGY

Samples were taken at the sampling points contained in Figure 1. Two samples were taken at each sampling point, with Sample A at the surface and Sample B between 400mm and 450mm deep. The samples were tested and analysed for several contaminants using EPA Methods. These were listed in the laboratory test report. The test results were compared to the standards contained in the National Environmental Management: Waste Act 59 of 2008 - National Norms and Standards for The Remediation of Contaminated Land And Soil Quality In The Republic Of South Africa (Published under Government Notice 331 in *Government Gazette* 37603 of 2 May 2014). The relevant Soil Screening Values for commercial and industrial premises are contained in Annexure A.

4.0 RESULTS

The results for the different zones (Informal Residential, All land use protective of water resource and Commercial / Industrial) are reflected in Tables 2, 3 and 4 below. The full names of the analytes are contained in Annexure B.

Table 2: Metal Results – SSV2 Informal Residential zone

SSV2 - Informal Residential - Soil Screening Value Limit (mg/kg)										
	23	15	46000	1100	0.93	740	620	110	150	9200
Results mg/kg										
Sample Number	As	Cd	Cr (Total)	Cu	Hg	Mn	Ni	Pb	V	Zn
Sample 1A	<4	<4	<4	<4	<0.1	84	<4	28	<4	34
Sample 1B	<4	<4	<4	<4	<0.1	38	<4	20	<4	<4
LOD* (mg/kg)	4	4	4	4	0.1	4	4	4	4	4

*LOD (Limit of Detection)

Table 3: Metal Results – SSV1 All land-uses protective of the water resource zone

SSV1 - All land-uses Protectives of the water resource - Soil Screening Value Limit (mg/kg)										
	5.8	7.5	46000	16	0.93	740	91	20	150	240
Results mg/kg										
Sample Number	As	Cd	Cr (Total)	Cu	Hg	Mn	Ni	Pb	V	Zn
Sample 2A	<4	<4	<4	<4	<0.1	140	<4	25	<4	44
Sample 2B	<4	<4	<4	<4	<0.1	46	<4	<4	<4	<4
Sample 3A	<4	<4	<4	<4	<0.1	358	<4	17	15	64

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SSV1 - All land-uses Protectives of the water resource - Soil Screening Value Limit (mg/kg)										
	5.8	7.5	46000	16	0.93	740	91	20	150	240
Results mg/kg										
Sample 3B	<4	<4	<4	<4	<0.1	441	<4	26	16	34
Sample 4B	<4	<4	<4	<4	<0.1	264	<4	44	<4	94
Sample 5A	<4	<4	<4	<4	<0.1	57	<4	<4	<4	<4
Sample 5B	<4	<4	<4	<4	<0.1	1 383	<4	21	17	115
Sample 6A	<4	<4	<4	<4	<0.1	37	<4	<4	<4	<4
Sample 6B	<4	<4	<4	<4	<0.1	1 981	<4	35	21	88
Sample 7A	<4	<4	<4	<4	<0.1	31	<4	<4	<4	<4
Sample 7B	<4	<4	<4	<4	<0.1	8 941	<4	28	19	67
LOD* (mg/kg)	4	4	4	4	0.1	4	4	4	4	4

*LOD (Limit of Detection)

Table 4: Metal Results – SSV2 Commercial / Industrial zone

SSV2 – Commercial / Industrial - Soil Screening Value Limit (mg/kg)										
	150	260	790000	19000	6.5	12000	10000	1900	2600	150000
Results mg/kg										
Sample Number	As	Cd	Cr (Total)	Cu	Hg	Mn	Ni	Pb	V	Zn
Sample 8A	<4	<4	<4	<4	<0.1	2 765	<4	51	<4	172
Sample 8B	<4	<4	<4	<4	<0.1	134	<4	25	<4	15
Sample 9A	<4	<4	<4	<4	<0.1	<4	<4	27	<4	25
Sample 9B	<4	<4	<4	<4	<0.1	58	<4	<4	<4	<4
Sample 10A	<4	<4	<4	<4	<0.1	2 655	<4	<4	<4	<4
Sample 10B	<4	<4	<4	<4	<0.1	42	<4	<4	<4	<4
Sample 11A	<4	<4	320	61	<0.1	<4	<4	61	21	933
Sample 11B	<4	<4	27	<4	<0.1	<4	<4	55	20	95
Sample 12A	81	<4	<4	<4	<0.1	529	<4	51	<4	100
Sample 12B	84	<4	109	183	<0.1	819	68	437	27	414
LOD* (mg/kg)	4	4	4	4	0.1	4	4	4	4	4

*LOD (Limit of Detection)

5.0 DISCUSSION AND CONCLUSION

Note that the “zones” as indicated in the tables of results and described below were determined by observing the topography, use and location of the sites/areas around the sample points.

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Soil screening - Informal Residential zone

The soil screening results in the Informal Residential zone survey indicated that the analytes measured were all below the NEM: Waste Act - Soil Screening Guideline Values.

Soil screening - All land-uses protective of the water resource zone

The soil screening results in the All land-uses protective of the water resource zone survey indicated that the analytes measured were all below the NEM: Waste Act - Soil Screening Guideline Values except for the Manganese (Mn) analyte at sample point numbers 5, 6, 7 and the Lead (Pb) analyte at sample point numbers 2, 3, 4, 5, 6 and 7.

The sub-surface Sample 5B, Manganese (Mn) analyte of **1383 mg/kg** exceeded the NEM:WA screening limit of **740 mg/kg**. The sub-surface Sample 6B, Manganese (Mn) analyte of **1981 mg/kg** exceeded the NEM:WA screening limit of **740 mg/kg** and the sub-surface Sample 7B, Manganese (Mn) analyte of **8941 mg/kg** exceeded the NEM:WA screening limit of **740 mg/kg**. The surface Sample 2A, Lead (Pb) analyte of **25 mg/kg** exceeded the NEM:WA screening limit of **20 mg/kg**. The sub-surface Sample 3B, Lead (Pb) analyte of **25 mg/kg** exceeded the NEM:WA screening limit of **20 mg/kg**. The surface Sample 4A, Lead (Pb) analyte of **44 mg/kg** exceeded the NEM:WA screening limit of **20 mg/kg**. The sub-surface Sample 5B, Lead (Pb) analyte of **21 mg/kg** exceeded the NEM:WA screening limit of **20 mg/kg**. The sub-surface Sample 6B, Lead (Pb) analyte of **35 mg/kg** exceeded the NEM:WA screening limit of **20 mg/kg**. The sub-surface Sample 7B, Lead (Pb) analyte of **28 mg/kg** exceeded the NEM:WA screening limit of **20 mg/kg**.

Soil screening - Commercial / Industrial zone

The soil screening results in the Commercial / Industrial zone survey indicated that the analytes measured were all below the NEM: Waste Act - Soil Screening Guideline Values.

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APPENDICES

ANNEXURE A – NEM: WA – SOIL SCREENING GUIDELINE VALUES

Parameter	Units	SSV1	SSV2	SSV2	SSV2
		All Land-Uses Protective of the Water Resource	Informal Residential	Standard Residential	Commercial/ Industrial
Metals and metalloids					
Arsenic	mg/kg	5,8	23	48	150
Cadmium	mg/kg	7,5	15	32	260
Chromium (III)	mg/kg	46 000	46 000	96 000	790 000
Chromium (VI)	mg/kg	6,5	6,5	13	40
Cobalt	mg/kg	300	300	630	5 000
Copper	mg/kg	16	1 100	2 300	19 000
Lead	mg/kg	20	110	230	1 900
Manganese	mg/kg	740	740	1 500	12 000
Mercury	mg/kg	0,93	0,93	1,0	6,5
Nickel	mg/kg	91	620	1 200	10 000
Vanadium	mg/kg	150	150	320	2 600
Zinc	mg/kg	240	9 200	19 000	150 000
Alkanes					
C7-C9	mg/kg	2 300	2 300	2 400	23 000
C10-C14	mg/kg	440	440	500	4 400
C15-C36	mg/kg	45 000	45 000	91 000	740 000
Monocyclic Aromatic Hydrocarbons					
Benzene	mg/kg	0,03	1,3	1,4	10
Toluene	mg/kg	25	120	120	1 100
Ethylbenzene	mg/kg	26	57	60	540
Xylenes	mg/kg	45	91	95	890
Aromatics					
Naphthalene	mg/kg	28	28	33	290
Pyrene	mg/kg	5,3	920	1 900	15 000