Seriti Power (Pty) Ltd

WASTE CLASSIFICATION AND ASSESSMENT

New Largo Colliery - Subsoil Samples

41105637
MAY 2024

CONFIDENTIAL

WASTE MANAGEMENT SUMMARY REPORT

WASTE IDENTIFICATION	Sample 3 – Subsoil 1
SOURCE	New Largo Coal (Pty) Ltd
DATE OF ASSESSMENT	March 2024

Relevant Regulations and Standards

- ✓ National Environmental Management: Waste Act (NEM: WA, 2008)
- ✓ National Environmental Management: Waste Amendment Act (NEM: WAA, 2014)
- ✓ National Environmental Management Laws Amendment Act (NEMLAA, 2022)
- ✓ Waste Classification and Management Regulations (GN R634 of 2013)
- ✓ Regulations for Hazardous Chemical Agents (GG 44366, 2021)
- ✓ National Norms and Standards for the Assessment of Waste to Landfill Disposal (GN R635 of 2013)
- ✓ National Norms and Standards for Disposal of Waste to Landfill (GN R636 of 2013)
- ✓ South African National Standard (SANS) 10234:2019, Globally Harmonised System of Classification and Labelling of Chemicals (GHS) (SANS 10234)
- ✓ South African National Standard (SANS) 11014:2010, Safety Data Sheet for Chemical Products – Content and Order of Sections (SANS 11014)

Scope

Included	Element	Description
✓	Defined and Listed Waste Appraisal	Desktop appraisal of whether the waste is defined under Schedule 3 of the NEM: WAA and/or listed in Annexure 1 of GN R634. Wastes either defined or listed do not necessarily require classification in terms of SANS 10234.
✓	Appraisal of Disposal Prohibitions	Determination of possible disposal prohibitions in terms of GN R636.
✓	Waste Type Profiling for Landfill Disposal	Profiling in accordance with GN R635 and/or Waste Acceptance Criteria as detailed in GN R636.
✓	Classification	Quantitative classification in broad accordance with SANS 10234.
×	Safety Data Sheet	A Safety Data Sheet (SDS) is required for all hazardous waste (excluding Health Care Risk Waste) in terms of GN R634.

Waste Description

Process Origin	Chemical Inputs	Physical Characteristics
N4 and N12 highways between Bronkhorstspruit and eMalahleni towns	None known	Solid

Defined Waste Appraisal

Listed in Schedule 3 of NEM: WAA	Yes
Descriptor	Category A: Wastes resulting from exploration, mining quarrying, and physical and chemical treatment of minerals (a) wastes from mineral excavation.

1. The above descriptor also takes account of the proceeding classification

Listed Waste Appraisal

Listed in Annexure 1 of GN R634	**No**
Descriptor	Not applicable
2. Not categorically listed in GN R634	

Sampling and Laboratory Analysis

Sampler	Date	Comments
WSP	February 2023	Representative samples were collected by WSP and submitted for analysis.

Analytical Suite	Matrix	
	Total	**Leachate**
Metals and metalloids, as listed in GN R635		
Antimony, arsenic, barium, boron, cadmium, chromium (total and hexavalent), cobalt, copper, lead, manganese, mercury, molybdenum, nickel, selenium, vanadium, and zinc	✓	✓
Inorganics, as listed in GN R635		
Chloride, nitrate, sulphate, and Total Dissolved Solids	N/A	✓
Cyanide and fluoride	✓	✓
Organics, as listed in GN R635		
Benzene, toluene, ethylbenzene, and xylenes (BTEX)	×	×
Petroleum hydrocarbons	×	N/A
Polychlorinated Biphenyls (PCB)	×	×
Polycyclic Aromatic Hydrocarbons (PAH)	×	N/A
Volatile and Semi-Volatile Organic Compounds (VOC and SVOC)	×	×
Pesticides, as listed in GN R635		
Aldrin + Dieldrin	×	×
DDT + DDD + DDE	×	×
2,4-D	×	×
Chlordane	×	×
Heptachlor	×	×
General Parameters, to support classification and disposal restriction appraisal.		
Calorific Value	×	×
Flashpoint	×	×
Mineral Oil	×	×
Moisture Content	×	×
pH	✓	N/A
Total Organic Carbon (TOC)	×	×
Supplementary Parameters reasonably anticipated.		
Aluminium, calcium, iron, magnesium, potassium, sodium, and phosphorous	×	×

Notes to Laboratory Analysis

1. N/A – Not applicable
2. As per GN R635, leachate was prepared using reagent water applicable to a mono-disposal scenario.
3. Whilst not all the substances above are likely to be present, the suite represents those determinants listed within the variously applicable Norms and Standards alongside other parameters that are expected.
4. It should be noted that pesticides have been omitted from the analytical suite as it is unreasonable to suspect their presence within the stream.
5. Laboratory certificate of analysis provided within **Appendix A** including details of any analysis unable to be completed based on the sample matrix.

Appraisal of Disposal Prohibitions

Restrictive Condition	Description
None identified	N/A

Waste Type Profiling for Landfill Disposal[1]

Waste Type	Landfill Class
Type 3	Class C

1. Refer to **Appendix B** for indicative profiling assessment.
2. Type Profiling is based on consideration of total and leachate concentrations of substances published in Paragraph 6 of GN R635 and the appropriate landfill class is determined with reference to the Waste Acceptance Criteria in Paragraph 4 of GN R636.
3. While reference is made in GN R634 to the application of SANS 10234 classification to Waste Type Profiling, the then Department of Environmental Affairs (DEA) confirmed during stakeholder engagement that Hazard Statement Codes for transportation and handling are not intended to be utilised for Waste Type Profiling for landfill disposal.

SANS 10234 Classification

Hazardous	Non-Hazardous ✓

1. Refer to **Appendix C** for the quantitative screening classification.
2. Assumptions in terms of the chemical form (speciation) in which elemental components of the waste stream are likely to occur have generally been conservative considering plausible thermodynamic and mineralogical assemblages.
3. Where applicable to the sample medium, results of laboratory analysis have been corrected according to sample-specific moisture content.
4. Where SANS 10234 guidance is either not available, unclear, or relatively incomplete, cognisance has been taken of European Regulation (EC) No. 1272/2008 on the Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) that adopts, within the European community, the GHS as published by the United Nations Social and Economic Council.
5. Hazard Statement Codes for the substances have been sourced from either the supplement to SANS 10234:2008 Edition 1, Table 3.1 of Annex VI of the CLP Regulations, or the European Chemicals Agency, Classification & Labelling Inventory Database.
6. Cognisance must be taken of the need to reclassify the waste every five years, or if the generation process changes or, otherwise, if more data becomes available.

Safety Data Sheet

Required	No

Appendices

Appendix	Title
A	Laboratory Analytical Certificates
B	Type Profiling Assessment (GN R635/636)
C	Screening Material Classification (SANS 10234)

[1] Subject to any prohibitions

Waiver

The Waste Management Summary Report (Report) has been prepared by WSP Group Africa (Pty) Ltd (WSP) on behalf and at the request of Seriti Coal (Pty) Ltd (Client), to provide the Client with an understanding of the Relevant Documents.

Unless otherwise agreed by us in writing, we do not accept responsibility or legal liability to any person other than the Client for the contents of, or any omissions from, this Report.

To prepare this Report, we have reviewed only the documents and information provided to us by the Client or any third parties directed to provide information and documents to us by the Client. We have not reviewed any other documents in relation to this Report except where otherwise indicated.

Authorisation

Shameer Hareeparsad
Principal Associate
Shameer.Hareeparsad@wsp.com

Appendix A

LABORATORY ANALYTICAL CERTIFICATES

Client Name: WSP Group Africa
Reference: 21465149
Location: Seriti New Largo
Contact: Shameer Hareeparsad
EMT Job No: 23/107

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1	2	3	4	5	6	7	8	9	10	LOD/LOR	Units	Method No.
Sample ID	Sample A-Sandstone	Sample B-Shale	Sample C-Carbonaceous Shale	Sample D-Sandstone	Sample E-Sandstone	Sample1-Sandstone1	Sample2-Sandstone2	Sample3-Subsoil1	Sample4-Subsoil2	Sample5-Whiteish Softs			
Depth	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2			
COC No / misc													
Containers	B	B	B	B	B	B	B	B	B	B			
Sample Date	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023			
Sample Type	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023			
Antimony*	1	2	<1	<1	<1	1	3	3	2	2	<1	mg/kg	UK_TM30/UK_PM15
Arsenic*	6.9	6.5	1.4	6.1	4.5	5.3	4.1	3.8	8.8	11.5	<0.5	mg/kg	UK_TM30/UK_PM15
Barium*	116	150	99	99	170	571	136	121	472	388	<1	mg/kg	UK_TM30/UK_PM15
Cadmium*	<0.1	<0.1	<0.1	0.3	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	UK_TM30/UK_PM15
Chromium*	30.1	28.2	6.9	25.1	28.3	42.4	88.1	48.8	42.1	47.0	<0.5	mg/kg	UK_TM30/UK_PM15
Cobalt*	11.5	91.5	1.1	13.0	16.6	18.0	17.7	17.3	24.4	15.9	<0.5	mg/kg	UK_TM30/UK_PM15
Copper*	45	53	14	49	46	15	28	18	51	56	<1	mg/kg	UK_TM30/UK_PM15
Lead*	22	36	21	26	28	7	18	17	31	29	<5	mg/kg	UK_TM30/UK_PM15
Manganese*	730	1197	74	62	450	1662	496	576	818	387	<1	mg/kg	UK_TM30/UK_PM15
Mercury*	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	mg/kg	UK_TM30/UK_PM15
Molybdenum*	1.3	5.2	0.1	0.2	0.7	1.3	0.8	0.8	1.8	2.2	<0.1	mg/kg	UK_TM30/UK_PM15
Nickel*	22.7	144.0	5.1	15.2	27.3	19.9	29.4	29.8	43.0	41.0	<0.7	mg/kg	UK_TM30/UK_PM15
Selenium*	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	UK_TM30/UK_PM15
Vanadium*	49	65	11	26	91	20	68	56	72	64	<1	mg/kg	UK_TM30/UK_PM15
Boron (Aqua Regia Soluble)*	2.87	6.40	12.36	6.42	10.91	0.54	<0.25	<0.25	1.08	1.86	<0.25	mg/kg	UK_TM30/UK_PM15
Zinc*	131	159	<5	142	105	56	110	120	197	130	<5	mg/kg	UK_TM30/UK_PM15
Fluoride	0.7	1.5	0.7	0.5	1.0	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	SA_TM27/SA_PM20
Hexavalent Chromium*	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	UK_TM38/UK_PM20
Total Cyanide*	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	mg/kg	UK_TM89/UK_PM45

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: WSP Group Africa
Reference: 21465149
Location: Seriti New Largo
Contact: Shameer Hareeparsad
EMT Job No: 23/107

Report : ASLP (20:1) - Reagent Water

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1	2	3	4	5	6	7	8	9	10	LOD/LOR	Units	Method No.
Sample ID	Sample A-Sandstone	Sample B-Shale	Sample C-Carbonaceous Shale	Sample D-Sandstone	Sample E-Sandstone	Sample1-Sandstone1	Sample2-Sandstone2	Sample3-Subsoil1	Sample4-Subsoil2	Sample5-Whiteish Softs			
Depth	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2			
COC No / misc													
Containers	B	B	B	B	B	B	B	B	B	B			
Sample Date	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023			
Sample Type	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023			
Dissolved Antimony*	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	UK_TM30/UK_PM14
Dissolved Arsenic*	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	ug/l	UK_TM30/UK_PM14
Dissolved Barium*	289	257	214	229	161	272	231	274	246	272	<3	ug/l	UK_TM30/UK_PM14
Dissolved Boron*	20	22	15	21	24	50	69	63	88	72	<12	ug/l	UK_TM30/UK_PM14
Dissolved Cadmium*	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	UK_TM30/UK_PM14
Dissolved Chromium*	<1.5	<1.5	<1.5	<1.5	<1.5	2.1	<1.5	<1.5	1.9	2.7	<1.5	ug/l	UK_TM30/UK_PM14
Dissolved Cobalt*	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	UK_TM30/UK_PM14
Dissolved Copper*	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/l	UK_TM30/UK_PM14
Dissolved Lead*	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	UK_TM30/UK_PM14
Dissolved Manganese*	<2	<2	<2	<2	<2	34	<2	<2	<2	<2	<2	ug/l	UK_TM30/UK_PM14
Dissolved Mercury*	<1	<1	<1	<1	<1	<1	<1	2	<1	<1	<1	ug/l	UK_TM30/UK_PM14
Dissolved Molybdenum*	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	UK_TM30/UK_PM14
Dissolved Nickel*	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	UK_TM30/UK_PM14
Dissolved Selenium*	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	UK_TM30/UK_PM14
Dissolved Vanadium*	1.7	<1.5	<1.5	2.4	<1.5	<1.5	<1.5	3.2	2.0	3.9	<1.5	ug/l	UK_TM30/UK_PM14
Dissolved Zinc*	7	11	10	11	14	20	14	17	12	18	<3	ug/l	UK_TM30/UK_PM14
Fluoride	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/l	SA_TM27/SA_PM0
Chloride	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.4	0.4	<0.3	<0.3	<0.3	mg/l	SA_TM27/SA_PM0
Sulphate	2.9	1.9	1.2	3.1	0.8	2.7	2.9	2.4	2.7	2.5	<0.5	mg/l	SA_TM27/SA_PM0
Nitrate as N	0.07	<0.05	<0.05	0.11	<0.05	<0.05	0.09	0.07	<0.05	<0.05	<0.05	mg/l	SA_TM27/SA_PM0
Total Cyanide*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	UK_TM89/UK_PM0
Hexavalent Chromium*	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	mg/l	UK_TM38/UK_PM0
Total Dissolved Solids	<35	<35	<35	38	<35	65	36	102	136	84	<35	mg/l	SA_TM20/SA_PM80
pH	6.99	6.98	7.91	8.58	7.36	7.78	7.28	8.65	8.13	7.88	<2.00	pH units	SA_TM19/SA_PM0

Please see attached notes for all abbreviations and acronyms

Client Name: WSP Group Africa
Reference: 21465149
Location: Seriti New Largo
Contact: Shameer Hareeparsad

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 23/107						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/107

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 23/107

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
SA_TM19	Determination of pH by bench pH meter	SA_PM0	No preparation is required.			AR	No
SA_TM20	Modified BS 1377-3: 1990 Gravimetric determination of Total Dissolved Solids	SA_PM80	A 20:1 ratio of leaching fluid to as received soil, is leached for 18 hours. The client can choose to use any of the following leaching fluids a) deionised water b) pH5 c) pH 5/pH2.9 depending on pH of sample d) pH9.2			AR	No
SA_TM27	Major ions by Ion Chromatography	SA_PM0	No preparation is required.				
SA_TM27	Major ions by Ion Chromatography	SA_PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a orbital shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a orbital shaker.			AD	Yes
UK_TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	UK_PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.				No
UK_TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	UK_PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.				Yes
UK_TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	UK_PM0	No preparation is required.				No
UK_TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	UK_PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.				Yes
UK_TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	UK_PM0	No preparation is required.				No
UK_TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	UK_PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.				Yes

Appendix B

TYPE PROFILING

Waste Type Profiling and Disposal Prohibition Appraisal

Based on National Norms and Standards for the Assessment of Waste for Landfill Disposal (GN R635 of 2013) together with National Norms and Standards for Disposal of Waste to Landfill (GN R636 of 2013)

Source of Waste:	New Largo Coal (Pty) Ltd, N4 and N12 highways between Bronkhorstspruit and eMalahleni towns, Sample 3-Subsoil 1
Waste Matrix (Liquid / Solid):	Solid
Appraisal Date:	May 2023
Leachate Preparation (Solids Only):	Non-Putrescible (Mono-Disposal): Reagent Water

Substance	Concentration (ppm) - Solid/Total				Waste Type (based on TCTs only; subject to LCTs)	Concentration (ppm) - Leachate/Liquid					Waste Type (based on LCTs only; subject to TCTs)
	TCT0	TCT1	TCT2	Assessed Concentration		LCT0	LCT1	LCT2	LCT3	Assessed Concentration	
Metal Ions											
Arsenic	5.8	500	2000	3.8	Type 4	0.01	0.5	1	4		
Boron	150	15000	60000			0.5	25	50	200	0.063	Type 4
Barium	62.5	6250	25000	121	Type 3	0.7	35	70	280	0.274	Type 4
Cadmium	7.5	260	1040			0.003	0.15	0.3	1.2		
Cobalt	50	5000	20000	17.3	Type 4	0.5	25	50	200		
Chromium	46000	800000	-	48.8	Type 4	0.1	5	10	40		
Chromium (Hexavalent)	6.5	500	2000			0.05	2.5	5	20		
Copper	16	19500	78000	18	Type 3	2	100	200	800		
Mercury	0.93	160	640			0.006	0.3	0.6	2.4	0.002	Type 4
Manganese	1000	25000	100000	576	Type 4	0.5	25	50	200		
Molybdenum	40	1000	4000	0.8	Type 4	0.07	3.5	7	28		
Nickel	91	10600	42400	29.8	Type 4	0.07	3.5	7	28		
Lead	20	1900	7600	17	Type 4	0.01	0.5	1	4		
Antimony	10	75	300	3	Type 4	0.02	1	2	8		
Selenium	10	50	200			0.01	0.5	1	4		
Vanadium	150	2680	10720	56	Type 4	0.2	10	20	80	0.0032	Type 4
Zinc	240	160000	640000	120	Type 4	5	250	500	2000	0.017	Type 4
Inorganic Anions											
Total Dissolved Solids	-	-	-	Not Applicable		1000	12500	25000	100000	102	Type 4
Chloride	-	-	-	Not Applicable		300	15000	30000	120000	0.4	Type 4
Sulphate	-	-	-	Not Applicable		250	12500	25000	100000	2.4	Type 4
Nitrate	-	-	-	Not Applicable		11	550	1100	4400	0.3987	Type 4
Fluoride	100	10000	40000			1.5	75	150	600		
Cyanide	14	10500	42000			0.07	3.5	7	28		
Organics											
Benzene	-	10	40			-	0.01	0.02	0.08		
Benzo(a)pyrene	-	1.7	6.8			-	0.035	0.07	0.28		
Carbon tetrachloride	-	4	16			-	0.2	0.4	1.6		
Chlorobenzene	-	8800	35200			-	5	10	40		
Chloroform	-	700	2800			-	15	30	120		
2-Chlorophenol	-	2100	8400			-	15	30	120		
Bis(2-ethylhexyl)phthalate	-	40	160			-	0.5	1	4		
1,2-Dichlorobenzene	-	31900	127600			-	5	10	40		
1,4-Dichlorobenzene	-	18400	73600			-	15	30	120		
1,2-Dichloroethane	-	3.7	14.8			-	1.5	3	12		
1,1-Dichloroethene	-	150	600			-	0.35	0.7	2.8		
1,2-Dichloroethene	-	3750	15000			-	2.5	5	20		
Dichloromethane	-	16	64			-	0.25	0.5	2		
2,4-Dichlorophenol	-	800	3200			-	10	20	80		
2,4-Dinitrotoluene	-	5.2	20.8			-	0.065	0.13	0.52		
Ethylbenzene	-	540	2160			-	3.5	7	28		
Formaldehyde	-	2000	8000			-	25	50	200		
Hexachlorobutadiene	-	2.8	5.4			-	0.03	0.06	0.24		
Methyl Ethyl Ketone (2-Butanone)	-	8000	32000			-	100	200	800		
Methyl Tertiary Butyl Ether	-	1435	5740			-	2.5	5	20		
Nitrobenzene	-	45	180			-	1	2	8		
Total PAHs	-	50	200			-	-	-	-	Not Applicable	
>C6-C9	-	650	2600			-	-	-	-	Not Applicable	
>C10-C36	-	10000	40000			-	-	-	-	Not Applicable	
Phenol	-	560	2240			-	7	14	56		
Polychlorinated Biphenyls (PCBs)	-	12	48			-	0.025	0.05	0.2		
Styrene	-	120	480			-	1	2	8		
1,1,1,2-Tetrachloroethane	-	400	1600			-	5	10	40		
1,1,2,2-Tetrachloroethane	-	5	20			-	0.65	1.3	5.3		
Tetrachloroethene	-	200	800			-	0.25	0.5	2		
Toluene	-	1150	4600			-	35	70	280		
Trichlorobenzenes (Sum)	-	3300	13200			-	3.5	7	28		
1,1,1-Trichloroethane	-	1200	4800			-	15	30	120		
1,1,2-Trichloroethane	-	48	192			-	0.06	1	4		
Trichloroethene	-	11600	46400			-	0.25	2	8		
2,4,6-Trichlorophenol	-	1770	7080			-	10	20	80		
Vinyl chloride	-	1.5	6			-	0.015	0.03	0.12		
Xylenes (Sum)	-	890	3560			-	25	50	200		
Pesticides											
Aldrin + Dieldrin	0.05	1.2	4.8			-	0.015	0.03	0.03		
DDT + DDD + DDE	0.05	50	200			-	1	2	2		
2,4-Dichlorophenoxyacetic Acid (2,4-D)	0.05	120	480			-	1.5	3	3		
Chlordane	0.05	4	16			-	0.05	0.1	0.1		
Heptachlor	0.05	1.2	4.8			-	0.015	0.03	0.03		

Supplementary Consideration for Confirmation of Type 4 Waste Type

Organics	Concentration (mg/kg), unless stated: Threshold	Assessed Concentration	Satisfy Type 4
Metals (all concentrations <TCT0 & LCT0):		As above	No
Anions (all concentrations <TCT0 & LCT0):		As above	Yes
Total Organic Carbon	(%) 3		To Clarify
BTEX (Sum)	6		To Clarify
Polychlorinated Biphenyls (PCBs)	1		To Clarify
Mineral Oil (>C10-C40)	500		To Clarify
Pesticides			
Aldrin + Dieldrin	0.05		To Clarify
DDT + DDD + DDE	0.05		To Clarify
2,4-Dichlorophenoxyacetic Acid (2,4-D)	0.05		To Clarify
Chlordane	0.05		To Clarify
Heptachlor	0.05		To Clarify

Notes

1. The final waste type is determined from the most conservative type calculated for any individual substance, whether this be based on Total (TCT) or Leachable (LCT) concentrations.
2. Where a number of waste types are applicable for any given substance (i.e. the consideration of TCTs in isolation cannot result in a Type 4 profile), the final waste type is determined by considering both the TCT and LCT analytical data simultaneously.
3. Only where laboratory analysis has resulted in positive identification of substances (i.e. above laboratory limits of detection) have these been compared to their respective TCTs and LCTs (i.e. substances determined to be at concentrations less than laboratory limits of detection have been assumed to be absent).
4. Notwithstanding disposal prohibitions, profiling of liquid wastes is undertaken by comparing the analytical results obtained directly from the liquid media to the LCT thresholds given that liquid wastes cannot provide a leachate extract for analysis.

Overall Screened Waste Type *(notwithstanding potential disposal prohibitions, see below)*	Category of Landfill *(GN R636 of 2013)*
Type 3 Waste	**Class C / GLB+**

Physicochemical Disposal Prohibitions *(notwithstanding other potential restrictions associated with Waste Type)*

PCBs > 50ppm	PCBs (ppm):			Not assessed or less than laboratory limit of detection
Explosive, corrosive or oxidising according to SANS 10234			No	Not applicable
pH <6 or >12	pH:			Not assessed
Flashpoint <61° Celsius	Flashpoint (°C):			Not assessed
Moisture Content > 40%	Moisture Content (%):			Not assessed or 0%
Hazardous with Calorific Value >10MJ/kg	CV (MJ/kg):		No	Not applicable
Hazardous with Total Organic Carbon >6%	TOC (%):		No	Not applicable
Brine (high salt content) >5% TDS	TDS (%):	N/A	N/A	Not applicable to a solid waste
Leachable TDS >100 000mg/l	TDS (mg/l):	102	No	Not applicable

End of Waste Type Profiling and Disposal Prohibition Appraisal

Appendix C

CLASSIFICATION

Screening Material Classification (SANS 10234:2019; Edition 2)

WSP Reference:	41105637	**Prepared For:**	Seriti Coal (Pty) Ltd
Generator:	New Largo Coal (Pty) Ltd	**Assessment Date:**	May 2023
Source Address:	N4 and N12 highways between Bronkhorstspruit and eMalahleni towns		
Production Process:	Sample 3-Subsoil 1		

General Appearance	Classification Summary
Soil	**Not Hazardous (General)**

Potential Hazard Statement Codes of Relevance

Composition & Quantitative Classification

Composition assessed in general accordance with the following hierarchy:
1. *South African National Standard, Globally Harmonised System of Classification and Labelling of Chemicals (GHS), SANS 10234:2019, Edition 2*
2. *European Regulation (EC) No. 1272/2008, 'Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation)*

Hazard Statement Codes for individual compounds are sourced from:
1. Supplement to SANS 10234:2008 Edition 1
2. Table 3.1 of Annex VI of the CLP Regulations
3. European Chemicals Agency, Classification & Labelling Inventory Database
4. Product (Material) Safety Data Sheet

Where relevant, recorded concentrations have been converted from dry weight values to account for the recorded moisture content of material.

Quantitative screening assessment of individual Hazard Statement Codes presented on the following pages.

Hazard Statement Code	Hazard Statement	Generic Cut-Off Value (%)	Generic Cut-Off Value (ppm)	Generic Cut-Off Value and Test Comments	Assessment Concentration (ppm)	Outcome(s) of Further Testing	Hazardous (Yes / No)	Additional Comments
PHYSICAL HAZARD STATEMENTS								
H200	**Unstable explosive**	0	0	If >0% then classified under H200 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H201	**Explosive; mass explosion hazard**	0	0	If >0% then classified under H201 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H202	**Explosive; severe projection hazard**	0	0	If >0% then classified under H202 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H203	**Explosive; fire, blast or projection hazard**	0	0	If >0% then classified under H203 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H204	**Fire or projection hazard**	0	0	If >0% then classified under H204 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H205	**May mass explode in fire**	0	0	If >0% then classified under H205 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H220	**Extremely flammable gas**	0	0	If >0% then classified under H220 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H221	**Flammable gas**	0	0	If >0% then classified under H221 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H222	**Extremely flammable aerosol**	0	0	If >0% then classified under H222 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H223	**Flammable aerosol**	0	0	If >0% then classified under H223 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H224	**Extremely flammable liquid and vapour**	0	0	If >0% then classified under H224 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H225	**Highly flammable liquid and vapour**	0	0	If >0% then classified under H225 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H226	**Flammable liquid and vapour**	0	0	If >0% then classified under H226 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H227	**Combustible liquid**	0	0	If >0% then classified under H227 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H228	**Flammable solid**	0	0	If >0% then classified under H228 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H229	**Pressurised container: may burst if heated**	0	0	Relevant only for pressurised containers	Not applicable	Not applicable	No	
H230	**May react explosively even in the absence of air**	0	0	If >0% then classified under H230 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H231	**May react explosively even in the absence of air at elevated pressure and/or temperature**	0	0	If >0% then classified under H231 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H240	**Heating may cause an explosion**	0	0	If >0% then classified under H240 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H241	**Heating may cause a fire or explosion**	0	0	If >0% then classified under H241 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H242	**Heating may cause a fire**	0	0	If >0% then classified under H242 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	

Hazard Statement Code	Hazard Statement	Generic Cut-Off Value (%)	Generic Cut-Off Value (ppm)	Generic Cut-Off Value and Test Comments	Assessment Concentration (ppm)	Outcome(s) of Further Testing	Hazardous (Yes / No)	Additional Comments
H250	**Catches fire spontaneously if exposed to air**	0	0	If >0% then classified under H250 unless further information and/or testing proves otherwise	60.00	Potential to catch fire spontaneously if exposed to air: detailed assessment required	Not likely at recorded concentration	
H251	**Self-heating; may catch fire**	0	0	If >0% then classified under H251 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H252	**Self-heating in large quantities; may catch fire**	0	0	If >0% then classified under H252 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H260	**In contact with water releases flammable gases that may ignite spontaneously**	0	0	If >0% then classified under H260 unless further information and/or testing proves otherwise	30.00	Assessment, see below	Substance-specific assessments: see below	
		0.0076	76.1	***Element-specific assessment*** Concentration of aluminium phosphide required to evolve sufficient volume of phosphine in contact with water to potentially render hazardous; based on stoichiometry	No analysis for aluminium	Not applicable	No	
		0.108	1076	***Element-specific assessment*** Concentration of free magnesium required to evolve sufficient volume of hydrogen in contact with water to potentially render hazardous; based on stoichiometry	No analysis for magnesium	Not applicable	No	
		0.346	3463	***Element-specific assessment*** Concentration of free potassium required to evolve sufficient volume of hydrogen in contact with water to potentially render hazardous; based on stoichiometry	No analysis for potassium	Not applicable	No	
		0.204	2036	***Element-specific assessment*** Concentration of free sodium required to evolve sufficient volume of hydrogen in contact with water to potentially render hazardous; based on stoichiometry	No analysis for sodium	Not applicable	No	
H261	**In contact with water releases flammable gas**	0	0	If >0% then classified under H261 unless further information and/or testing proves otherwise	60.50	Assessment, see below	Substance-specific assessments: see below	
		0.608	6082	***Element-specific assessment*** Concentration of free barium required to evolve sufficient volume of hydrogen in contact with water to potentially render hazardous; based on stoichiometry	121.00	Unlikely to generate hazardous volume of hydrogen	No	
		0.177	1775	***Element-specific assessment*** Concentration of free calcium required to evolve sufficient volume of hydrogen in contact with water to potentially render hazardous; based on stoichiometry	No analysis for calcium	Not applicable	No	

Hazard Statement Code	Hazard Statement	Generic Cut-Off Value (%)	Generic Cut-Off Value (ppm)	Generic Cut-Off Value and Test Comments	Assessment Concentration (ppm)	Outcome(s) of Further Testing	Hazardous (Yes / No)	Additional Comments
		0	0	***Compound-specific assessment*** Ferrosilicon may evolve sufficient hydrogen in contact with water to render hazardous; based on ratio of iron:silicon	Ferrosilicon not identified	Not applicable	No	

Hazard Statement Code	Hazard Statement	Generic Cut-Off Value (%)	Generic Cut-Off Value (ppm)	Generic Cut-Off Value and Test Comments	Assessment Concentration (ppm)	Outcome(s) of Further Testing	Hazardous (Yes / No)	Additional Comments
H270	May cause or intensify fire; oxidiser	0	0	If >0% then classified under H270 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H271	May cause fire or explosion; strong oxidiser	0	0	If >0% then classified under H271 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H272	May intensify fire; oxidiser	0	0	If >0% then classified under H272 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H280	Contains gas under pressure; may explode if heated	0	0	If >0% then classified under H280 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H281	Contains refrigerated gas; may cause cryogenic burns or injury	0	0	If >0% then classified under H281 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H290	May be corrosive to metals	0	0	If contributing substance >0% then conservatively classified under H290 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
HEALTH HAZARD STATEMENTS								
H300	Fatal if swallowed	1	10000	If cumulative/additive concentrations of contributing substances >1% then conservatively classified under H300 (Category 1 Acute Toxicity: Oral); pending further assessment	No substances identified	Not applicable	No	
H301	Toxic if swallowed	1	10000	If individual substance concentration >1% then conservatively classified under H301 (Category 3 Acute Toxicity: Oral); pending further assessment	3.80	Further assessment not necessary	No	
H302	Harmful if swallowed	1	10000	If individual substance concentration >1% then conservatively classified under H302 (Category 4 Acute Toxicity: Oral); pending further assessment	No substances identified	Not applicable	No	
H303	May be harmful if swallowed	1	10000	If individual substance concentration >1% then conservatively classified under H303 (Category 5 Acute Toxicity: Oral); pending further assessment	No substances identified	Not applicable	No	
H304	May be fatal if swallowed and enters airways	10	100000	If cumulative/additive concentrations of contributing substances ≥10% then conservatively classified under H304 (Aspiration Hazard, Category 1); pending further assessment	No substances identified	Not applicable	No	
H305	May be harmful if swallowed and enters airways	10	100000	If cumulative/additive concentrations of contributing substances ≥10% classified under H305 (Aspiration Hazard, Category 2); pending further assessment	No substances identified	Not applicable	No	
H310	Fatal in contact with skin	1	10000	If cumulative/additive >1% classified under H310 (Category 1 Acute Toxicity); pending further assessment	No substances identified	Not applicable	No	
H311	Toxic in contact with skin	1	10000	If individual substance >1% classified under H311 (Category 3 Acute Toxicity); pending further assessment	No substances identified	Not applicable	No	

Hazard Statement Code	Hazard Statement	Generic Cut-Off Value (%)	Generic Cut-Off Value (ppm)	Generic Cut-Off Value and Test Comments	Assessment Concentration (ppm)	Outcome(s) of Further Testing	Hazardous (Yes / No)	Additional Comments
H312	**Harmful in contact with skin**	1	10000	If individual substance >1% classified under H312 (Category 4 Acute Toxicity); pending further assessment	No substances identified	Not applicable	No	
H313	**May be harmful in contact with skin**	1	10000	If individual substance >1% classified under H313 (Category 5 Acute Toxicity); pending further assessment	No substances identified	Not applicable	No	
H314	**Causes severe skin burns and eye damage**	1	10000	If cumulative/additive >1% classified under H314 (Category 1 Skin Corrosion/Irritant); pending further assessment	No substances identified	Not applicable	No	
		≤2 pH Units ≥11.5		***pH-specific assessment*** If ≤2 or ≥11.5 pH then classified as corrosive	pH not determined	Not applicable	Unclarified	
H315	**Causes skin irritation**	1	10000	If cumulative/additive >1% classified under H315 (Category 3 Skin Corrosion/Irritant), >10% then Category 2; pending further assessment	121.00	Further assessment not necessary	No	
H316	**Causes mild skin irritation**	10	100000	If cumulative/additive >10% classified under H316 (Category 3 Skin Corrosion/Irritant); pending further assessment	No substances identified	Not applicable	No	
H317	**May cause an allergic skin reaction**	0.1	1000	If individual substance ≥0.1% classified under H317 (Category 1 Skin Sensitisation); pending further assessment	29.80	Further assessment not necessary	No	
H318	**Causes serious eye damage**	1	10000	If cumulative/additive >1% classified under H318 (Category 2 Skin/Eye Sensitisation); pending further assessment	No substances identified	Not applicable	No	
H319	**Causes serious eye irritation**	10	100000	If cumulative/additive >10% classified under H319 (Category 2 Eye Sensitisation); pending further assessment	121.00	Further assessment not necessary	No	
H320	**Causes eye irritation**	10	100000	If cumulative/additive >10% classified under H320 (Category 2 Eye Sensitisation); pending further assessment	No substances identified	Not applicable	No	
H330	**Fatal if inhaled**	1	10000	If cumulative/additive >1% classified under H330 (Category 1 Acute Toxicity); pending further assessment	No substances identified	Not applicable	No	
H331	**Toxic if inhaled**	1	10000	If individual substance >1% classified under H331 (Category 3 Acute Toxicity); pending further assessment	3.80	Further assessment not necessary	No	
H332	**Harmful if inhaled**	1	10000	If individual substance >1% classified under H332 (Category 4 Acute Toxicity); pending further assessment	No substances identified	Not applicable	No	
H333	**May be harmful if inhaled**	1	10000	If individual substance >1% classified under H333 (Category 5 Acute Toxicity); pending further assessment	No substances identified	Not applicable	No	
H334	**May cause allergy or asthma symptoms or breathing difficulties if inhaled**	0.1	1000	If individual substance >0.1% classified under H334 (Category 1 Respiratory Sensitisation); pending further assessment	17.30	Further assessment not necessary	No	
H335	**May cause respiratory irritation**	20	200000	If cumulative/additive >20% classified under H335 under Generic Limits; pending further assessment	121.00	Further assessment not necessary	No	

Hazard Statement Code	Hazard Statement	Generic Cut-Off Value (%)	Generic Cut-Off Value (ppm)	Generic Cut-Off Value and Test Comments	Assessment Concentration (ppm)	Outcome(s) of Further Testing	Hazardous (Yes / No)	Additional Comments
H336	**May cause drowsiness or dizziness**	20	200000	If cumulative/additive >20% classified under H336 under Generic Limits; pending further assessment	No substances identified	Not applicable	No	
H340	**May cause genetic defects**	0.1	1000	If individual substance >0.1% classified under H340 (Category 1 Mutagen); pending further assessment	No substances identified	Not applicable	No	
H341	**Suspected of causing genetic defects**	1	10000	If individual substance >1% classified under H341 (Category 2 Mutagen); pending further assessment	No substances identified	Not applicable	No	
H350	**May cause cancer**	0.1	1000	If individual substance >0.1% classified under H350 (Category 1 Carcinogen); pending further assessment	No substances identified	Not applicable	No	
H351	**Suspected of causing cancer**	0.1	1000	If individual substance >0.1% classified under H351 (Category 2 Carcinogen); pending further assessment	29.80	Further assessment not necessary	No	
H360	**May damage fertility or the unborn child**	0.1	1000	If individual substance >0.1% classified under H360 (Category 1 Teratogen); pending further assessment	No substances identified	Not applicable	No	
H361	**Suspected of damaging fertility or the unborn child**	0.1	1000	If individual substance >0.1% classified under H361 (Category 2 Teratogen); pending further assessment	No substances identified	Not applicable	No	
H361d	**Suspected of damaging the unborn child**	0.1	1000	If individual substance >0.1% classified under H361d; pending further assessment	No substances identified	Not applicable	No	
H362	**May cause harm to breast-fed children**	0.1	1000	If individual substance >0.1% classified under H362 (Additional Category Teratogen); pending further assessment	No substances identified	Not applicable	No	
H370	**Causes damage to organs**	1	10000	If individual substance >1% classified under H370 (Category 1 Single Exposure); pending further assessment	No substances identified	Not applicable	No	
H371	**May cause damage to organs**	1	10000	If individual substance >1% classified under H371 (Category 2 Single Exposure); pending further assessment	No substances identified	Not applicable	No	
H372	**Causes damage to organs through prolonged or repeated exposure**	1	10000	If individual substance >1% classified under H372 (Category 1 Repeat Exposure); pending further assessment	29.80	Further assessment not necessary	No	
H373	**May cause damage to organs through prolonged or repeated exposure**	1	10000	If individual substance >1% classified under H373 (Category 2 Repeat Exposure); pending further assessment	No substances identified	Not applicable	No	
		0.005	50	***PCB-specific assessment*** If PCBs are present >0.005% then classified hazardous under H373	No analysis for PCBs	Not applicable	Unclarified: not anticipated	
ENVIRONMENTAL HAZARD STATEMENTS								
H400	**Very toxic to aquatic life**	1	10000	If cumulative/additive >1% classified under H400 (Category 1 Acute Aquatic Toxicity); pending further assessment	123.80	Further assessment not necessary	No	
H401	**Toxic to aquatic life**	25	250000	If modified cumulative/additive >25% classified under H401 (Category 2 Acute Aquatic Toxicity); pending further assessment	1238.00	Further assessment not necessary	No	

Hazard Statement Code	Hazard Statement	Generic Cut-Off Value (%)	Generic Cut-Off Value (ppm)	Generic Cut-Off Value and Test Comments	Assessment Concentration (ppm)	Outcome(s) of Further Testing	Hazardous (Yes / No)	Additional Comments
H402	**Harmful to aquatic life**	25	250000	If modified cumulative/additive >25% classified under H402 (Category 3 Acute Aquatic Toxicity); pending further assessment	12380.00	Further assessment not necessary	No	
H410	**Very toxic to aquatic life with long lasting effects**	1	10000	If cumulative/additive >1% classified under H410 (Category 1 Chronic Aquatic Toxicity); pending further assessment	123.80	Further assessment not necessary	No	
H411	**Toxic to aquatic life with long lasting effects**	25	250000	If modified cumulative/additive >25% classified under H411 (Category 2 Chronic Aquatic Toxicity); pending further assessment	1238.00	Further assessment not necessary	No	
H412	**Harmful to aquatic life with long lasting effects**	25	250000	If modified cumulative/additive >25% classified under H412 (Category 3 Chronic Aquatic Toxicity); pending further assessment	12412.80	Further assessment not necessary	No	
H413	**May cause long lasting harmful effects to aquatic life**	25	250000	If modified cumulative/additive >25% classified under H413 (Category 4 Chronic Aquatic Toxicity); pending further assessment	173.90	Further assessment not necessary	No	
H420	**Harms public health and the environment by destroying ozone in the upper atmosphere**	0.1	1000	If individual substance >0.1% classified under H420 (Category 1). Substances based on Annexes to the Montreal Protocol.	No substances identified	Not applicable	No	

Assumptions and Comments

1. Acute Toxicity Estimates (ATE) have not been derived from LD50 data or conversion factors presented in SANS 10234; screening classification has been based on generic cut-off values. Where more detailed assessment is recommended, appropriate LD50 should be sourced based on current available data.

2. Ecotoxicity for Category 1 Acute and Chronic Hazards have assumed 1% threshold and additive compounds rather than utilisation of Weighting Factor/s presented in SANS 10234. Where more detailed assessment is recommended, this should follow the mixture-specific principles defined in SANS 10234.

3. Classification does not include European Union (EU), or other territory-specific, Hazard Statement Codes that may be applicable outside of the Republic of South Africa.

4. Only where data is presented, or where laboratory analysis has resulted in positive identification of substances (i.e. above laboratory limits of detection), have the applicable Hazard Statement Codes been appraised (i.e. substances determined to be at concentrations less than laboratory limits of detection have been assumed to be absent).

5. Unless exact speciation has been established through detailed analysis, classification has been based on reasonable assumptions of substances most-likely present based on expected behaviour within the material. It is recognised that this may not be applicable in all instances and, for clarity, a list of the individual substances appraised where assumptions have been made are listed below.

6. Where laboratory analysis has reported concentrations on a dry weight basis these have been converted to take account of sample moisture content using the formula:
Wet Weight Concentration = Dry Weight Concentration x ((100 - %moisture content)/100).

7. Where assessment has been undertaken on liquids, it has been assumed that 1-litre (volume) is equivalent to 1-kg (mass).

8. For additional details in respect of the individual substances that may render any given material type as hazardous, reference should be made to the appropriate Safety Data Sheet (SDS) which takes account of this classification or, if an SDS has not been prepared, the appropriate report relevant for this classification.

9. To the best of our knowledge, the information contained herein is accurate; however, WSP assumes no liability whatsoever for its accuracy or completeness. The classification of any material, and its appropriate management, remains the responsibility of the generator. All materials may present unknown hazards. Although certain hazards are described herein, it cannot be guaranteed that these are the only hazards that exist, or that these have been recognised in full.

List of Assumed Substances, where necessary

Antimony, Arsenic, Barium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Vanadium, Zinc,

END

WASTE MANAGEMENT SUMMARY REPORT

WASTE IDENTIFICATION	Sample 4 – Subsoil 2
SOURCE	New Largo Coal (Pty) Ltd
DATE OF ASSESSMENT	March 2024

Relevant Regulations and Standards

- ✓ National Environmental Management: Waste Act (NEM: WA, 2008)
- ✓ National Environmental Management: Waste Amendment Act (NEM: WAA, 2014)
- ✓ National Environmental Management Laws Amendment Act (NEMLAA, 2022)
- ✓ Waste Classification and Management Regulations (GN R634 of 2013)
- ✓ Regulations for Hazardous Chemical Agents (GG 44366, 2021)
- ✓ National Norms and Standards for the Assessment of Waste to Landfill Disposal (GN R635 of 2013)
- ✓ National Norms and Standards for Disposal of Waste to Landfill (GN R636 of 2013)
- ✓ South African National Standard (SANS) 10234:2019, Globally Harmonised System of Classification and Labelling of Chemicals (GHS) (SANS 10234)
- ✓ South African National Standard (SANS) 11014:2010, Safety Data Sheet for Chemical Products – Content and Order of Sections (SANS 11014)

Scope

Included	Element	Description
✓	Defined and Listed Waste Appraisal	Desktop appraisal of whether the waste is defined under Schedule 3 of the NEM: WAA and/or listed in Annexure 1 of GN R634. Wastes either defined or listed do not necessarily require classification in terms of SANS 10234.
✓	Appraisal of Disposal Prohibitions	Determination of possible disposal prohibitions in terms of GN R636.
✓	Waste Type Profiling for Landfill Disposal	Profiling in accordance with GN R635 and/or Waste Acceptance Criteria as detailed in GN R636.
✓	Classification	Quantitative classification in broad accordance with SANS 10234.
×	Safety Data Sheet	A Safety Data Sheet (SDS) is required for all hazardous waste (excluding Health Care Risk Waste) in terms of GN R634.

Waste Description

Process Origin	Chemical Inputs	Physical Characteristics
N4 and N12 highways between Bronkhorstspruit and eMalahleni towns	None known	Solid

Defined Waste Appraisal

Listed in Schedule 3 of NEM: WAA	Yes
Descriptor	Category A: Wastes resulting from exploration, mining quarrying, and physical and chemical treatment of minerals (a) wastes from mineral excavation.

1. The above descriptor also takes account of the proceeding classification

Listed Waste Appraisal

Listed in Annexure 1 of GN R634	**No**
Descriptor	Not applicable
2. Not categorically listed in GN R634	

Sampling and Laboratory Analysis

Sampler	Date	Comments
WSP	February 2023	Representative samples were collected by WSP and submitted for analysis.

Analytical Suite	Matrix	
	Total	**Leachate**
Metals and metalloids, as listed in GN R635		
Antimony, arsenic, barium, boron, cadmium, chromium (total and hexavalent), cobalt, copper, lead, manganese, mercury, molybdenum, nickel, selenium, vanadium, and zinc	✓	✓
Inorganics, as listed in GN R635		
Chloride, nitrate, sulphate, and Total Dissolved Solids	N/A	✓
Cyanide and fluoride	✓	✓
Organics, as listed in GN R635		
Benzene, toluene, ethylbenzene, and xylenes (BTEX)	×	×
Petroleum hydrocarbons	×	N/A
Polychlorinated Biphenyls (PCB)	×	×
Polycyclic Aromatic Hydrocarbons (PAH)	×	N/A
Volatile and Semi-Volatile Organic Compounds (VOC and SVOC)	×	×
Pesticides, as listed in GN R635		
Aldrin + Dieldrin	×	×
DDT + DDD + DDE	×	×
2,4-D	×	×
Chlordane	×	×
Heptachlor	×	×
General Parameters, to support classification and disposal restriction appraisal.		
Calorific Value	×	×
Flashpoint	×	×
Mineral Oil	×	×
Moisture Content	×	×
pH	✓	N/A
Total Organic Carbon (TOC)	×	×
Supplementary Parameters, reasonably anticipated.		
Aluminium, calcium, iron, magnesium, potassium, sodium, and phosphorous	×	×

Notes to Laboratory Analysis

1. N/A – Not applicable
2. As per GN R635, leachate was prepared using reagent water applicable to a mono-disposal scenario.
3. Whilst not all the substances above are likely to be present, the suite represents those determinants listed within the variously applicable Norms and Standards alongside other parameters that are expected.
4. It should be noted that pesticides have been omitted from the analytical suite as it is unreasonable to suspect their presence within the stream.
5. Laboratory certificate of analysis provided within **Appendix A** including details of any analysis unable to be completed based on the sample matrix.

Appraisal of Disposal Prohibitions

Restrictive Condition	Description
None identified	N/A

Waste Type Profiling for Landfill Disposal[1]

Waste Type	Landfill Class
Type 3	Class C

1. Refer to **Appendix B** for indicative profiling assessment.
2. Type Profiling is based on consideration of total and leachate concentrations of substances published in Paragraph 6 of GN R635 and the appropriate landfill class is determined with reference to the Waste Acceptance Criteria in Paragraph 4 of GN R636.
3. While reference is made in GN R634 to the application of SANS 10234 classification to Waste Type Profiling, the then Department of Environmental Affairs (DEA) confirmed during stakeholder engagement that Hazard Statement Codes for transportation and handling are not intended to be utilised for Waste Type Profiling for landfill disposal.

SANS 10234 Classification

Hazardous	Non-Hazardous ✓

1. Refer to **Appendix C** for the quantitative screening classification.
2. Assumptions in terms of the chemical form (speciation) in which elemental components of the waste stream are likely to occur have generally been conservative considering plausible thermodynamic and mineralogical assemblages.
3. Where applicable to the sample medium, results of laboratory analysis have been corrected according to sample-specific moisture content.
4. Where SANS 10234 guidance is either not available, unclear, or relatively incomplete, cognisance has been taken of European Regulation (EC) No. 1272/2008 on the Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) that adopts, within the European community, the GHS as published by the United Nations Social and Economic Council.
5. Hazard Statement Codes for the substances have been sourced from either the supplement to SANS 10234:2008 Edition 1, Table 3.1 of Annex VI of the CLP Regulations, or the European Chemicals Agency, Classification & Labelling Inventory Database.
6. Cognisance must be taken of the need to reclassify the waste every five years, or if the generation process changes or, otherwise, if more data becomes available.

Safety Data Sheet

Required	No

Appendices

Appendix	Title
A	Laboratory Analytical Certificates
B	Type Profiling Assessment (GN R635/636)
C	Screening Material Classification (SANS 10234)

[1] Subject to any prohibitions

Waiver

The Waste Management Summary Report (Report) has been prepared by WSP Group Africa (Pty) Ltd (WSP) on behalf and at the request of Seriti Coal (Pty) Ltd (Client), to provide the Client with an understanding of the Relevant Documents.

Unless otherwise agreed by us in writing, we do not accept responsibility or legal liability to any person other than the Client for the contents of, or any omissions from, this Report.

To prepare this Report, we have reviewed only the documents and information provided to us by the Client or any third parties directed to provide information and documents to us by the Client. We have not reviewed any other documents in relation to this Report except where otherwise indicated.

Authorisation

Shameer Hareeparsad
Principal Associate
Shameer.Hareeparsad@wsp.com

Appendix A

LABORATORY ANALYTICAL CERTIFICATES

Element Materials Technology
Unit D2 & D5
9 Quantum Road
Firgrove Business Park
Somerset West
7130
South Africa

W: www.element.com

WSP Group Africa
Building C, Knightsbridge
33 Sloane Street
Bryanston
Johannesburg
Gauteng
South Africa
2191

Attention :	Shameer Hareeparsad
Date :	3rd March, 2023
Your reference :	21465149
Our reference :	Test Report 23/107 Batch 1
Location :	Seriti New Largo
Date samples received :	21st February, 2023
Status :	Final report
Issue :	1

Ten samples were received for analysis on 21st February, 2023 of which ten were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Analysis was undertaken at either Element Materials Technology UK, which is ISO 17025 accredited under UKAS (4225) or Element Materials Technology (SA) which is ISO 17025 accredited under SANAS (T0729) or a subcontract laboratory where specified.

NOTE: Under International Laboratory Accreditation Cooperation (ILAC), ISO 17025 (UKAS) accreditation is recognised as equivalent to SANAS (South Africa) accreditation.

Authorised By:

Jeanri Stevens
Laboratory Supervisor

Inorganics Laboratory:

Aubrey Lindi
Technical Signatory (Inorganics)

Client Name: WSP Group Africa
Reference: 21465149
Location: Seriti New Largo
Contact: Shameer Hareeparsad
EMT Job No: 23/107

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1	2	3	4	5	6	7	8	9	10	LOD/LOR	Units	Method No.
Sample ID	Sample A-Sandstone	Sample B-Shale	Sample C-Carbonaceous Shale	Sample D-Sandstone	Sample E-Sandstone	Sample1-Sandstone1	Sample2-Sandstone2	Sample3-Subsoil1	Sample4-Subsoil2	Sample5-Whiteish Softs			
Depth	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2			
COC No / misc													
Containers	B	B	B	B	B	B	B	B	B	B			
Sample Date	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023			
Sample Type	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023			
Antimony*	1	2	<1	<1	<1	1	3	3	2	2	<1	mg/kg	UK_TM30/UK_PM15
Arsenic*	6.9	6.5	1.4	6.1	4.5	5.3	4.1	3.8	8.8	11.5	<0.5	mg/kg	UK_TM30/UK_PM15
Barium*	116	150	99	99	170	571	136	121	472	388	<1	mg/kg	UK_TM30/UK_PM15
Cadmium*	<0.1	<0.1	<0.1	0.3	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	UK_TM30/UK_PM15
Chromium*	30.1	28.2	6.9	25.1	28.3	42.4	88.1	48.8	42.1	47.0	<0.5	mg/kg	UK_TM30/UK_PM15
Cobalt*	11.5	91.5	1.1	13.0	16.6	18.0	17.7	17.3	24.4	15.9	<0.5	mg/kg	UK_TM30/UK_PM15
Copper*	45	53	14	49	46	15	28	18	51	56	<1	mg/kg	UK_TM30/UK_PM15
Lead*	22	36	21	26	28	7	18	17	31	29	<5	mg/kg	UK_TM30/UK_PM15
Manganese*	730	1197	74	62	450	1662	496	576	818	387	<1	mg/kg	UK_TM30/UK_PM15
Mercury*	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	mg/kg	UK_TM30/UK_PM15
Molybdenum*	1.3	5.2	0.1	0.2	0.7	1.3	0.8	0.8	1.8	2.2	<0.1	mg/kg	UK_TM30/UK_PM15
Nickel*	22.7	144.0	5.1	15.2	27.3	19.9	29.4	29.8	43.0	41.0	<0.7	mg/kg	UK_TM30/UK_PM15
Selenium*	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	UK_TM30/UK_PM15
Vanadium*	49	65	11	26	91	20	68	56	72	64	<1	mg/kg	UK_TM30/UK_PM15
Boron (Aqua Regia Soluble)*	2.87	6.40	12.36	6.42	10.91	0.54	<0.25	<0.25	1.08	1.86	<0.25	mg/kg	UK_TM30/UK_PM15
Zinc*	131	159	<5	142	105	56	110	120	197	130	<5	mg/kg	UK_TM30/UK_PM15
Fluoride	0.7	1.5	0.7	0.5	1.0	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	SA_TM27/SA_PM20
Hexavalent Chromium*	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	UK_TM38/UK_PM20
Total Cyanide*	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	mg/kg	UK_TM89/UK_PM45

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: WSP Group Africa
Reference: 21465149
Location: Seriti New Largo
Contact: Shameer Hareeparsad
EMT Job No: 23/107

Report : ASLP (20:1) - Reagent Water

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1	2	3	4	5	6	7	8	9	10	LOD/LOR	Units	Method No.
Sample ID	Sample A-Sandstone	Sample B-Shale	Sample C-Carbonaceous Shale	Sample D-Sandstone	Sample E-Sandstone	Sample1-Sandstone1	Sample2-Sandstone2	Sample3-Subsoil1	Sample4-Subsoil2	Sample5-Whiteish Softs			
Depth	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2	0-2			
COC No / misc													
Containers	B	B	B	B	B	B	B	B	B	B			
Sample Date	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023	20/02/2023			
Sample Type	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023	21/02/2023			
Dissolved Antimony*	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	UK_TM30/UK_PM14
Dissolved Arsenic*	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	ug/l	UK_TM30/UK_PM14
Dissolved Barium*	289	257	214	229	161	272	231	274	246	272	<3	ug/l	UK_TM30/UK_PM14
Dissolved Boron*	20	22	15	21	24	50	69	63	88	72	<12	ug/l	UK_TM30/UK_PM14
Dissolved Cadmium*	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	UK_TM30/UK_PM14
Dissolved Chromium*	<1.5	<1.5	<1.5	<1.5	<1.5	2.1	<1.5	<1.5	1.9	2.7	<1.5	ug/l	UK_TM30/UK_PM14
Dissolved Cobalt*	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	UK_TM30/UK_PM14
Dissolved Copper*	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/l	UK_TM30/UK_PM14
Dissolved Lead*	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	UK_TM30/UK_PM14
Dissolved Manganese*	<2	<2	<2	<2	<2	34	<2	<2	<2	<2	<2	ug/l	UK_TM30/UK_PM14
Dissolved Mercury*	<1	<1	<1	<1	<1	<1	<1	2	<1	<1	<1	ug/l	UK_TM30/UK_PM14
Dissolved Molybdenum*	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	UK_TM30/UK_PM14
Dissolved Nickel*	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	UK_TM30/UK_PM14
Dissolved Selenium*	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	UK_TM30/UK_PM14
Dissolved Vanadium*	1.7	<1.5	<1.5	2.4	<1.5	<1.5	<1.5	3.2	2.0	3.9	<1.5	ug/l	UK_TM30/UK_PM14
Dissolved Zinc*	7	11	10	11	14	20	14	17	12	18	<3	ug/l	UK_TM30/UK_PM14
Fluoride	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/l	SA_TM27/SA_PM0
Chloride	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.4	0.4	<0.3	<0.3	<0.3	mg/l	SA_TM27/SA_PM0
Sulphate	2.9	1.9	1.2	3.1	0.8	2.7	2.9	2.4	2.7	2.5	<0.5	mg/l	SA_TM27/SA_PM0
Nitrate as N	0.07	<0.05	<0.05	0.11	<0.05	<0.05	0.09	0.07	<0.05	<0.05	<0.05	mg/l	SA_TM27/SA_PM0
Total Cyanide*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	UK_TM89/UK_PM0
Hexavalent Chromium*	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	mg/l	UK_TM38/UK_PM0
Total Dissolved Solids	<35	<35	<35	38	<35	65	36	102	136	84	<35	mg/l	SA_TM20/SA_PM80
pH	6.99	6.98	7.91	8.58	7.36	7.78	7.28	8.65	8.13	7.88	<2.00	pH units	SA_TM19/SA_PM0

Please see attached notes for all abbreviations and acronyms

Client Name: WSP Group Africa
Reference: 21465149
Location: Seriti New Largo
Contact: Shameer Hareeparsad

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 23/107						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/107

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 23/107

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
SA_TM19	Determination of pH by bench pH meter	SA_PM0	No preparation is required.			AR	No
SA_TM20	Modified BS 1377-3: 1990 Gravimetric determination of Total Dissolved Solids	SA_PM80	A 20:1 ratio of leaching fluid to as received soil, is leached for 18 hours. The client can choose to use any of the following leaching fluids a) deionised water b) pH5 c) pH 5/pH2.9 depending on pH of sample d) pH9.2			AR	No
SA_TM27	Major ions by Ion Chromatography	SA_PM0	No preparation is required.				
SA_TM27	Major ions by Ion Chromatography	SA_PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a orbital shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a orbital shaker.			AD	Yes
UK_TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	UK_PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.				No
UK_TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	UK_PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.				Yes
UK_TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	UK_PM0	No preparation is required.				No
UK_TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	UK_PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.				Yes
UK_TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	UK_PM0	No preparation is required.				No
UK_TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	UK_PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.				Yes

Appendix B

TYPE PROFILING

Waste Type Profiling and Disposal Prohibition Appraisal

Based on National Norms and Standards for the Assessment of Waste for Landfill Disposal (GN R635 of 2013) together with National Norms and Standards for Disposal of Waste to Landfill (GN R636 of 2013)

Source of Waste:	New Largo Coal (Pty) Ltd, N4 and N12 highways between Bronkhorstspruit and eMalahleni towns, Sample 4-Subsoil 2
Waste Matrix (Liquid / Solid):	Solid
Appraisal Date:	May 2023
Leachate Preparation (Solids Only):	Non-Putrescible (Mono-Disposal): Reagent Water

Substance	Concentration (ppm) - Solid/Total				Waste Type (based on TCTs only; subject to LCTs)	Concentration (ppm) - Leachate/Liquid					Waste Type (based on LCTs only; subject to TCTs)
	TCT0	TCT1	TCT2	Assessed Concentration		LCT0	LCT1	LCT2	LCT3	Assessed Concentration	
Metal Ions											
Arsenic	5.8	500	2000	8.8	Type 3	0.01	0.5	1	4		
Boron	150	15000	60000	1.08	Type 4	0.5	25	50	200	0.088	Type 4
Barium	62.5	6250	25000	472	Type 3	0.7	35	70	280	0.246	Type 4
Cadmium	7.5	260	1040			0.003	0.15	0.3	1.2		
Cobalt	50	5000	20000	24.4	Type 4	0.5	25	50	200		
Chromium	46000	800000	-	42.1	Type 4	0.1	5	10	40		
Chromium (Hexavalent)	6.5	500	2000			0.05	2.5	5	20		
Copper	16	19500	78000	51	Type 3	2	100	200	800		
Mercury	0.93	160	640			0.006	0.3	0.6	2.4		
Manganese	1000	25000	100000	818	Type 4	0.5	25	50	200		
Molybdenum	40	1000	4000	1.8	Type 4	0.07	3.5	7	28		
Nickel	91	10600	42400	43	Type 4	0.07	3.5	7	28		
Lead	20	1900	7600	31	Type 3	0.01	0.5	1	4		
Antimony	10	75	300	2	Type 4	0.02	1	2	8		
Selenium	10	50	200			0.01	0.5	1	4		
Vanadium	150	2680	10720	72	Type 4	0.2	10	20	80	0.002	Type 4
Zinc	240	160000	640000	197	Type 4	5	250	500	2000	0.012	Type 4
Inorganic Anions											
Total Dissolved Solids	-	-	-		Not Applicable	1000	12500	25000	100000	136	Type 4
Chloride	-	-	-		Not Applicable	300	15000	30000	120000		
Sulphate	-	-	-		Not Applicable	250	12500	25000	100000	2.7	Type 4
Nitrate	-	-	-		Not Applicable	11	550	1100	4400		
Fluoride	100	10000	40000			1.5	75	150	600		
Cyanide	14	10500	42000			0.07	3.5	7	28		
Organics											
Benzene	-	10	40			-	0.01	0.02	0.08		
Benzo(a)pyrene	-	1.7	6.8			-	0.035	0.07	0.28		
Carbon tetrachloride	-	4	16			-	0.2	0.4	1.6		
Chlorobenzene	-	8800	35200			-	5	10	40		
Chloroform	-	700	2800			-	15	30	120		
2-Chlorophenol	-	2100	8400			-	15	30	120		
Bis(2-ethylhexyl)phthalate	-	40	160			-	0.5	1	4		
1,2-Dichlorobenzene	-	31900	127600			-	5	10	40		
1,4-Dichlorobenzene	-	18400	73600			-	15	30	120		
1,2-Dichloroethane	-	3.7	14.8			-	1.5	3	12		
1,1-Dichloroethene	-	150	600			-	0.35	0.7	2.8		
1,2-Dichloroethene	-	3750	15000			-	2.5	5	20		
Dichloromethane	-	16	64			-	0.25	0.5	2		
2,4-Dichlorophenol	-	800	3200			-	10	20	80		
2,4-Dinitrotoluene	-	5.2	20.8			-	0.065	0.13	0.52		
Ethylbenzene	-	540	2160			-	3.5	7	28		
Formaldehyde	-	2000	8000			-	25	50	200		
Hexachlorobutadiene	-	2.8	5.4			-	0.03	0.06	0.24		
Methyl Ethyl Ketone (2-Butanone)	-	8000	32000			-	100	200	800		
Methyl Tertiary Butyl Ether	-	1435	5740			-	2.5	5	20		
Nitrobenzene	-	45	180			-	1	2	8		
Total PAHs	-	50	200			-	-	-	-	Not Applicable	
>C6-C9	-	650	2600			-	-	-	-	Not Applicable	
>C10-C36	-	10000	40000			-	-	-	-	Not Applicable	
Phenol	-	560	2240			-	7	14	56		
Polychlorinated Biphenyls (PCBs)	-	12	48			-	0.025	0.05	0.2		
Styrene	-	120	480			-	1	2	8		
1,1,1,2-Tetrachloroethane	-	400	1600			-	5	10	40		
1,1,2,2-Tetrachloroethane	-	5	20			-	0.65	1.3	5.3		
Tetrachloroethene	-	200	800			-	0.25	0.5	2		
Toluene	-	1150	4600			-	35	70	280		
Trichlorobenzenes (Sum)	-	3300	13200			-	3.5	7	28		
1,1,1-Trichloroethane	-	1200	4800			-	15	30	120		
1,1,2-Trichloroethane	-	48	192			-	0.06	1	4		
Trichloroethene	-	11600	46400			-	0.25	2	8		
2,4,6-Trichlorophenol	-	1770	7080			-	10	20	80		
Vinyl chloride	-	1.5	6			-	0.015	0.03	0.12		
Xylenes (Sum)	-	890	3560			-	25	50	200		
Pesticides											
Aldrin + Dieldrin	0.05	1.2	4.8			-	0.015	0.03	0.03		
DDT + DDD + DDE	0.05	50	200			-	1	2	2		
2,4-Dichlorophenoxyacetic Acid (2,4-D)	0.05	120	480			-	1.5	3	3		
Chlordane	0.05	4	16			-	0.05	0.1	0.1		
Heptachlor	0.05	1.2	4.8			-	0.015	0.03	0.03		

Supplementary Consideration for Confirmation of Type 4 Waste Type

Organics	Concentration (mg/kg), unless stated: Threshold	Assessed Concentration	Satisfy Type 4
Metals (all concentrations <TCT0 & LCT0):		As above	No
Anions (all concentrations <TCT0 & LCT0):		As above	Yes
Total Organic Carbon	(%) 3		To Clarify
BTEX (Sum)	6		To Clarify
Polychlorinated Biphenyls (PCBs)	1		To Clarify
Mineral Oil (>C10-C40)	500		To Clarify
Pesticides			
Aldrin + Dieldrin	0.05		To Clarify
DDT + DDD + DDE	0.05		To Clarify
2,4-Dichlorophenoxyacetic Acid (2,4-D)	0.05		To Clarify
Chlordane	0.05		To Clarify
Heptachlor	0.05		To Clarify

Notes

1. The final waste type is determined from the most conservative type calculated for any individual substance, whether this be based on Total (TCT) or Leachable (LCT) concentrations.
2. Where a number of waste types are applicable for any given substance (i.e. the consideration of TCTs in isolation cannot result in a Type 4 profile), the final waste type is determined by considering both the TCT and LCT analytical data simultaneously.
3. Only where laboratory analysis has resulted in positive identification of substances (i.e. above laboratory limits of detection) have these been compared to their respective TCTs and LCTs (i.e. substances determined to be at concentrations less than laboratory limits of detection have been assumed to be absent).
4. Notwithstanding disposal prohibitions, profiling of liquid wastes is undertaken by comparing the analytical results obtained directly from the liquid media to the LCT thresholds given that liquid wastes cannot provide a leachate extract for analysis.

Overall Screened Waste Type *(notwithstanding potential disposal prohibitions, see below)*	Category of Landfill *(GN R636 of 2013)*
Type 3 Waste	**Class C / GLB+**

Physicochemical Disposal Prohibitions *(notwithstanding other potential restrictions associated with Waste Type)*

PCBs > 50ppm	PCBs (ppm):			Not assessed or less than laboratory limit of detection
Explosive, corrosive or oxidising according to SANS 10234			No	Not applicable
pH <6 or >12	pH:			Not assessed
Flashpoint <61° Celsius	Flashpoint (°C):			Not assessed
Moisture Content > 40%	Moisture Content (%):			Not assessed or 0%
Hazardous with Calorific Value >10MJ/kg	CV (MJ/kg):		No	Not applicable
Hazardous with Total Organic Carbon >6%	TOC (%):		No	Not applicable
Brine (high salt content) >5% TDS	TDS (%):	N/A	N/A	Not applicable to a solid waste
Leachable TDS >100 000mg/l	TDS (mg/l):	136	No	Not applicable

End of Waste Type Profiling and Disposal Prohibition Appraisal

Appendix C

CLASSIFICATION

Screening Material Classification (SANS 10234:2019; Edition 2)

WSP Reference:	41105637	**Prepared For:**	Seriti Coal (Pty) Ltd
Generator:	New Largo Coal (Pty) Ltd	**Assessment Date:**	May 2023
Source Address:	N4 and N12 highways between Bronkhorstspruit and eMalahleni towns		
Production Process:	Sample 4-Subsoil 2		

General Appearance	Classification Summary
Soil	**Not Hazardous (General)**

Potential Hazard Statement Codes of Relevance

Composition & Quantitative Classification

Composition assessed in general accordance with the following hierarchy:
1. *South African National Standard, Globally Harmonised System of Classification and Labelling of Chemicals (GHS), SANS 10234:2019, Edition 2*
2. *European Regulation (EC) No. 1272/2008, 'Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation)*

Hazard Statement Codes for individual compounds are sourced from:
1. Supplement to SANS 10234:2008 Edition 1
2. Table 3.1 of Annex VI of the CLP Regulations
3. European Chemicals Agency, Classification & Labelling Inventory Database
4. Product (Material) Safety Data Sheet

Where relevant, recorded concentrations have been converted from dry weight values to account for the recorded moisture content of material.

Quantitative screening assessment of individual Hazard Statement Codes presented on the following pages.

Hazard Statement Code	Hazard Statement	Generic Cut-Off Value (%)	Generic Cut-Off Value (ppm)	Generic Cut-Off Value and Test Comments	Assessment Concentration (ppm)	Outcome(s) of Further Testing	Hazardous (Yes / No)	Additional Comments
PHYSICAL HAZARD STATEMENTS								
H200	**Unstable explosive**	0	0	If >0% then classified under H200 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H201	**Explosive; mass explosion hazard**	0	0	If >0% then classified under H201 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H202	**Explosive; severe projection hazard**	0	0	If >0% then classified under H202 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H203	**Explosive; fire, blast or projection hazard**	0	0	If >0% then classified under H203 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H204	**Fire or projection hazard**	0	0	If >0% then classified under H204 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H205	**May mass explode in fire**	0	0	If >0% then classified under H205 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H220	**Extremely flammable gas**	0	0	If >0% then classified under H220 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H221	**Flammable gas**	0	0	If >0% then classified under H221 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H222	**Extremely flammable aerosol**	0	0	If >0% then classified under H222 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H223	**Flammable aerosol**	0	0	If >0% then classified under H223 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H224	**Extremely flammable liquid and vapour**	0	0	If >0% then classified under H224 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H225	**Highly flammable liquid and vapour**	0	0	If >0% then classified under H225 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H226	**Flammable liquid and vapour**	0	0	If >0% then classified under H226 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H227	**Combustible liquid**	0	0	If >0% then classified under H227 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H228	**Flammable solid**	0	0	If >0% then classified under H228 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H229	**Pressurised container: may burst if heated**	0	0	Relevant only for pressurised containers	Not applicable	Not applicable	No	
H230	**May react explosively even in the absence of air**	0	0	If >0% then classified under H230 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H231	**May react explosively even in the absence of air at elevated pressure and/or temperature**	0	0	If >0% then classified under H231 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H240	**Heating may cause an explosion**	0	0	If >0% then classified under H240 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H241	**Heating may cause a fire or explosion**	0	0	If >0% then classified under H241 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H242	**Heating may cause a fire**	0	0	If >0% then classified under H242 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	

Hazard Statement Code	Hazard Statement	Generic Cut-Off Value (%)	Generic Cut-Off Value (ppm)	Generic Cut-Off Value and Test Comments	Assessment Concentration (ppm)	Outcome(s) of Further Testing	Hazardous (Yes / No)	Additional Comments
H250	**Catches fire spontaneously if exposed to air**	0	0	If >0% then classified under H250 unless further information and/or testing proves otherwise	98.50	Potential to catch fire spontaneously if exposed to air: detailed assessment required	Not likely at recorded concentration	
H251	**Self-heating; may catch fire**	0	0	If >0% then classified under H251 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H252	**Self-heating in large quantities; may catch fire**	0	0	If >0% then classified under H252 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H260	**In contact with water releases flammable gases that may ignite spontaneously**	0	0	If >0% then classified under H260 unless further information and/or testing proves otherwise	49.25	Assessment, see below	Substance-specific assessments: see below	
		0.0076	76.1	***Element-specific assessment*** Concentration of aluminium phosphide required to evolve sufficient volume of phosphine in contact with water to potentially render hazardous; based on stoichiometry	No analysis for aluminium	Not applicable	No	
		0.108	1076	***Element-specific assessment*** Concentration of free magnesium required to evolve sufficient volume of hydrogen in contact with water to potentially render hazardous; based on stoichiometry	No analysis for magnesium	Not applicable	No	
		0.346	3463	***Element-specific assessment*** Concentration of free potassium required to evolve sufficient volume of hydrogen in contact with water to potentially render hazardous; based on stoichiometry	No analysis for potassium	Not applicable	No	
		0.204	2036	***Element-specific assessment*** Concentration of free sodium required to evolve sufficient volume of hydrogen in contact with water to potentially render hazardous; based on stoichiometry	No analysis for sodium	Not applicable	No	
H261	**In contact with water releases flammable gas**	0	0	If >0% then classified under H261 unless further information and/or testing proves otherwise	236.00	Assessment, see below	Substance-specific assessments: see below	
		0.608	6082	***Element-specific assessment*** Concentration of free barium required to evolve sufficient volume of hydrogen in contact with water to potentially render hazardous; based on stoichiometry	472.00	Unlikely to generate hazardous volume of hydrogen	No	
		0.177	1775	***Element-specific assessment*** Concentration of free calcium required to evolve sufficient volume of hydrogen in contact with water to potentially render hazardous; based on stoichiometry	No analysis for calcium	Not applicable	No	

Hazard Statement Code	Hazard Statement	Generic Cut-Off Value (%)	Generic Cut-Off Value (ppm)	Generic Cut-Off Value and Test Comments	Assessment Concentration (ppm)	Outcome(s) of Further Testing	Hazardous (Yes / No)	Additional Comments
		0	0	***Compound-specific assessment*** Ferrosilicon may evolve sufficient hydrogen in contact with water to render hazardous; based on ratio of iron:silicon	Ferrosilicon not identified	Not applicable	No	

Hazard Statement Code	Hazard Statement	Generic Cut-Off Value (%)	Generic Cut-Off Value (ppm)	Generic Cut-Off Value and Test Comments	Assessment Concentration (ppm)	Outcome(s) of Further Testing	Hazardous (Yes / No)	Additional Comments
H270	**May cause or intensify fire; oxidiser**	0	0	If >0% then classified under H270 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H271	**May cause fire or explosion; strong oxidiser**	0	0	If >0% then classified under H271 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H272	**May intensify fire; oxidiser**	0	0	If >0% then classified under H272 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H280	**Contains gas under pressure; may explode if heated**	0	0	If >0% then classified under H280 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H281	**Contains refrigerated gas; may cause cryogenic burns or injury**	0	0	If >0% then classified under H281 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
H290	**May be corrosive to metals**	0	0	If contributing substance >0% then conservatively classified under H290 unless further information and/or testing proves otherwise	No substances identified	Not applicable	No	
HEALTH HAZARD STATEMENTS								
H300	**Fatal if swallowed**	1	10000	If cumulative/additive concentrations of contributing substances >1% then conservatively classified under H300 (Category 1 Acute Toxicity: Oral); pending further assessment	No substances identified	Not applicable	No	
H301	**Toxic if swallowed**	1	10000	If individual substance concentration >1% then conservatively classified under H301 (Category 3 Acute Toxicity: Oral); pending further assessment	8.80	Further assessment not necessary	No	
H302	**Harmful if swallowed**	1	10000	If individual substance concentration >1% then conservatively classified under H302 (Category 4 Acute Toxicity: Oral); pending further assessment	1.08	Further assessment not necessary	No	
H303	**May be harmful if swallowed**	1	10000	If individual substance concentration >1% then conservatively classified under H303 (Category 5 Acute Toxicity: Oral); pending further assessment	No substances identified	Not applicable	No	
H304	**May be fatal if swallowed and enters airways**	10	100000	If cumulative/additive concentrations of contributing substances ≥10% then conservatively classified under H304 (Aspiration Hazard, Category 1); pending further assessment	No substances identified	Not applicable	No	
H305	**May be harmful if swallowed and enters airways**	10	100000	If cumulative/additive concentrations of contributing substances ≥10% classified under H305 (Aspiration Hazard, Category 2); pending further assessment	No substances identified	Not applicable	No	
H310	**Fatal in contact with skin**	1	10000	If cumulative/additive >1% classified under H310 (Category 1 Acute Toxicity); pending further assessment	No substances identified	Not applicable	No	
H311	**Toxic in contact with skin**	1	10000	If individual substance >1% classified under H311 (Category 3 Acute Toxicity); pending further assessment	No substances identified	Not applicable	No	

Hazard Statement Code	Hazard Statement	Generic Cut-Off Value (%)	Generic Cut-Off Value (ppm)	Generic Cut-Off Value and Test Comments	Assessment Concentration (ppm)	Outcome(s) of Further Testing	Hazardous (Yes / No)	Additional Comments
H312	**Harmful in contact with skin**	1	10000	If individual substance >1% classified under H312 (Category 4 Acute Toxicity); pending further assessment	No substances identified	Not applicable	No	
H313	**May be harmful in contact with skin**	1	10000	If individual substance >1% classified under H313 (Category 5 Acute Toxicity); pending further assessment	No substances identified	Not applicable	No	
H314	**Causes severe skin burns and eye damage**	1	10000	If cumulative/additive >1% classified under H314 (Category 1 Skin Corrosion/Irritant); pending further assessment	No substances identified	Not applicable	No	
		≤2 pH Units ≥11.5		***pH-specific assessment*** If ≤2 or ≥11.5 pH then classified as corrosive	pH not determined	Not applicable	Unclarified	
H315	**Causes skin irritation**	1	10000	If cumulative/additive >1% classified under H315 (Category 3 Skin Corrosion/Irritant), >10% then Category 2; pending further assessment	472.00	Further assessment not necessary	No	
H316	**Causes mild skin irritation**	10	100000	If cumulative/additive >10% classified under H316 (Category 3 Skin Corrosion/Irritant); pending further assessment	No substances identified	Not applicable	No	
H317	**May cause an allergic skin reaction**	0.1	1000	If individual substance ≥0.1% classified under H317 (Category 1 Skin Sensitisation); pending further assessment	43.00	Further assessment not necessary	No	
H318	**Causes serious eye damage**	1	10000	If cumulative/additive >1% classified under H318 (Category 2 Skin/Eye Sensitisation); pending further assessment	No substances identified	Not applicable	No	
H319	**Causes serious eye irritation**	10	100000	If cumulative/additive >10% classified under H319 (Category 2 Eye Sensitisation); pending further assessment	472.00	Further assessment not necessary	No	
H320	**Causes eye irritation**	10	100000	If cumulative/additive >10% classified under H320 (Category 2 Eye Sensitisation); pending further assessment	No substances identified	Not applicable	No	
H330	**Fatal if inhaled**	1	10000	If cumulative/additive >1% classified under H330 (Category 1 Acute Toxicity); pending further assessment	No substances identified	Not applicable	No	
H331	**Toxic if inhaled**	1	10000	If individual substance >1% classified under H331 (Category 3 Acute Toxicity); pending further assessment	8.80	Further assessment not necessary	No	
H332	**Harmful if inhaled**	1	10000	If individual substance >1% classified under H332 (Category 4 Acute Toxicity); pending further assessment	No substances identified	Not applicable	No	
H333	**May be harmful if inhaled**	1	10000	If individual substance >1% classified under H333 (Category 5 Acute Toxicity); pending further assessment	No substances identified	Not applicable	No	
H334	**May cause allergy or asthma symptoms or breathing difficulties if inhaled**	0.1	1000	If individual substance >0.1% classified under H334 (Category 1 Respiratory Sensitisation); pending further assessment	24.40	Further assessment not necessary	No	
H335	**May cause respiratory irritation**	20	200000	If cumulative/additive >20% classified under H335 under Generic Limits; pending further assessment	472.00	Further assessment not necessary	No	

Hazard Statement Code	Hazard Statement	Generic Cut-Off Value (%)	Generic Cut-Off Value (ppm)	Generic Cut-Off Value and Test Comments	Assessment Concentration (ppm)	Outcome(s) of Further Testing	Hazardous (Yes / No)	Additional Comments
H336	**May cause drowsiness or dizziness**	20	200000	If cumulative/additive >20% classified under H336 under Generic Limits; pending further assessment	No substances identified	Not applicable	No	
H340	**May cause genetic defects**	0.1	1000	If individual substance >0.1% classified under H340 (Category 1 Mutagen); pending further assessment	No substances identified	Not applicable	No	
H341	**Suspected of causing genetic defects**	1	10000	If individual substance >1% classified under H341 (Category 2 Mutagen); pending further assessment	No substances identified	Not applicable	No	
H350	**May cause cancer**	0.1	1000	If individual substance >0.1% classified under H350 (Category 1 Carcinogen); pending further assessment	No substances identified	Not applicable	No	
H351	**Suspected of causing cancer**	0.1	1000	If individual substance >0.1% classified under H351 (Category 2 Carcinogen); pending further assessment	43.00	Further assessment not necessary	No	
H360	**May damage fertility or the unborn child**	0.1	1000	If individual substance >0.1% classified under H360 (Category 1 Teratogen); pending further assessment	No substances identified	Not applicable	No	
H361	**Suspected of damaging fertility or the unborn child**	0.1	1000	If individual substance >0.1% classified under H361 (Category 2 Teratogen); pending further assessment	No substances identified	Not applicable	No	
H361d	**Suspected of damaging the unborn child**	0.1	1000	If individual substance >0.1% classified under H361d; pending further assessment	No substances identified	Not applicable	No	
H362	**May cause harm to breast-fed children**	0.1	1000	If individual substance >0.1% classified under H362 (Additional Category Teratogen); pending further assessment	No substances identified	Not applicable	No	
H370	**Causes damage to organs**	1	10000	If individual substance >1% classified under H370 (Category 1 Single Exposure); pending further assessment	No substances identified	Not applicable	No	
H371	**May cause damage to organs**	1	10000	If individual substance >1% classified under H371 (Category 2 Single Exposure); pending further assessment	No substances identified	Not applicable	No	
H372	**Causes damage to organs through prolonged or repeated exposure**	1	10000	If individual substance >1% classified under H372 (Category 1 Repeat Exposure); pending further assessment	43.00	Further assessment not necessary	No	
H373	**May cause damage to organs through prolonged or repeated exposure**	1	10000	If individual substance >1% classified under H373 (Category 2 Repeat Exposure); pending further assessment	No substances identified	Not applicable	No	
		0.005	50	***PCB-specific assessment*** If PCBs are present >0.005% then classified hazardous under H373	No analysis for PCBs	Not applicable	Unclarified: not anticipated	
ENVIRONMENTAL HAZARD STATEMENTS								
H400	**Very toxic to aquatic life**	1	10000	If cumulative/additive >1% classified under H400 (Category 1 Acute Aquatic Toxicity); pending further assessment	205.80	Further assessment not necessary	No	
H401	**Toxic to aquatic life**	25	250000	If modified cumulative/additive >25% classified under H401 (Category 2 Acute Aquatic Toxicity); pending further assessment	2058.00	Further assessment not necessary	No	

Hazard Statement Code	Hazard Statement	Generic Cut-Off Value (%)	Generic Cut-Off Value (ppm)	Generic Cut-Off Value and Test Comments	Assessment Concentration (ppm)	Outcome(s) of Further Testing	Hazardous (Yes / No)	Additional Comments
H402	**Harmful to aquatic life**	25	250000	If modified cumulative/additive >25% classified under H402 (Category 3 Acute Aquatic Toxicity); pending further assessment	20580.00	Further assessment not necessary	No	
H410	**Very toxic to aquatic life with long lasting effects**	1	10000	If cumulative/additive >1% classified under H410 (Category 1 Chronic Aquatic Toxicity); pending further assessment	205.80	Further assessment not necessary	No	
H411	**Toxic to aquatic life with long lasting effects**	25	250000	If modified cumulative/additive >25% classified under H411 (Category 2 Chronic Aquatic Toxicity); pending further assessment	2058.00	Further assessment not necessary	No	
H412	**Harmful to aquatic life with long lasting effects**	25	250000	If modified cumulative/additive >25% classified under H412 (Category 3 Chronic Aquatic Toxicity); pending further assessment	20625.00	Further assessment not necessary	No	
H413	**May cause long lasting harmful effects to aquatic life**	25	250000	If modified cumulative/additive >25% classified under H413 (Category 4 Chronic Aquatic Toxicity); pending further assessment	275.20	Further assessment not necessary	No	
H420	**Harms public health and the environment by destroying ozone in the upper atmosphere**	0.1	1000	If individual substance >0.1% classified under H420 (Category 1). Substances based on Annexes to the Montreal Protocol.	No substances identified	Not applicable	No	

Assumptions and Comments

1. Acute Toxicity Estimates (ATE) have not been derived from LD50 data or conversion factors presented in SANS 10234; screening classification has been based on generic cut-off values. Where more detailed assessment is recommended, appropriate LD50 should be sourced based on current available data.

2. Ecotoxicity for Category 1 Acute and Chronic Hazards have assumed 1% threshold and additive compounds rather than utilisation of Weighting Factor/s presented in SANS 10234. Where more detailed assessment is recommended, this should follow the mixture-specific principles defined in SANS 10234.

3. Classification does not include European Union (EU), or other territory-specific, Hazard Statement Codes that may be applicable outside of the Republic of South Africa.

4. Only where data is presented, or where laboratory analysis has resulted in positive identification of substances (i.e. above laboratory limits of detection), have the applicable Hazard Statement Codes been appraised (i.e. substances determined to be at concentrations less than laboratory limits of detection have been assumed to be absent).

5. Unless exact speciation has been established through detailed analysis, classification has been based on reasonable assumptions of substances most-likely present based on expected behaviour within the material. It is recognised that this may not be applicable in all instances and, for clarity, a list of the individual substances appraised where assumptions have been made are listed below.

6. Where laboratory analysis has reported concentrations on a dry weight basis these have been converted to take account of sample moisture content using the formula:
Wet Weight Concentration = Dry Weight Concentration x ((100 - %moisture content)/100).

7. Where assessment has been undertaken on liquids, it has been assumed that 1-litre (volume) is equivalent to 1-kg (mass).

8. For additional details in respect of the individual substances that may render any given material type as hazardous, reference should be made to the appropriate Safety Data Sheet (SDS) which takes account of this classification or, if an SDS has not been prepared, the appropriate report relevant for this classification.

9. To the best of our knowledge, the information contained herein is accurate; however, WSP assumes no liability whatsoever for its accuracy or completeness. The classification of any material, and its appropriate management, remains the responsibility of the generator. All materials may present unknown hazards. Although certain hazards are described herein, it cannot be guaranteed that these are the only hazards that exist, or that these have been recognised in full.

List of Assumed Substances, where necessary

Antimony, Arsenic, Barium, Boron, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Vanadium, Zinc,

END