APPENDICES

APPENDIX 3C-1

Distribution of As, Cu and Zn by depth for WDD boreholes

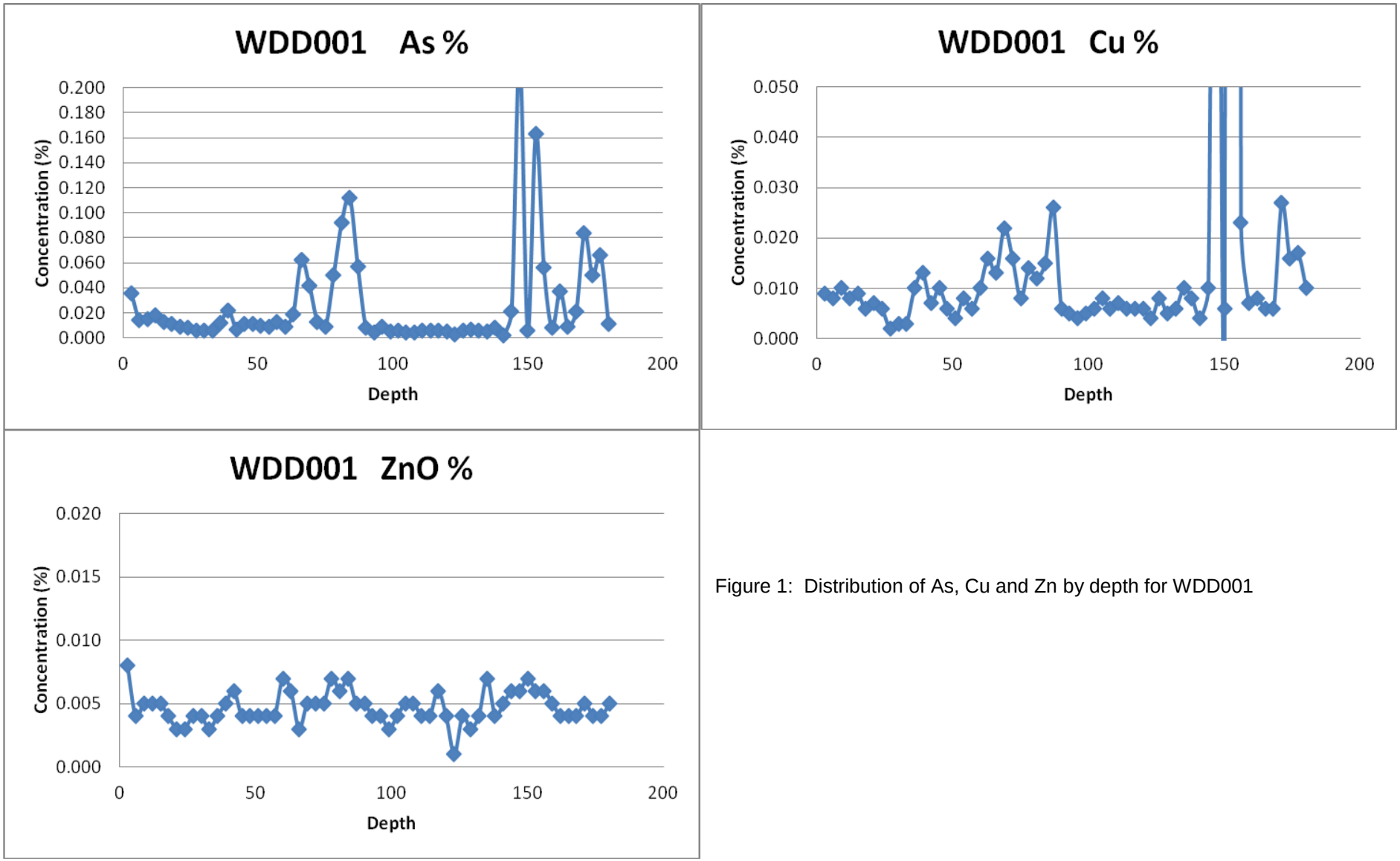


Figure 1: Distribution of As, Cu and Zn by depth for WDD001

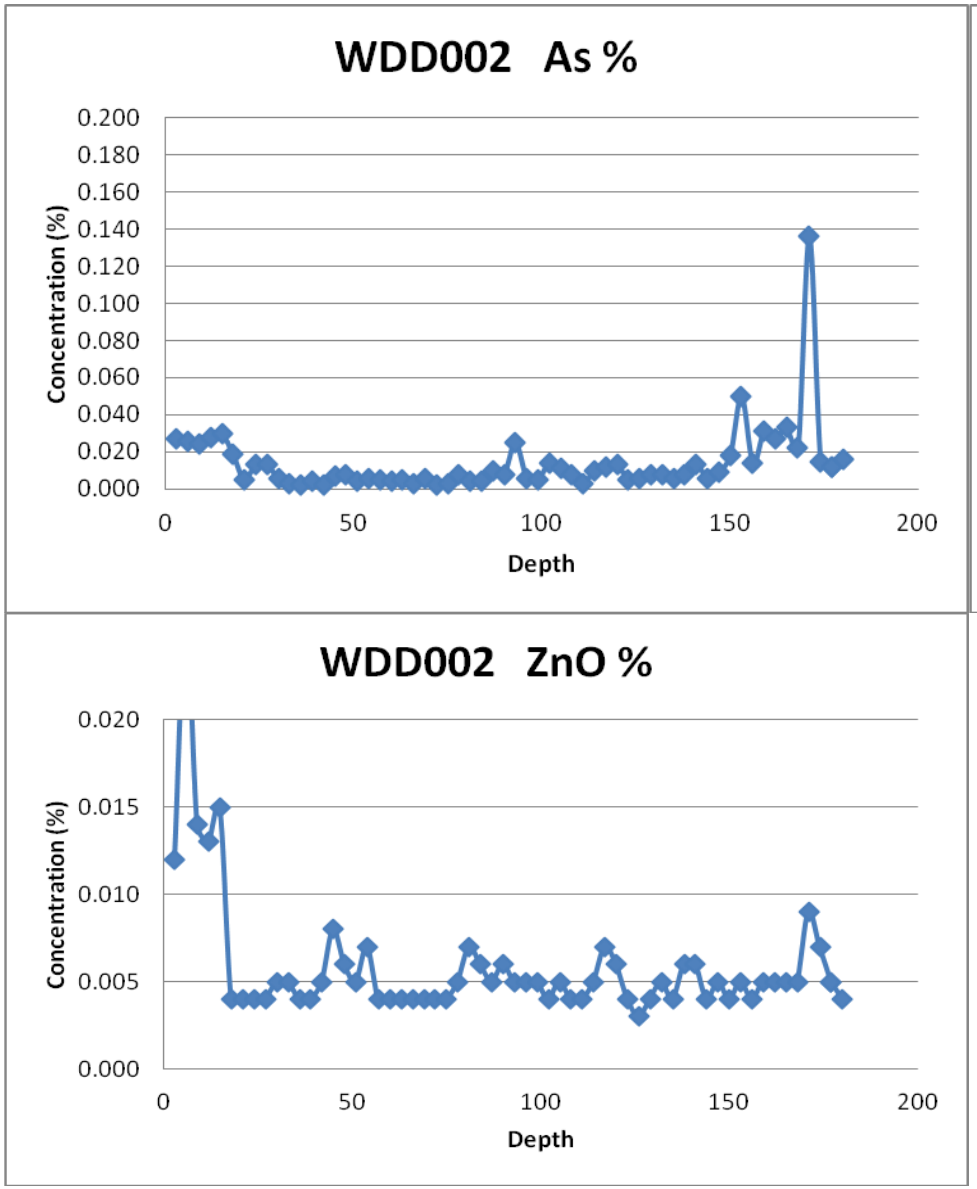


Figure 2: Distribution of As, Cu and Zn by depth for WDD002

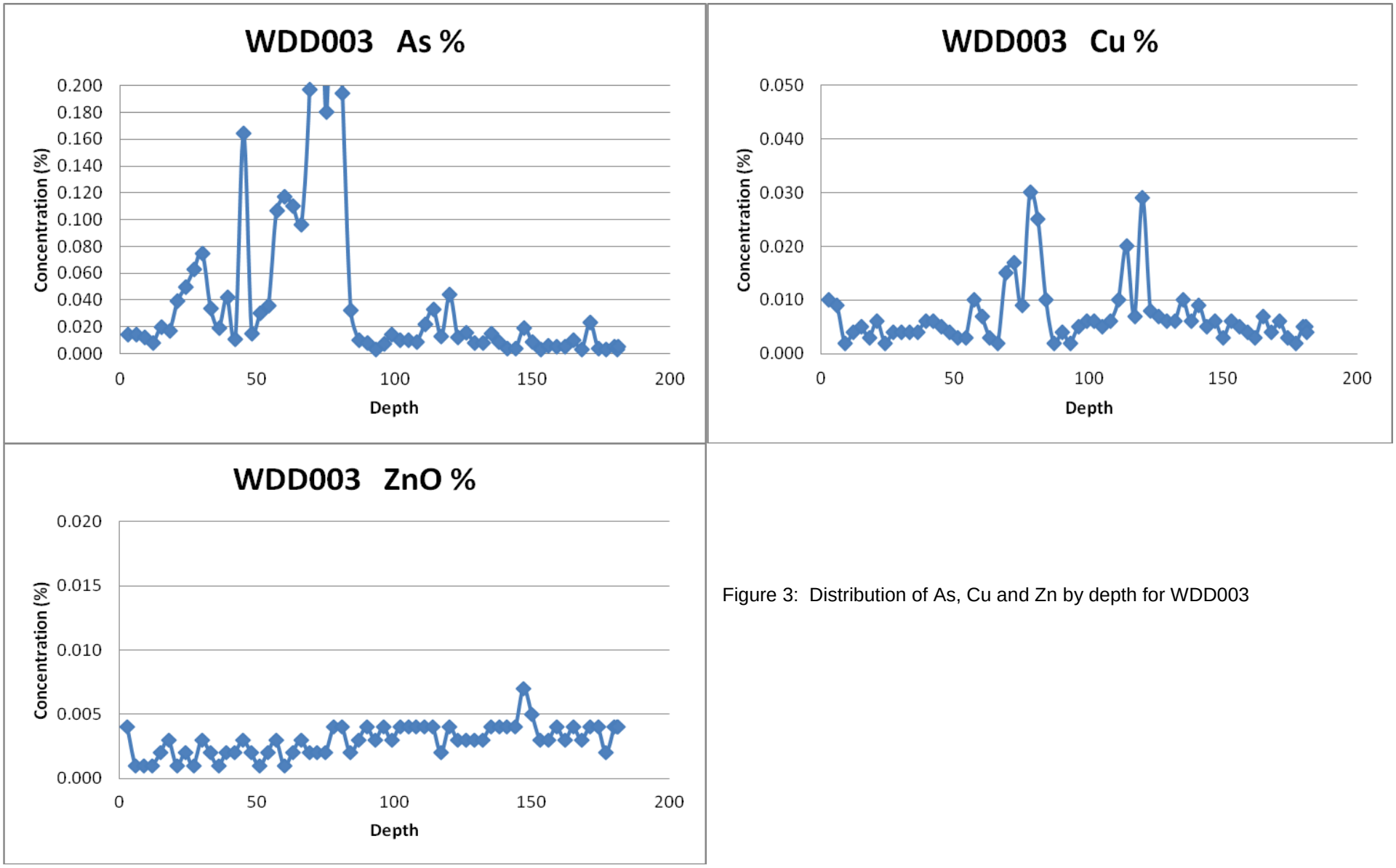


Figure 3: Distribution of As, Cu and Zn by depth for WDD003

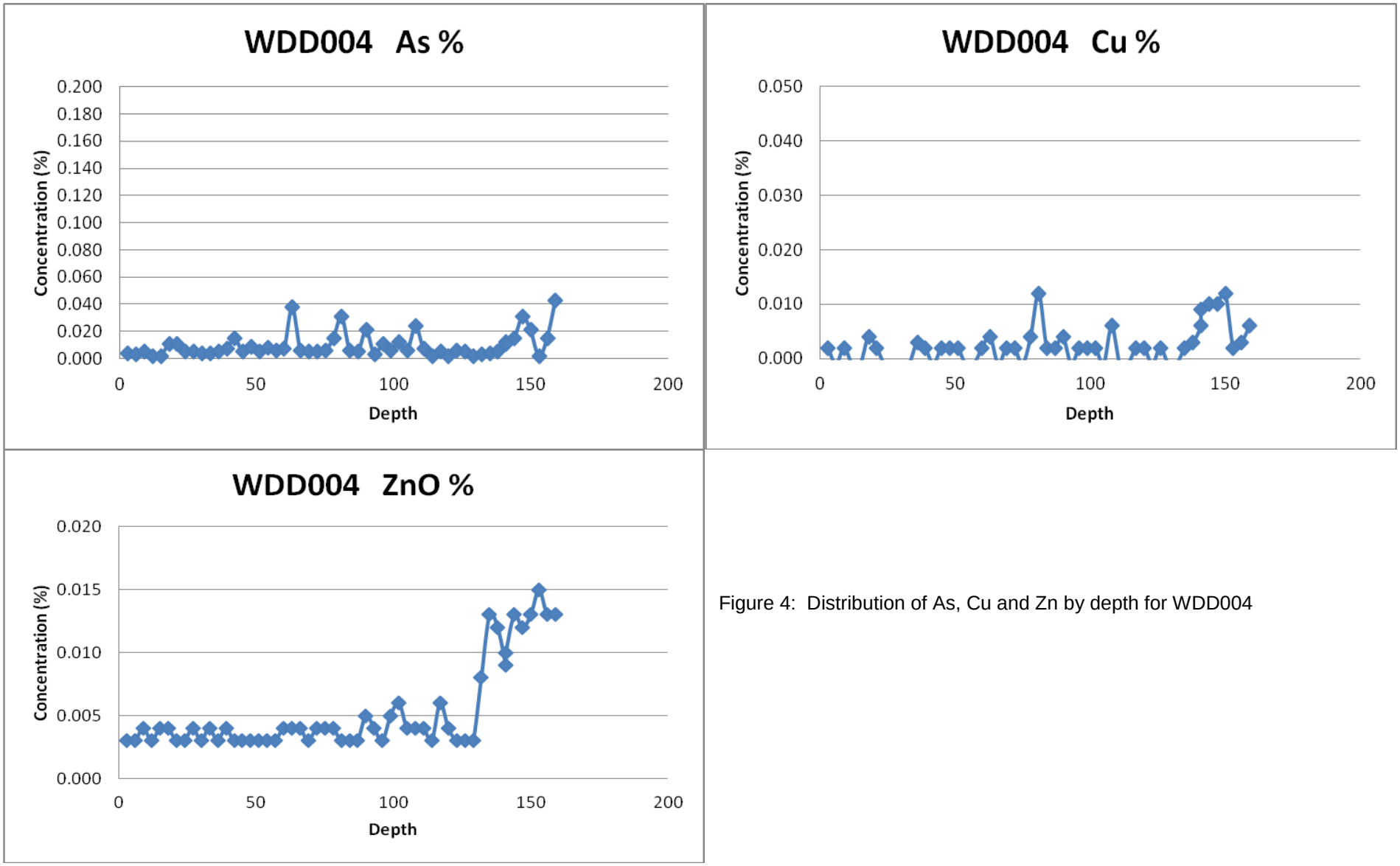


Figure 4: Distribution of As, Cu and Zn by depth for WDD004

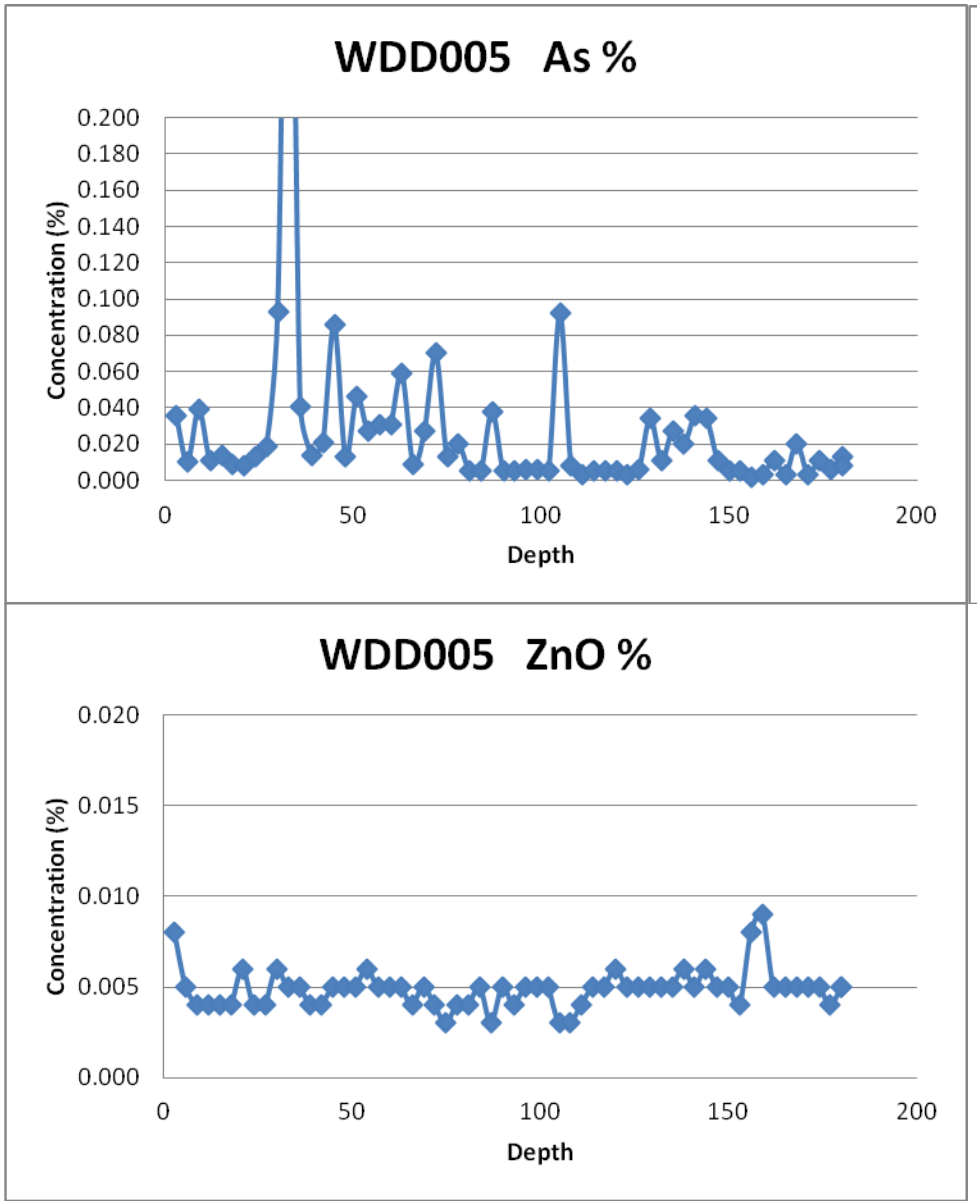
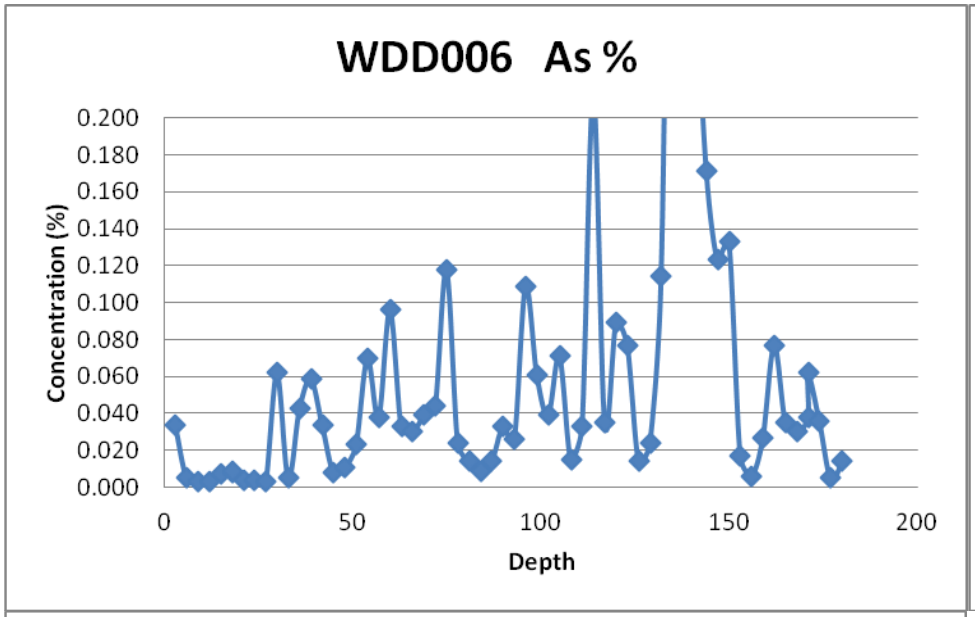
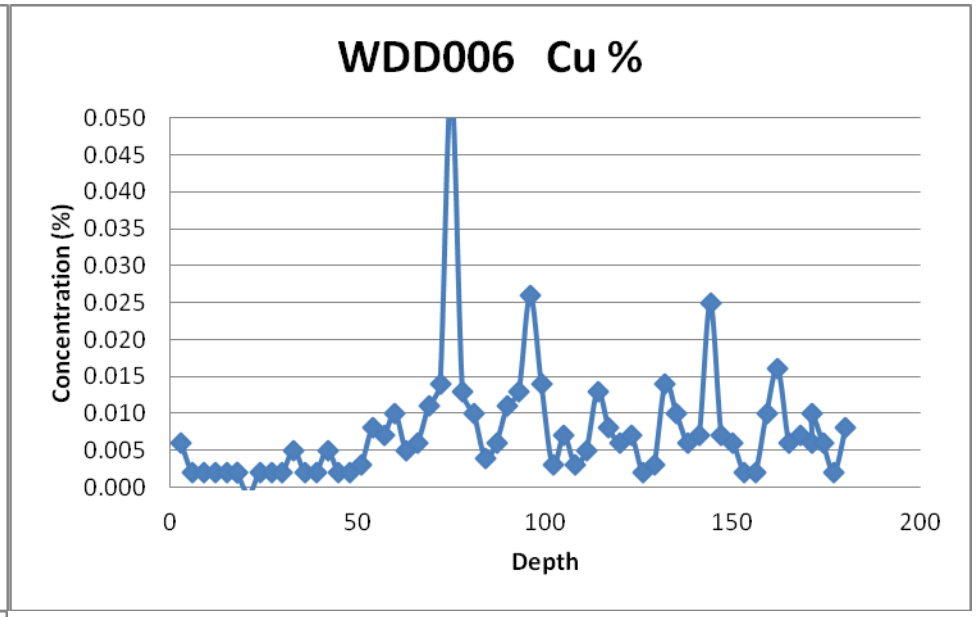


Figure 5: Distribution of As, Cu and Zn by depth for WDD005





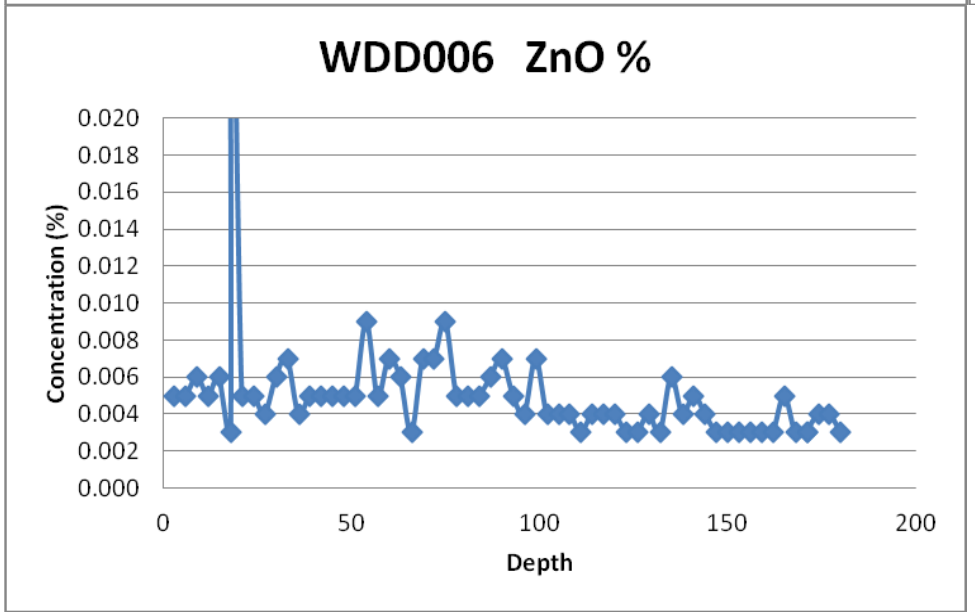


Figure 6: Distribution of As, Cu and Zn by depth for WDD006

APPENDIX 3C-2

IMO Everything Metallurgy

Hemerdon Project Arsenic Deportment Report

Wolf Minerals Limited

Hemerdon Project

Arsenic Deportment Report

Project 5180
October 2012

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1 EXECUTIVE SUMMARY

Assays were conducted on 3 metre intervals across 6 drill holes along the Hemerdon resource. From this, arsenic and sulphur assays have allowed some analysis to the extent of variance within the arsenic mineralisation of the Hemerdon Deposit.

Scorodite ($AsFeO3.2H_2O$) mineralisation can have a serious impact upon the processing of the ore in the Hemerdon flowsheet.

Due to only 13 % of the samples tested being above the detection limit of sulphur assaying (0.01%) , thus corresponding to a 30 % samples arsenic arsenic grades qualifying for the analysis. Thus a degree of extrapolation and assumption has been required.

Analysis shows that there is more Scorodite in the soft granite region than the hard and it appears to be more dominant at the soft/hard granite interface. However there is still some degree of randomness and a significant proportion of Scorodite can be seen at depth in the hard granite. Arsenopyrite ($AsFeS_2$), in general, appears to be far more dominant than Scorodite.

There is potential for grade control of the ore in regards to Scorodite as it appears as lenses in the deposit.

It appears that Scorodite prevalence increases in the region associated with WDD006. WDD006 has a ratio of Scorodite/Arsenopyrite approaching 1:1 and Scorodite is present down the entire hole.

In the region approaching WDD001, the arsenopyrite becomes more prevalent, and scorodite diminishes to being contained within finite “lenses”.

2 INTRODUCTION

The Hemerdon Project has identified during the pilot plant a significant proportion of Scorodite ($AsFeO_3.2H_2O$) in the feed ore. This has serious implications upon the performance of the flowsheet and in achieving the required market specification of arsenic within the tungsten concentrate. It had previously been assumed that Arsenopyrite ($AsFeS_2$) is the major arsenic bearing mineral present in the deposit with only minor amounts of other arsenic mineralisation.

The implication of elevated levels of Scorodite is that it cannot be removed from the flotation circuit. The Scorodite can only be removed from the concentrate via the roaster; however, if the grade entering the roaster is too high this may lead to an elevated grade reporting to magnetic separation. Scorodite entering the product separation magnetic circuit cannot be separated as there is no selectivity via magnetism. As such, it has the potential to contaminate the refined concentrate.

Six holes were drilled to a depth of 180m. These drill core samples were assayed at 3 m intervals for a suite of elements, including arsenic and sulphur. This enabled some analysis to determine the extent of Arsenopyrite and Scorodite in the ore. This analysis is explained in the following document.

3 ORE CLASSIFICATION

3.1 Defined Regions

Drill holes WDD001 to WDD006, which can be seen on the figure in Appendix A from the Hemerdon DFS document, were analysed. From these holes, three specific areas have been identified: the clay topsoil, the soft granite deposit and the hard granite deposit. Table 1 outlines the ore zones, which have also been defined in terms of depth.

Table 1 - Ore Zone Depth

	Soft (m)	Hard (m)
WDD001	0-72	72-180
WDD002	0-77	77-180
WDD003	0-77	77-181
WDD004	0-42	42-159
WDD005	0-66	66-180
WDD006	0-78	78-180

3.2 Basis of analysis

Assays were performed, indicating the sulphur and arsenic grades. No sulphide differentiation was done on the samples and thus it is assumed that all the contained sulphur is present as sulphides. This was verified via LECO versus total sulphur analysis.

It is expected that the predominant sulphide mineral in the ore is Arsenopyrite. From the molecular formula of Arsenopyrite ($AsFeS_2$) there is an As/S ratio of 2.34:1 with respect to mass. It is assumed that all the sulphur in the assays is associated with Arsenopyrite, thus the sulphur assay is used to determine the proportion of Arsenopyrite in the sample. The remaining arsenic is assumed to be associated with Scorodite.

Of the samples assayed, 87% had the sulphur grade below the detection limit (0.01%). The proportion of samples below the detection limit is seen in Table 2.

Table 2 – Samples Below Sulphur Detection Limit

	Total Samples	Samples above detection limit	Percentage of samples below detection limit
WDD001	65	17	73.85%
WDD002	67	8	88.06%
WDD003	69	10	85.51%
WDD004	58	0	100.00%
WDD005	67	1	98.51%
WDD006	67	15	77.61%

The large proportion of assays below the detection limit mean there is a high possibility that Arsenopyrite is being overstated.

Utilising a sulphur detection limit of 0.01%, the minimum corresponding arsenic grade possible for determining Arsenopyrite is 0.0234% As. Only 30% of the samples had an As grade of 0.0234% or higher. This further compounds the possibility of Arsenopyrite being overstated without being able to differentiate between it and Scorodite. Without a more sensitive assay, 70% of the samples are assumed to have only Arsenopyrite, as Scorodite cannot be accounted for.

4 ANALYSIS

4.1 Variations Across Each Drill Hole

Graphs of the calculated ratios for each drill hole are displayed below.

Figure 1 - Scorodite/Arsenopyrite Ratios for Drill Hole WDD001

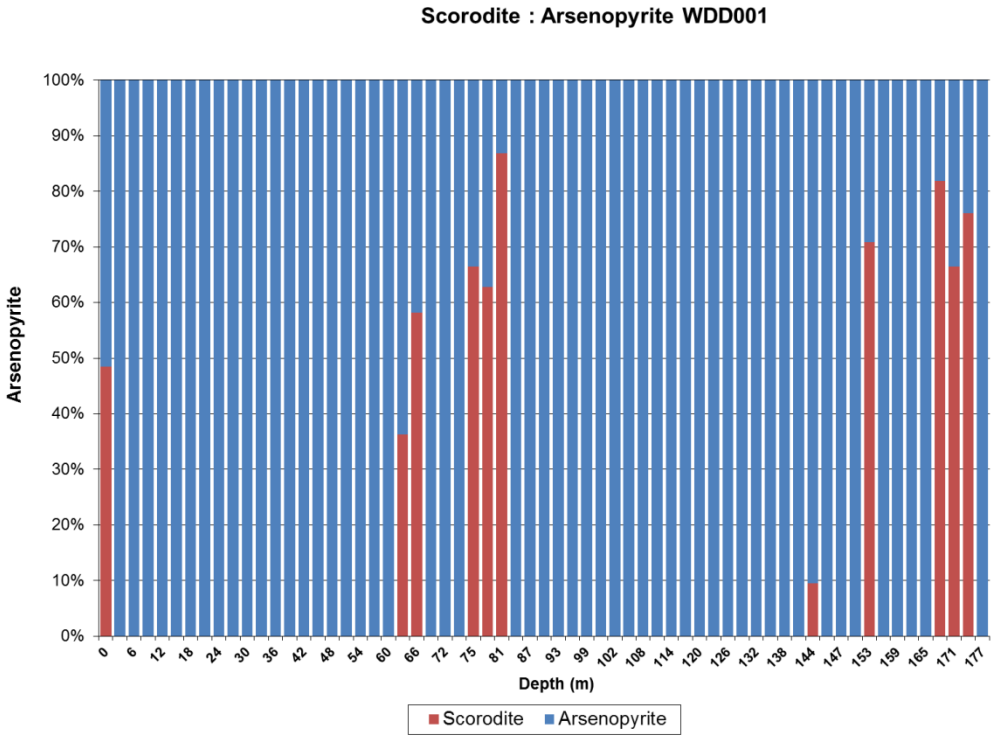


Figure 2 - Scorodite/Arsenopyrite Ratios for Drill Hole WDD002

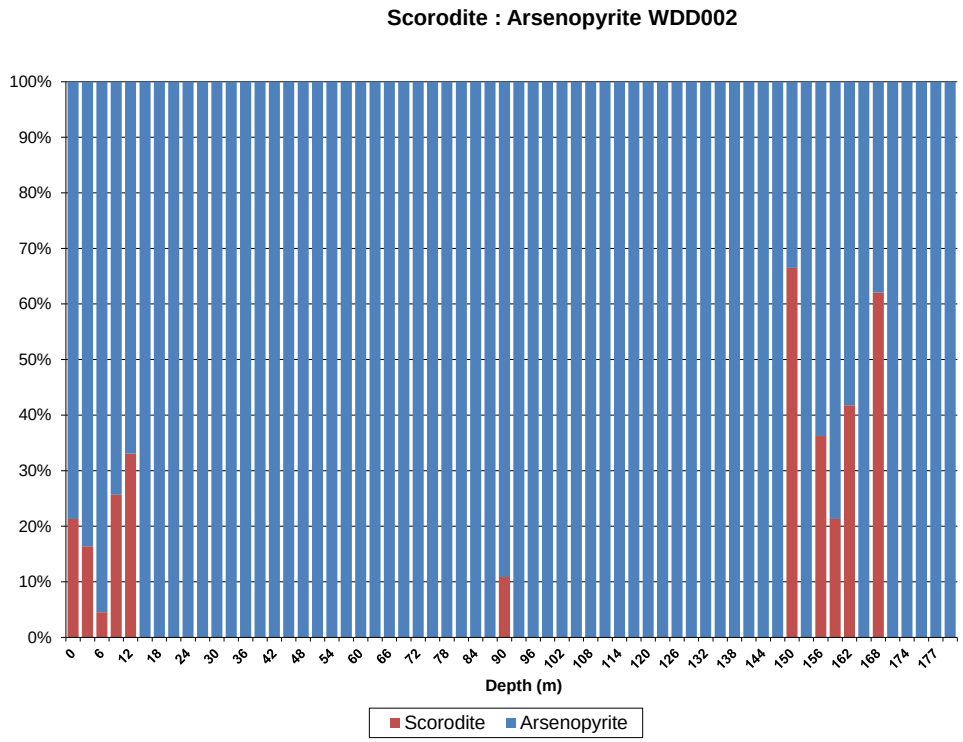


Figure 3 - Scorodite/Arsenopyrite Ratios for Drill Hole WDD003

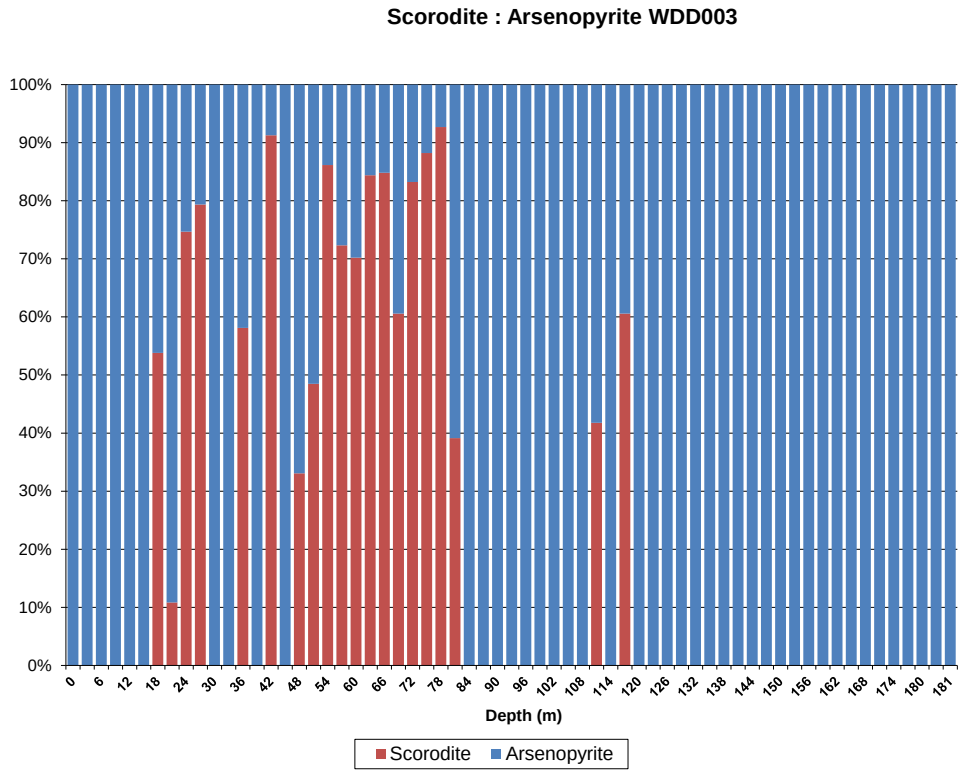


Figure 4 - Scorodite/Arsenopyrite Ratios for Drill Hole WDD004

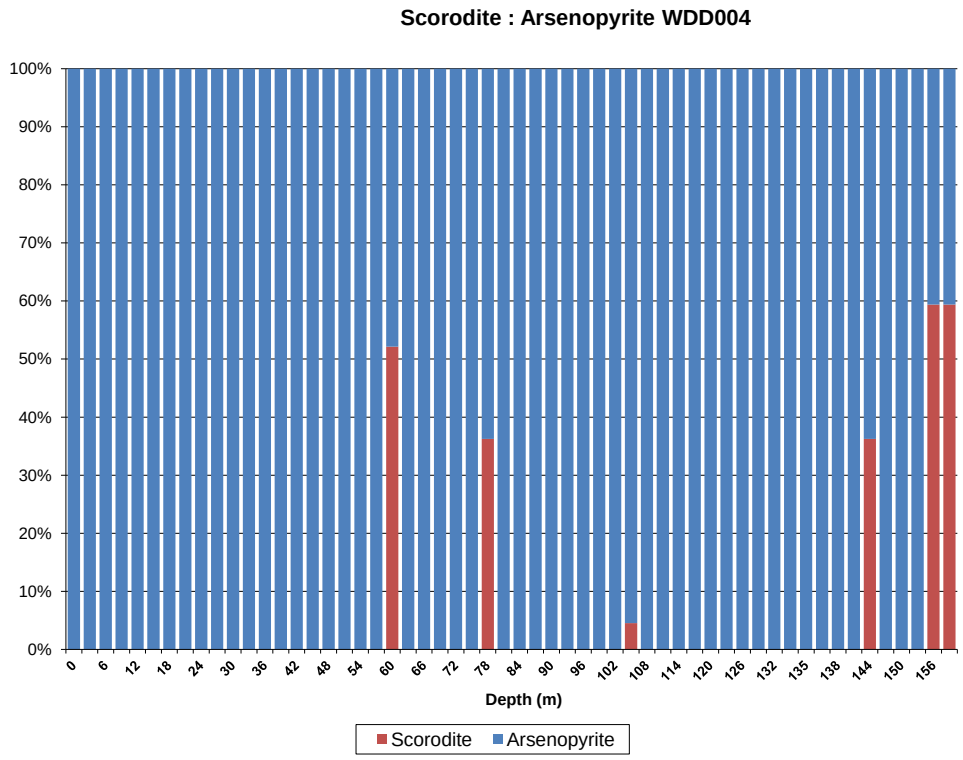


Figure 5 - Scorodite/Arsenopyrite Ratios for Drill Hole WDD005

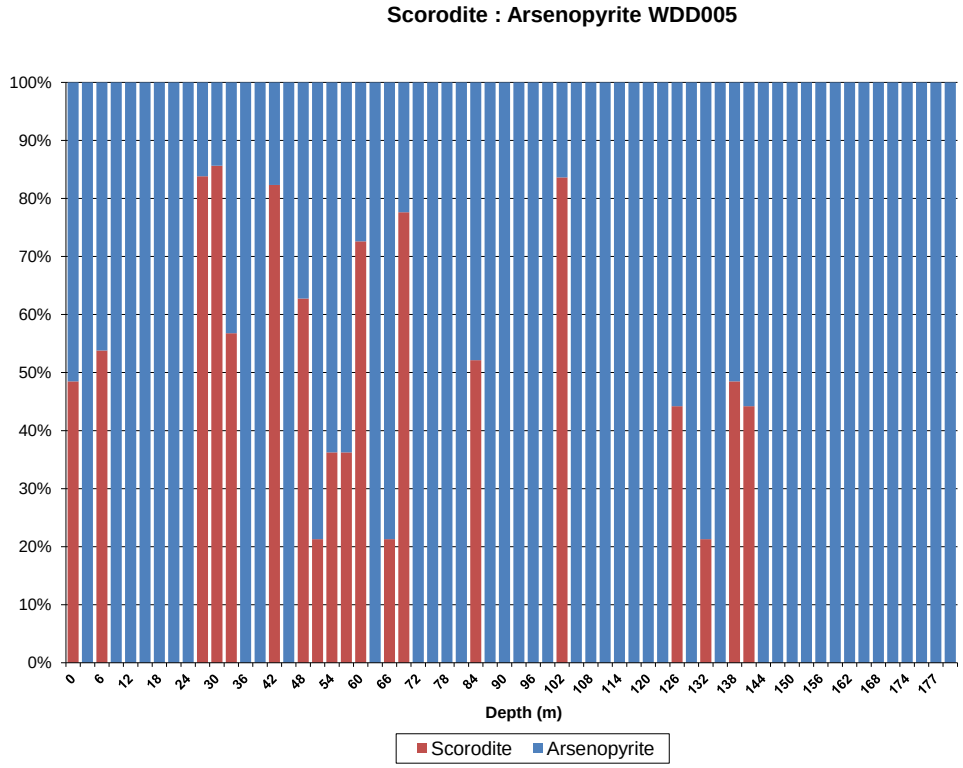
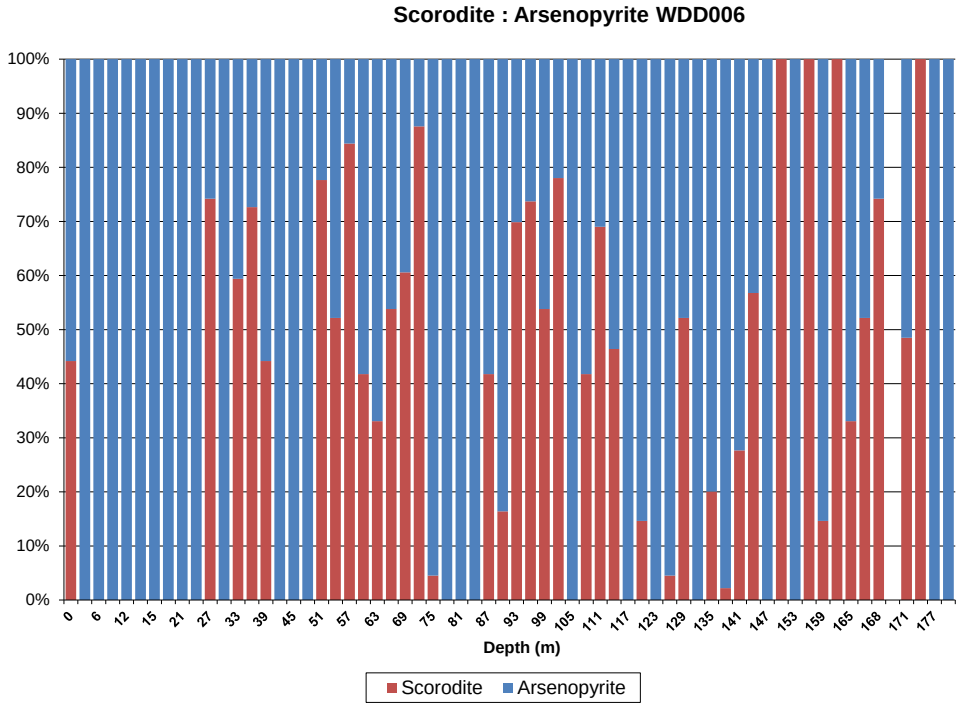


Figure 6 - Scorodite/Arsenopyrite Ratios for Drill Hole WDD006



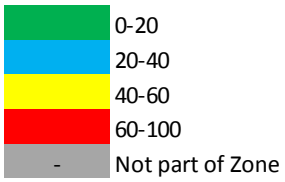
As shown, there is a significant variance with the amount of Scorodite present. There tends to be a higher proportion of Scorodite in the soft-granite (as mentioned in the depth logs in Appendix B), however there is no definitive relationship. It can be seen in WDD006 that Scorodite is prevalent across the entire drill hole depth profile.

4.2 Variation with Respect to Region

A graphical representation of the drill holes across the deposit is given in Appendix A.

Table 3 – Proportion of Scorodite Across Drill Holes in the "Soft-Granite" Region

Soft Granite		Proportion of Arsenic in Feed as Scorodite					
Start(m)	End (m)	WDD006	WDD005	WDD004	WDD003	WDD002	WDD001
0	3	44.2	48.5	0.0	0.0	21.3	48.5
3	6	0.0	0.0	0.0	0.0	16.4	0.0
6	9	0.0	53.8	0.0	0.0	4.5	0.0
9	12	0.0	0.0	0.0	0.0	25.7	0.0
12	15	0.0	0.0	0.0	0.0	33.1	0.0
15	18	0.0	0.0	0.0	0.0	0.0	0.0
18	21	0.0	0.0	0.0	53.8	0.0	0.0
21	24	0.0	0.0	0.0	10.9	0.0	0.0
24	27	0.0	0.0	0.0	74.7	0.0	0.0
27	30	74.2	83.8	0.0	79.4	0.0	0.0
30	33	0.0	85.6	0.0	0.0	0.0	0.0
33	36	59.4	56.8	0.0	0.0	0.0	0.0
36	39	72.6	0.0	0.0	58.1	0.0	0.0
39	42	44.2	0.0	0.0	0.0	0.0	0.0
42	45	0.0	82.3	-	91.3	0.0	0.0
45	48	0.0	0.0	-	0.0	0.0	0.0
48	51	0.0	62.8	-	33.1	0.0	0.0
51	54	77.6	21.3	-	48.5	0.0	0.0
54	57	52.2	36.2	-	86.2	0.0	0.0
57	60	84.4	36.2	-	72.3	0.0	0.0
60	63	41.8	72.6	-	70.2	0.0	0.0
63	66	33.1	0.0	-	84.4	0.0	36.2
66	69	53.8	-	-	84.8	0.0	58.1
69	72	60.6	-	-	60.6	0.0	0.0
72	75	87.6	-	-	83.2	0.0	-
75	78	4.5	-	-	88.2	0.0	-



There appears to be a greater proportion of Scorodite at greater depth in the soft granite in what would appear to be the "interface" between the soft and hard granite. To some degree, it may be possible to have periods of low and high occurrences when mining the material.

Table 4 - Proportion of Scorodite Across Drill Holes in the “Hard-Granite” Region

Hard Granite		Proportion of Arsenic in Feed as Scorodite					
Start(m)	End (m)	WDD006	WDD005	WDD004	WDD003	WDD002	WDD001
42	45	-	-	0.0	-	-	-
45	48	-	-	0.0	-	-	-
48	51	-	-	0.0	-	-	-
51	54	-	-	0.0	-	-	-
54	57	-	-	0.0	-	-	-
57	60	-	-	0.0	-	-	-
60	63	-	-	52.2	-	-	-
63	66	-	-	0.0	-	-	-
66	69	-	21.3	0.0	-	-	-
69	72	-	77.6	0.0	-	-	-
72	75	-	0.0	0.0	-	-	0.0
75	78	-	0.0	0.0	-	-	66.5
78	81	0.0	0.0	36.2	92.7	0.0	62.8
81	84	0.0	0.0	0.0	39.1	0.0	86.8
84	87	0.0	52.2	0.0	0.0	0.0	0.0
87	90	41.8	0.0	0.0	0.0	0.0	0.0
90	93	16.4	0.0	0.0	0.0	10.9	0.0
93	96	69.9	0.0	0.0	0.0	0.0	0.0
96	99	73.7	0.0	0.0	0.0	0.0	0.0
99	102	53.8	0.0	0.0	0.0	0.0	0.0
102	105	78.0	83.6	0.0	0.0	0.0	0.0
105	108	0.0	0.0	4.5	0.0	0.0	0.0
108	111	41.8	0.0	0.0	0.0	0.0	0.0
111	114	69.0	0.0	0.0	41.8	0.0	0.0
114	117	46.4	0.0	0.0	0.0	0.0	0.0
117	120	0.0	0.0	0.0	60.6	0.0	0.0
120	123	14.6	0.0	0.0	0.0	0.0	0.0
123	126	0.0	0.0	0.0	0.0	0.0	0.0
126	129	4.5	44.2	0.0	0.0	0.0	0.0
129	132	52.2	0.0	0.0	0.0	0.0	0.0
132	135	0.0	21.3	0.0	0.0	0.0	0.0
135	138	20.1	0.0	0.0	0.0	0.0	0.0
141	141	2.2	0.0	0.0	0.0	0.0	0.0
144	144	27.7	0.0	0.0	0.0	0.0	0.0
147	147	56.8	36.2	0.0	0.0	0.0	0.0
150	150	0.0	0.0	0.0	0.0	9.5	9.5
153	153	100.0	0.0	0.0	66.5	0.0	0.0
156	156	0.0	0.0	0.0	0.0	0.0	0.0
159	159	100.0	59.4	0.0	36.2	0.0	0.0
159	162	14.6	0.0	-	0.0	21.3	70.8
162	165	100.0	0.0	-	0.0	41.8	0.0
165	168	33.1	0.0	-	0.0	0.0	0.0
168	171	74.2	0.0	-	0.0	62.1	0.0
171	174	48.5	0.0	-	0.0	0.0	0.0
174	177	100.0	0.0	-	0.0	0.0	81.9
177	180	0.0	0.0	-	0.0	0.0	66.5

0-20
20-40
40-60
60-100
- Not part of Zone

In the hard granite there appears to be less occurrence of Scorodite, however it is still present. In particular, WDD006 appears have relatively consistent occurrance down the entire depth of the drill hole.

5 CONCLUSION

It appears that Scorodite occurrences are higher within the “soft-granite” region. There does not appear to be a significant relationship; however the Scorodite that is present would appear to be in “lenses”, whereby the regions of elevated Scorodite appear at distinct depth markers.

The occurrences of Scorodite tend to increase when approaching the region corresponding to WDD006, while approaching the region associated with WDD001, tends to have a greater proportion of Arsenopyrite.

There is a lack of confidence due to detection limits which makes the analysis difficult; however a number of conclusions can be drawn. Although there is some potential in selectively processing material (as it appears to be in “lenses”), there is no definitive relationship. This means that a certain degree of vigilance is required to reduce the risk of contaminating the final concentrate due to high arsenic. Care will need to be taken in knowing when surges of Scorodite material are coming through with regards to the duty of the flotation circuit, roaster and subsequent off-gas scrubbing. This can be overcome with stockpiling and appropriate blending and analysis.

The inclusion of the pre-concentrate blending and storage system into the flowsheet will allow for advance warning of an increasing Scorodite ratio feeding the refinery, via sampling.

There is no way of gauging the proportion of “Hematised Wolframite” which is the primary driver for the roaster in the flowsheet.

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Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
1	R Kochmanski	S Kerenyi		S Hoban		08/10/12

APPENDIX A

Drill Hole Diagram from Hemerdon DFS

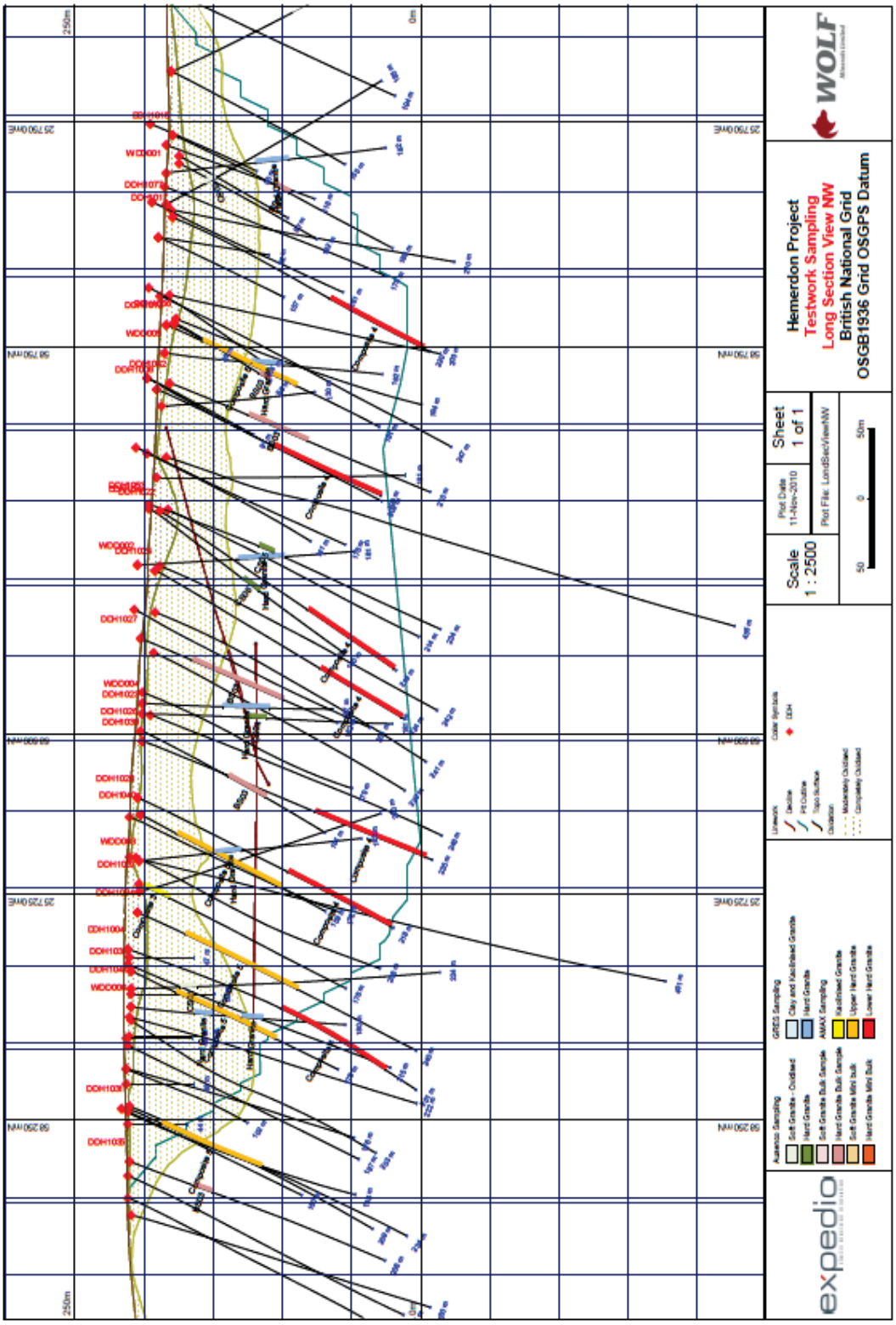

Figure 5-3: Sample source locations for test-work programs

APPENDIX B

Assay Data & Calculated Ratios

DRILL HOLE ID	SAMPLE ID	Depth From	Depth To	As	Calc S_IDE	Calc As	As	Arsenopyrite	As	Scorodite	Ratio	Ratio	Ratio
				%	%	Arsenopyrite	Arsenopyrite	%	Scorodite	%	Scorodite	Arsenopyrite	
WDD001	WDD0241	0	3	########	########	0.023	0.023	0.083	0.013	0.078	48.48	51.52	-0.76
WDD001	WDD0242	3	6	########	########	0.023	0.014	0.050	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0243	6	9	########	########	0.023	0.015	0.053	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0244	9	12	########	########	0.023	0.018	0.064	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0245	12	15	########	########	0.023	0.013	0.046	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0246	15	18	########	########	0.023	0.011	0.039	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0247	18	21	########	########	0.023	0.009	0.032	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0248	21	24	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0249	24	27	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0250	27	30	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0251	30	33	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0252	33	36	########	########	0.023	0.012	0.042	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0253	36	39	########	########	0.023	0.022	0.078	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0254	39	42	########	########	0.023	0.007	0.025	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0255	42	45	########	########	0.023	0.011	0.039	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0256	45	48	########	########	0.023	0.011	0.039	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0257	48	51	########	########	0.023	0.010	0.035	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0258	51	54	########	########	0.023	0.009	0.032	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0259	54	57	########	########	0.023	0.013	0.046	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0260	57	60	########	########	0.047	0.009	0.032	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0261	60	63	########	########	0.047	0.019	0.067	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0262	63	66	########	########	0.047	0.047	0.165	0.015	0.094	36.25	63.75	-6.88
WDD001	WDD0263	66	69	########	########	0.023	0.023	0.083	0.019	0.115	58.12	41.88	4.06
WDD001	WDD0264	69	72	########	########	0.023	0.013	0.046	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0265	72	75	########	########	0.023	0.009	0.032	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0265	72	75	########	0.02	0.047	0.009	0.032	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0266	75	78	########	0.0	0.023	0.023	0.083	0.027	0.164	66.48	33.52	8.24
WDD001	WDD0267	78	81	########	0.02	0.047	0.047	0.165	0.045	0.279	62.77	37.23	6.38
WDD001	WDD0268	81	84	########	0.01	0.023	0.023	0.083	0.089	0.546	86.84	13.16	18.42
WDD001	WDD0269	84	87	########	0.03	0.070	0.057	0.202	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0270	87	90	########	0.01	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0271	90	93	########	0.0	0.023	0.004	0.014	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0272	93	96	########	0.0	0.023	0.009	0.032	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0273	96	99	########	0.0	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0274	99	102	########	0.0	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0274	99	102	########	0.01	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0275	102	105	########	0.02	0.047	0.004	0.014	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0276	105	108	########	0.02	0.047	0.004	0.014	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0277	108	111	########	0.0	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0278	111	114	########	0.01	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0279	114	117	########	0.0	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0280	117	120	########	0.01	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0281	120	123	########	0.0	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0282	123	126	########	0.0	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0283	126	129	########	0.0	0.023	0.007	0.025	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0284	129	132	########	0.01	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0285	132	135	########	0.02	0.047	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0286	135	138	########	0.0	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0287	138	141	########	0.0	0.023	0.002	0.007	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0288	141	144	########	0.02	0.047	0.021	0.074	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0289	144	147	########	0.09	0.210	0.210	0.744	0.013	0.078	9.52	90.48	-20.24
WDD001	WDD0289	144	147	########	0.10	0.234	0.224	0.793	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0290	147	150	########	0.02	0.047	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0291	150	153	########	0.48	1.122	0.163	0.577	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0292	153	156	########	0.0	0.023	0.023	0.083	0.033	0.201	70.85	29.15	10.42
WDD001	WDD0293	156	159	########	0.0	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0294	159	162	########	0.02	0.047	0.037	0.131	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0295	162	165	########	0.0	0.023	0.009	0.032	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0296	165	168	########	0.0	0.023	0.021	0.074	<0.01	<0.01	0.00	100.00	-100.00
WDD001	WDD0297	168	171	########	0.01	0.023	0.023	0.083	0.061	0.373	81.87	18.13	15.93
WDD001	WDD0298	171	174	########	0.01	0.023	0.023	0.083	0.027	0.164	66.48	33.52	8.24
WDD001	WDD0299	174	177	########	0.0	0.023	0.023	0.083	0.043	0.263	76.05	23.95	13.02
WDD001	WDD0300	177	180	########	0.0	0.023	0.011	0.039	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0301	0	3	########	########	0.023	0.023	0.083	0.004	0.022	21.30	78.70	-14.35
WDD002	WDD0302	3	6	########	########	0.023	0.023	0.083	0.003	0.016	16.40	83.60	-16.80
WDD002	WDD0303	6	9	########	########	0.023	0.023	0.083	0.001	0.004	4.51	95.49	-22.74
WDD002	WDD0304	9	12	########	########	0.023	0.023	0.083	0.005	0.029	25.66	74.34	-12.17
WDD002	WDD0305	12	15	########	########	0.023	0.023	0.083	0.007	0.041	33.07	66.93	-8.47
WDD002	WDD0306	15	18	########	########	0.023	0.019	0.067	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0307	18	21	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0308	21	24	########	########	0.023	0.013	0.046	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0309	24	27	########	########	0.023	0.013	0.046	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0310	27	30	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0311	30	33	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0312	33	36	########	########	0.023	0.002	0.007	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0313	36	39	########	########	0.023	0.004	0.014	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0314	39	42	########	########	0.023	0.002	0.007	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0315	42	45	########	########	0.023	0.007	0.025	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0316	45	48	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0317	48	51	########	########	0.023	0.004	0.014	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0318	51	54	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0319	54	57	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0320	57	60	########	########	0.023	0.004	0.014	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0321	60	63	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0322	63	66	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0323	66	69	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0324	69	72	########	########	0.023	0.002	0.007	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0325	72	75	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0326	75	78	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0327	78	81	########	########	0.023	0.004	0.014	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0328	81	84	########	########	0.023	0.004	0.014	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0329	84	87	########	########	0.023	0.010	0.035	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0330	87	90	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0331	90	93	########	########	0.023	0.023	0.083	0.002	0.010	10.85	89.15	-19.57
WDD002	WDD0332	93	96	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0333	96	99	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0334	99	102	########	########	0.023	0.014	0.050	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0335	102	105	########	########	0.023	0.011	0.039	<0.01	<0.01	0.00	100.00	-100.00

DRILL HOLE ID	SAMPLE ID	Depth From	Depth To	As	Calc S_IDE	Calc As	As	Arsenopyrite	As	Scorodite	Ratio	Ratio	Ratio
				%	%	Arsenopyrite	Arsenopyrite	%	Scorodite	%	Scorodite	Arsenopyrite	
WDD002	WDD0336	105	108	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0337	108	111	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0338	111	114	########	########	0.023	0.010	0.035	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0339	114	117	########	########	0.023	0.012	0.042	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0340	117	120	########	########	0.023	0.013	0.046	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0341	120	123	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0342	123	126	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0343	126	129	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0344	129	132	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0345	132	135	########	########	0.047	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0346	135	138	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0347	138	141	########	########	0.023	0.013	0.046	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0348	141	144	########	########	0.047	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0349	144	147	########	########	0.023	0.009	0.032	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0350	147	150	########	########	0.023	0.018	0.064	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0351	150	153	########	########	0.023	0.023	0.083	0.027	0.164	66.48	33.52	8.24
WDD002	WDD0352	153	156	########	########	0.047	0.014	0.050	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0353	156	159	########	########	0.023	0.023	0.083	0.008	0.047	36.25	63.75	-6.88
WDD002	WDD0354	159	162	########	########	0.023	0.023	0.083	0.004	0.022	21.30	78.70	-14.35
WDD002	WDD0355	162	165	########	########	0.023	0.023	0.083	0.010	0.059	41.78	58.22	-4.11
WDD002	WDD0356	165	168	########	########	0.023	0.022	0.078	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0357	168	171	########	########	0.070	0.070	0.248	0.066	0.406	62.06	37.94	6.03
WDD002	WDD0358	171	174	########	########	0.023	0.015	0.053	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0359	174	177	########	0.01	0.023	0.012	0.042	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0359	174	177	########	0.01	0.023	0.012	0.042	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0360	177	180	########	0.01	0.023	0.016	0.057	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0360	177	180	########	0.0	0.023	0.017	0.060	<0.01	<0.01	0.00	100.00	-100.00
WDD002	WDD0360	177	180										
WDD003	WDD0061	0	3	########	########	0.023	0.014	0.050	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0062	3	6	########	########	0.023	0.014	0.050	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0063	6	9	########	########	0.023	0.012	0.042	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0064	9	12	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0065	12	15	########	########	0.023	0.020	0.071	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0066	15	18	########	########	0.023	0.017	0.060	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0067	18	21	########	########	0.023	0.023	0.083	0.016	0.096	53.80	46.20	1.90
WDD003	WDD0068	21	24	########	########	0.047	0.047	0.165	0.003	0.020	10.85	89.15	-19.57
WDD003	WDD0069	24	27	########	########	0.023	0.023	0.083	0.040	0.244	74.69	25.31	12.35
WDD003	WDD0070	27	30	########	########	0.023	0.023	0.083	0.052	0.318	79.36	20.64	14.68
WDD003	WDD0071	30	33	########	########	0.047	0.034	0.120	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0072	33	36	########	########	0.023	0.019	0.067	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0073	36	39	########	########	0.023	0.023	0.083	0.019	0.115	58.12	41.88	4.06
WDD003	WDD0074	39	42	########	########	0.023	0.011	0.039	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0075	42	45	########	########	0.023	0.023	0.083	0.141	0.866	91.28	8.72	20.64
WDD003	WDD0076	45	48	########	########	0.023	0.015	0.053	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0077	48	51	########	########	0.023	0.023	0.083	0.007	0.041	33.07	66.93	-8.47
WDD003	WDD0078	51	54	########	########	0.023	0.023	0.083	0.013	0.078	48.48	51.52	-0.76
WDD003	WDD0079	54	57	########	########	0.023	0.023	0.083	0.084	0.515	86.17	13.83	18.08
WDD003	WDD0080	57	60	########	########	0.047	0.047	0.165	0.070	0.433	72.35	27.65	11.17
WDD003	WDD0081	60	63	########	########	0.047	0.047	0.165	0.063	0.390	70.20	29.80	10.10
WDD003	WDD0082	63	66	########	########	0.023	0.023	0.083	0.073	0.447	84.40	15.60	17.20
WDD003	WDD0083	66	69	########	########	0.047	0.047	0.165	0.150	0.925	84.84	15.16	17.42
WDD003	WDD0084	69	72	########	########	0.234	0.234	0.827	0.206	1.271	60.58	39.42	5.29
WDD003	WDD0085	72	75	########	########	0.047	0.047	0.165	0.133	0.821	83.23	16.77	16.61
WDD003	WDD0086	75	78	########	########	0.070	0.070	0.248	0.302	1.859	88.23	11.77	19.11
WDD003	WDD0087	78	81	########	########	0.023	0.023	0.083	0.171	1.051	92.70	7.30	21.35
WDD003	WDD0088	81	84	########	########	0.023	0.023	0.083	0.009	0.053	39.14	60.86	-5.43
WDD003	WDD0089	84	87	########	########	0.023	0.010	0.035	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0090	87	90	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0091	90	93	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0092	93	96	########	########	0.023	0.007	0.025	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0093	96	99	########	########	0.023	0.014	0.050	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0094	99	102	########	########	0.023	0.010	0.035	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0095	102	105	########	########	0.023	0.010	0.035	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0096	105	108	########	########	0.023	0.009	0.032	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0097	108	111	########	########	0.023	0.022	0.078	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0098	111	114	########	########	0.023	0.023	0.083	0.010	0.059	41.78	58.22	-4.11
WDD003	WDD0099	114	117	########	########	0.023	0.013	0.046	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0100	117	120	########	########	0.023	0.023	0.083	0.021	0.127	60.58	39.42	5.29
WDD003	WDD0101	120	123	########	########	0.023	0.012	0.042	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0102	123	126	########	########	0.023	0.016	0.057	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0103	126	129	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0104	129	132	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0105	132	135	########	########	0.023	0.015	0.053	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0106	135	138	########	########	0.023	0.009	0.032	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0107	138	141	########	########	0.023	0.004	0.014	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0108	141	144	########	########	0.023	0.004	0.014	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0109	144	147	########	########	0.023	0.019	0.067	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0110	147	150	########	########	0.023	0.009	0.032	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0111	150	153	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0112	153	156	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0113	156	159	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0114	159	162	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0115	162	165	########	########	0.023	0.010	0.035	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0116	165	168	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0117	168	171	########	########	0.023	0.023	0.081	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0118	171	174	########	########	0.023	0.004	0.014	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0119	174	177	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0120	177	180	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0120A	180	181	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0120B	181	181.31	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD003	WDD0120B	181	81.31	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0121	0	3	########	########	0.023	0.004	0.014	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0122	3	6	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0123	6	9	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0124	9	12	########	########	0.023	0.002	0.007	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0125	12	15	########	########	0.023	0.002	0.007	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0126	15	18	########	########	0.023	0.011	0.039	<0.01	<0.01	0.00	100.00	-100.00

DRILL HOLE ID	SAMPLE ID	Depth From	Depth To	As	Calc S_IDE	Calc As	As	Arsenopyrite	As	Scorodite	Ratio	Ratio	Ratio
				%	%	Arsenopyrite	Arsenopyrite	%	Scorodite	%	Scorodite	Arsenopyrite	
WDD004	WDD0127	18	21	########	########	0.023	0.011	0.039	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0128	21	24	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0129	24	27	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0130	27	30	########	########	0.023	0.004	0.014	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0131	30	33	########	########	0.023	0.004	0.014	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0132	33	36	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0133	36	39	########	########	0.023	0.007	0.025	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0134	39	42	########	########	0.023	0.015	0.053	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0135	42	45	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0136	45	48	########	########	0.023	0.009	0.032	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0137	48	51	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0138	51	54	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0139	54	57	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0140	57	60	########	########	0.023	0.007	0.025	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0141	60	63	########	########	0.023	0.023	0.083	0.015	0.090	52.15	47.85	1.08
WDD004	WDD0142	63	66	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0143	66	69	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0144	69	72	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0145	72	75	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0146	75	78	########	########	0.023	0.015	0.053	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0147	78	81	########	########	0.023	0.023	0.083	0.008	0.047	36.25	63.75	-6.88
WDD004	WDD0148	81	84	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0149	84	87	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0150	87	90	########	########	0.023	0.021	0.074	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0151	90	93	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0152	93	96	########	########	0.023	0.011	0.039	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0153	96	99	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0154	99	102	########	########	0.023	0.012	0.042	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0155	102	105	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0156	105	108	########	########	0.023	0.023	0.083	0.001	0.004	4.51	95.49	-22.74
WDD004	WDD0157	108	111	########	########	0.023	0.007	0.025	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0158	111	114	########	########	0.023	0.002	0.007	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0159	114	117	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0160	117	120	########	########	0.023	0.002	0.007	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0161	120	123	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0162	123	126	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0163	126	129	########	########	0.023	0.002	0.007	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0164	129	132	########	0.0	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0165	132	135	########	0.0	0.023	0.004	0.014	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0165	132	135	########	0.01	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0166	135	138	########	0.0	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0167	138	141	########	0.0	0.023	0.012	0.042	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0167	138	141	########	0.0	0.023	0.011	0.039	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0168	141	144	########	0.0	0.023	0.015	0.053	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0169	144	147	########	0.0	0.023	0.023	0.083	0.008	0.047	36.25	63.75	-6.88
WDD004	WDD0170	147	150	########	0.0	0.023	0.021	0.074	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0171	150	153	########	0.0	0.023	0.002	0.007	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0172	153	156	########	0.0	0.023	0.015	0.053	<0.01	<0.01	0.00	100.00	-100.00
WDD004	WDD0173	156	159	########	0.0	0.023	0.023	0.083	0.020	0.121	59.39	40.61	4.69
WDD004	WDD0173	156	159	########	0.01	0.023	0.023	0.083	0.020	0.121	59.39	40.61	4.69
WDD005	WDD0181	0	3	########	########	0.023	0.023	0.083	0.013	0.078	48.48	51.52	-0.76
WDD005	WDD0182	3	6	########	########	0.023	0.010	0.035	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0183	6	9	########	########	0.023	0.023	0.083	0.016	0.096	53.80	46.20	1.90
WDD005	WDD0184	9	12	########	########	0.023	0.011	0.039	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0185	12	15	########	########	0.023	0.014	0.050	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0186	15	18	########	########	0.023	0.009	0.032	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0187	18	21	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0188	21	24	########	########	0.023	0.013	0.046	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0189	24	27	########	########	0.023	0.019	0.067	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0190	27	30	########	########	0.023	0.023	0.083	0.070	0.429	83.83	16.17	16.92
WDD005	WDD0191	30	33	########	########	0.093	0.093	0.331	0.321	1.974	85.65	14.35	17.82
WDD005	WDD0192	33	36	########	########	0.023	0.023	0.083	0.018	0.109	56.77	43.23	3.39
WDD005	WDD0193	36	39	########	########	0.023	0.014	0.050	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0194	39	42	########	########	0.023	0.021	0.074	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0195	42	45	########	########	0.023	0.023	0.083	0.063	0.386	82.35	17.65	16.17
WDD005	WDD0196	45	48	########	########	0.023	0.013	0.046	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0197	48	51	########	########	0.023	0.023	0.083	0.023	0.139	62.77	37.23	6.38
WDD005	WDD0198	51	54	########	########	0.023	0.023	0.083	0.004	0.022	21.30	78.70	-14.35
WDD005	WDD0199	54	57	########	########	0.023	0.023	0.083	0.008	0.047	36.25	63.75	-6.88
WDD005	WDD0200	57	60	########	########	0.023	0.023	0.083	0.008	0.047	36.25	63.75	-6.88
WDD005	WDD0201	60	63	########	########	0.023	0.023	0.083	0.036	0.219	72.63	27.37	11.32
WDD005	WDD0202	63	66	########	########	0.023	0.009	0.032	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0203	66	69	########	########	0.023	0.023	0.083	0.004	0.022	21.30	78.70	-14.35
WDD005	WDD0204	69	72	########	########	0.023	0.023	0.083	0.047	0.287	77.64	22.36	13.82
WDD005	WDD0205	72	75	########	########	0.023	0.013	0.046	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0206	75	78	########	########	0.023	0.020	0.071	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0207	78	81	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0208	81	84	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0209	84	87	########	########	0.023	0.023	0.083	0.015	0.090	52.15	47.85	1.08
WDD005	WDD0210	87	90	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0211	90	93	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0212	93	96	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0213	96	99	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0214	99	102	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0215	102	105	########	########	0.023	0.023	0.083	0.069	0.423	83.64	16.36	16.82
WDD005	WDD0216	105	108	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0217	108	111	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0218	111	114	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0219	114	117	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0220	117	120	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0221	120	123	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0222	123	126	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0223	126	129	########	########	0.023	0.023	0.083	0.011	0.065	44.20	55.80	-2.90
WDD005	WDD0224	129	132	########	########	0.023	0.011	0.039	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0225	132	135	########	########	0.023	0.023	0.083	0.004	0.022	21.30	78.70	-14.35
WDD005	WDD0226	135	138	########	########	0.023	0.020	0.071	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0227	138	141	########	########	0.023	0.023	0.083	0.013	0.078	48.48	51.52	-0.76

DRILL HOLE ID	SAMPLE ID	Depth From	Depth To	As	Calc S_IDE	Calc As	As	Arsenopyrite	As	Scorodite	Ratio	Ratio	Ratio
				%	%	Arsenopyrite	Arsenopyrite	%	Scorodite	%	Scorodite	Arsenopyrite	
WDD005	WDD0228	141	144	########	########	0.023	0.023	0.083	0.011	0.065	44.20	55.80	-2.90
WDD005	WDD0229	144	147	########	########	0.023	0.011	0.039	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0230	147	150	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0231	150	153	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0232	153	156	########	########	0.023	0.002	0.007	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0233	156	159	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0234	159	162	########	########	0.023	0.011	0.039	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0235	162	165	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0236	165	168	########	########	0.023	0.020	0.071	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0237	168	171	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0238	171	174	########	########	0.023	0.011	0.039	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0239	174	177	########	########	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0240	177	180	########	########	0.023	0.013	0.046	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0240	177	180	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0240	177	180	########	########	0.023	0.009	0.032	<0.01	<0.01	0.00	100.00	-100.00
WDD005	WDD0240	177	180										
WDD006	WDD0001	0	3	########	########	0.023	0.023	0.083	0.011	0.065	44.20	55.80	-2.90
WDD006	WDD0002	3	6	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0003	6	9	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0004	9	12	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0005	12	15	########	########	0.023	0.007	0.025	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0006	15	18	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0006	15	18	########	########	0.070	0.009	0.032	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0007	18	21	########	########	0.023	0.004	0.014	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0008	21	24	########	########	0.047	0.004	0.014	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0009	24	27	########	########	0.023	0.003	0.011	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0010	27	30	########	########	0.023	0.023	0.083	0.039	0.238	74.21	25.79	12.10
WDD006	WDD0011	30	33	########	########	0.023	0.005	0.018	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0012	33	36	########	########	0.023	0.023	0.083	0.020	0.121	59.39	40.61	4.69
WDD006	WDD0013	36	39	########	########	0.023	0.023	0.083	0.036	0.219	72.63	27.37	11.32
WDD006	WDD0014	39	42	########	########	0.023	0.023	0.083	0.011	0.065	44.20	55.80	-2.90
WDD006	WDD0015	42	45	########	########	0.023	0.008	0.028	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0016	45	48	########	########	0.023	0.011	0.039	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0017	48	51	########	########	0.023	0.023	0.081	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0018	51	54	########	########	0.023	0.023	0.083	0.047	0.287	77.64	22.36	13.82
WDD006	WDD0019	54	57	########	########	0.023	0.023	0.083	0.015	0.090	52.15	47.85	1.08
WDD006	WDD0020	57	60	########	########	0.023	0.023	0.083	0.073	0.447	84.40	15.60	17.20
WDD006	WDD0021	60	63	########	########	0.023	0.023	0.083	0.010	0.059	41.78	58.22	-4.11
WDD006	WDD0022	63	66	########	########	0.023	0.023	0.083	0.007	0.041	33.07	66.93	-8.47
WDD006	WDD0023	66	69	########	########	0.023	0.023	0.083	0.016	0.096	53.80	46.20	1.90
WDD006	WDD0024	69	72	########	########	0.023	0.023	0.083	0.021	0.127	60.58	39.42	5.29
WDD006	WDD0025	72	75	########	########	0.023	0.023	0.083	0.095	0.583	87.57	12.43	18.79
WDD006	WDD0026	75	78	########	########	0.023	0.023	0.083	0.001	0.004	4.51	95.49	-22.74
WDD006	WDD0027	78	81	########	########	0.023	0.014	0.050	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0028	81	84	########	########	0.023	0.009	0.032	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0029	84	87	########	########	0.023	0.014	0.050	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0030	87	90	########	########	0.023	0.023	0.083	0.010	0.059	41.78	58.22	-4.11
WDD006	WDD0031	90	93	########	########	0.023	0.023	0.083	0.003	0.016	16.40	83.60	-16.80
WDD006	WDD0032	93	96	########	########	0.047	0.047	0.165	0.062	0.383	69.87	30.13	9.93
WDD006	WDD0033	96	99	########	########	0.023	0.023	0.083	0.038	0.232	73.70	26.30	11.85
WDD006	WDD0034	99	102	########	########	0.023	0.023	0.083	0.016	0.096	53.80	46.20	1.90
WDD006	WDD0035	102	105	########	########	0.023	0.023	0.083	0.048	0.293	78.01	21.99	14.00
WDD006	WDD0036	105	108	########	########	0.023	0.015	0.053	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0037	108	111	########	########	0.023	0.023	0.083	0.010	0.059	41.78	58.22	-4.11
WDD006	WDD0038	111	114	########	########	0.093	0.093	0.331	0.120	0.736	69.00	31.00	9.50
WDD006	WDD0039	114	117	########	########	0.023	0.023	0.083	0.012	0.072	46.42	53.58	-1.79
WDD006	WDD0040	117	120	########	0.04	0.093	0.089	0.315	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0041	120	123	########	0.03	0.070	0.070	0.248	0.007	0.043	14.63	85.37	-17.69
WDD006	WDD0042	123	126	########	0.01	0.023	0.014	0.050	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0043	126	129	########	0.01	0.023	0.023	0.083	0.001	0.004	4.51	95.49	-22.74
WDD006	WDD0044	129	132	########	0.03	0.070	0.070	0.248	0.044	0.270	52.15	47.85	1.08
WDD006	WDD0045	132	135	########	0.21	0.491	0.460	1.628	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0046	135	138	########	0.15	0.350	0.350	1.240	0.051	0.311	20.05	79.95	-14.97
WDD006	WDD0047	138	141	########	0.12	0.280	0.280	0.992	0.004	0.022	2.19	97.81	-23.90
WDD006	WDD0048	141	144	########	0.06	0.140	0.140	0.496	0.031	0.190	27.66	72.34	-11.17
WDD006	WDD0049	144	147	########	0.03	0.070	0.070	0.248	0.053	0.326	56.77	43.23	3.39
WDD006	WDD0050	147	150	########	0.06	0.140	0.133	0.471	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0051	150	153	########	########	<0.01	<0.01	<0.01	0.017	0.105	100.00	0.00	25.00
WDD006	WDD0052	153	156	########	0.01	0.023	0.006	0.021	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0053	156	159	########	########	<0.01	<0.01	<0.01	0.027	0.166	100.00	0.00	25.00
WDD006	WDD0054	159	162	########	0.03	0.070	0.070	0.248	0.007	0.043	14.63	85.37	-17.69
WDD006	WDD0055	162	165	########	########	<0.01	<0.01	<0.01	0.035	0.216	100.00	0.00	25.00
WDD006	WDD0056	165	168	########	0.01	0.023	0.023	0.083	0.007	0.041	33.07	66.93	-8.47
WDD006	WDD0057	168	171	########	0.01	0.023	0.023	0.083	0.015	0.090	52.15	47.85	1.08
WDD006	WDD0057	168	171	########	0.01	0.023	0.023	0.083	0.039	0.238	74.21	25.79	12.10
WDD006	WDD0057	168	171			<0.01	<0.01	<0.01	<0.01	<0.01	#DIV/0!	#DIV/0!	#DIV/0!
WDD006	WDD0058	171	174	########	0.01	0.023	0.023	0.083	0.013	0.078	48.48	51.52	-0.76
WDD006	WDD0059	174	177	########	########	<0.01	<0.01	<0.01	0.005	0.031	100.00	0.00	25.00
WDD006	WDD0060	177	180	########	0.01	0.023	0.014	0.050	<0.01	<0.01	0.00	100.00	-100.00
WDD006	WDD0060	177	180	########	0.01	0.023	0.014	0.050	<0.01	<0.01	0.00	100.00	-100.00

APPENDIX 3C-3

Scrivener – A briefing report on the occurrence and tenor of sulphides in the Hemerdon Tungsten Deposit, South Devon, England

A briefing report on the occurrence and tenor of sulphides in the Hemerdon Tungsten Deposit,South Devon, England

for

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by

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November 2012

1 Introduction

I am an independent consultant geologist with considerable experience in SW England and have been asked by Wolf Minerals Ltd. to provide a briefing report on the following

- A brief description of the Hemerdon Deposit and the occurrence of sulphides in the ore and enclosing rocks
- A review of the British Geological Survey Open Report OR/10/14 'The nature of waste associated with closed mines in England and Wales' insofar as that report deals with the mineralisation of South-west England
- Discussion of the potential of waste from Hemerdon to generate acid mine drainage, involving the content of this report and recent analytical work reported to Wolf Minerals

This work has been undertaken as a desk study, backed up by fieldwork on pit sections and core examination over the last 35 years.

2 The Hemerdon Deposit

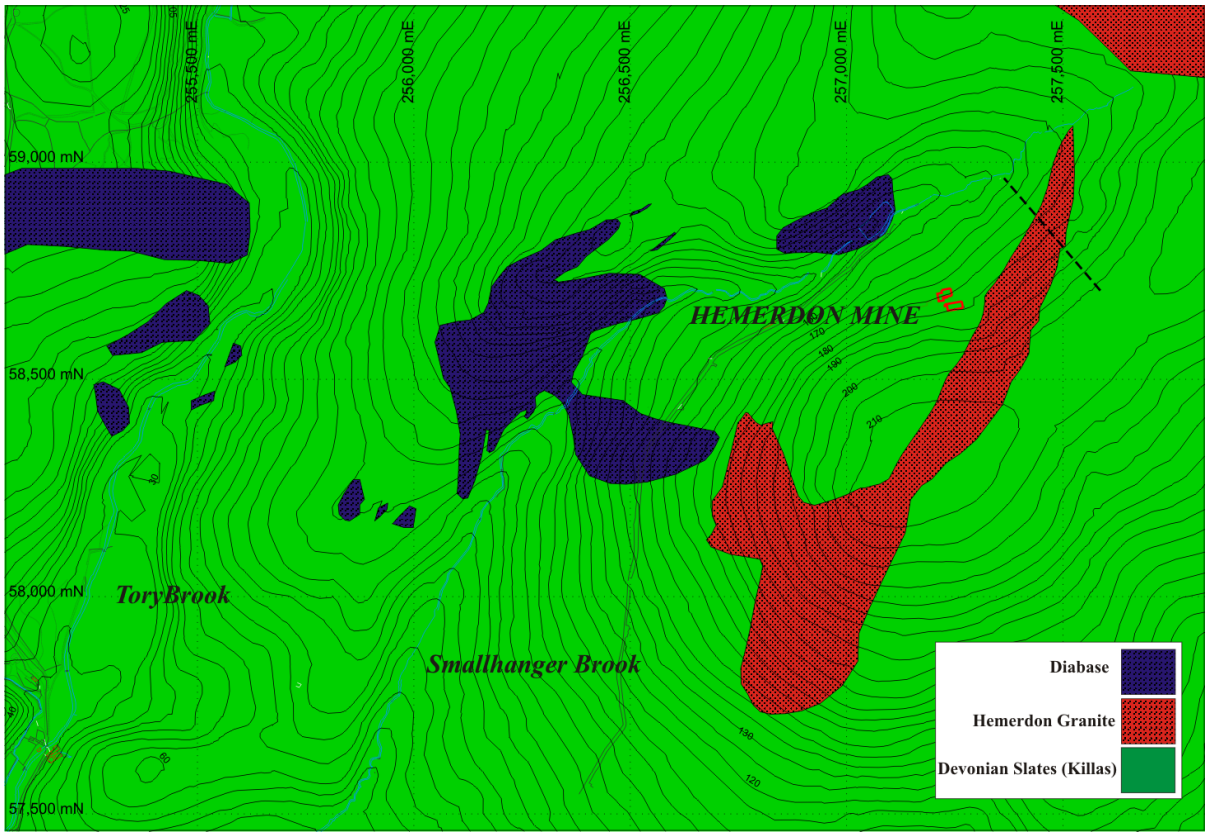

Plate 1: Geological map of the area around Hemerdon Mine (diagram by Wolf minerals).

2.1 The Hemerdon orebody

The Hemerdon deposit is hosted within and around a dyke-like body of porphyritic granite and granite porphyry, known as the Hemerdon Granite, which forms a cupola or apophysyis, to the extreme SW of the main body of the Dartmoor Granite, and cropping out some 1200m NW of the village of Sparkwell (Plate 1). The country rock around the Hemerdon Granite is late Devonian slate, with minor basic volcanic rocks, mapped as 'diabase'. The northern part of the Hemerdon Granite is essentially a NNE- trending dyke, some 140m wide and dipping steeply towards the E: this hosts a 'sheeted vein complex' of narrow, quartz veins, bearing wolframite and cassiterite, with minor arsenopyrite and accessory sulphide minerals. The vein complex measures at least 600m from NNE to SSW and is about 140m wide: mineralization has been demonstrated by drilling to persist to 400m below ground surface. At least three sets of veins have been distinguished, as described below:-

- Group 1 – Dipping at between 35^{o} and 55^{o} towards the NW, and containing variable amounts of wolframite (iron-manganese tungstate) and cassiterite (tin dioxide). Most of these veins have 'greisen' borders, where the host granite has been altered by reaction with hydrothermal fluids to a grey-coloured mass of quartz and white mica, at the expense of feldspar (see cover image and Plate 2).
- Group 2 - Steeply dipping and mostly parallel with the walls of the NNE-trending granite dyke. These quartz veins also bear wolframite and some feldspar, but are more weakly mineralised than Group1: they lack greisen borders.
- Group 3 - Group 1 veins can be shown to be earlier in formation than Group 2, and both sets are cut by a third group of late-stage extensional fractures carrying iron oxide minerals (mostly haematite) and mostly trending NW-SE

2.2 The host rocks

The host rocks around the orebody are slates of Upper Devonian age: these rocks are now referred to the Tavy Formation of Leveridge and others (2002), and Leveridge (personal communication), which form part of the Tavy Basin (Middle Devonian to Lower Carboniferous). These strata are mostly grey mudrocks, with a well-developed cleavage fabric: silty bands and laminations are common and may be

locally abundant. Away from the metamorphic aureole of the Dartmoor Granite, slates of the Tavy Formation are mostly greenish grey in colour, and very micaceous. However, to the north of Hemerdon Mine, going towards the contact of the Dartmoor granite, at surface the slates are dark grey in colour and are hard and blocky, with silicification due to thermal metamorphism, and also with local thermal spotting. Around, and to the south of the mine, at surface, the slates are paler grey and micaceous, in places showing the effects of argillic alteration. Where seen in the Amax borehole cores the slates are mostly brownish-grey on weathered surfaces, and medium to dark grey on freshly broken faces. Brown and reddish brown iron oxide staining is common and argillic alteration is present in places.

Plate 2 – Group 1 veins showing prominent greisen borders: note late-stage haematite vein at bottom right. Photo: R C Scrivener

The igneous rocks shown on the geological map (Plate 1) were described in the 1894 Ussher Survey as ‘‘diabase’, an obsolete term for a fine-grained or aphanitic basalt, rich in labradorite feldspar. Rocks of this type are quite well-exposed in the Bottle Hill Mine area to the north-west of the Hemerdon Mine and are hard and fine-grained, with a distinct shear fabric. These basic igneous rocks are contemporaneous with the enclosing slates, and are therefore also of Upper Devonian age’.

3 Sulphides at Hemerdon

The most detailed account of mineralogy at Hemerdon is provided by Schneider (1990) in an unpublished PhD thesis largely based on geochemical and mineralogical work on cores from the Amax period of exploration at the mine. This has been supplemented by reference to the various reports on mineralogy to Amax, by the work of Cameron (1951), and by notes made by the author during earlier investigations. As noted above, the veins at Hemerdon contain quartz together with wolframite, cassiterite and some K-feldspar Scheelite (calcium tungstate) is present in small quantities throughout, and appears to be the result of alteration of wolframite. As to sulphides:-

- Arsenopyrite (arsenic+iron sulphide) is present as a minor phase in many of the veins together with small amounts of löllingite (iron arsenide). In the near-surface weathered zone, there is some alteration of arsenopyrite to the secondary minerals scorodite and pharmacosiderite.

Other sulphides are present in very minor amounts as accessory minerals. These include:

- Sphalerite – zinc sulphide
- Marcasite – iron sulphide
- Pyrite – iron sulphide
- Chalcopyrite – copper+iron sulphide
- Digenite – copper sulphide
- Bismuthinite – bismuth sulphide
- Molybdenite – molybdenum sulphide

Other accessory minerals include fluorite, siderite, rutile, native bismuth and colombo-tantalite.

The minerals recorded are present in the various quartz veins of groups 1 and 2. No sulphides are recorded in the late iron oxide veins, and there is no record of sulphides being present in either the greisen vein margins, or in the intervening granite. This last is supported by the geochemical data presented by Schneider and is also a feature of the greisens investigated at St. Michael's Mount (Moore, 1977) and at Cligga Head (Hall, 1971). The absence of sulphides from the greisen vein margins and from the intervening granite is important, as it suggests that most of the sulphide content of the deposit at Hemerdon is in the veins and will be included in the pre-concentrate, from which it can be separated by flotation.

Recent work for Wolf Minerals Ltd., carried out by Nagrom has produced geochemical analyses for 271 samples of granite, greisen and vein material taken from the diamond drill boreholes put down in 2007: the report in full is at Annex 1. Included in the data are total sulphide analyses for the deposit, which, for the 271 samples are:

- Mean 0.01%
- Median 0.01%
- Max 0.10%
- Min 0.01%

These results strongly suggest that the Hemerdon ore deposit is low-sulphidation and that the potential for generation from the ore waste is very low. Other features of the Nagrom Report confirm the low levels of U and Th within the ore deposit compared with other SW England granites, and highlight the evolved nature of the Hemerdon W-Sn system.

The host rocks around the deposit are, as described above, late Devonian mudstones and siltstones showing some low-grade regional metamorphism and a well- developed cleavage fabric. Visual inspection of these rocks shows no sign of included sulphides and the Amax cores, which have been stored on the site for many years show no signs of the oxidative degradation typical of sulphide-rich sediments. During logging of the cores, tests with dilute hydrochloric acid showed only occasional reaction with cold acid, but a slow reaction with warm acid is more common, suggesting low levels of carbonates such as dolomite, or perhaps ankerite. Silicate assemblages with low carbonate content are unlikely to degrade by oxidative weathering to generate acid fluids. This is confirmed by the recent Coffey report on the 'Waste and tailings geochemistry' appended at Annex 2, both for weathered and unweathered 'killas' waste.

4 Discussion of the BGS Open Report OR/10/14

The British Geological Survey Open Report OR/10/14 ‘The nature of waste associated with closed mines in England and Wales’ (Palumbo-Roe and Colman, 2010) presents a very simplistic view of the South-west England orefield, mostly citing old references and without taking into account modern publications and reviews of the subject, such as Jackson *et al.* (1989), Alderton, (1993), Selwood *et al* , (1998) and Scrivener in Brenchley and Rawson, (2006). The text of the report implies that sulphides are an essential component of the veins and states that *‘Pyrite was ubiquitous……’* . This is certainly not the case. Recent publications demonstrate quite clearly that the granite-related vein systems developed from the deposition of early, low-sulphidation ores with, in some districts, a later overprint of base metal sulphide assemblages. The early low-sulphidation deposits are generated by fluids of direct magmatic departure, and so are situated within the granite plutons or in their immediate vicinity (eg. Plate 3): examples include the sheeted greisen vein

Plate 3 Sheeted vein complex North Rocks section, Goonbarrow China Clay Pit – an example of a low-sulphidation tin deposit, Veins carry quartz-tourmaline-cassiterite, sulphides are absent.Photo: R C Scrivener

complexes (eg. Hemerdon and Cligga Head) and quartz cassiterite-tourmaline-Fe oxide veins (eg the tin lodes of the Dartmoor and Bodmin Moor granites): the latter

either contain low levels of sulphide minerals or none at all (Beer and Scrivener, 1982, Scrivener, 1982, Miller, 1994). Rather, the mineral assemblages are dominated by oxide phases including cassiterite, hematite, and rutile, with, in places the Fe-Mn tungstate wolframite. The high levels of sulphide minerals characteristic of the 'mainstage' polymetallic veins are the result of later and more extensive circulation of hydrothermal fluids, with the sulphides sourced from the rocks external to the granites (Bromley, 1989, Shepherd and others, 1985, Shepherd and Scrivener, 1987)). The sulphide–dominated deposits can extend some distance from the granites, with the locations being controlled by the presence of appropriate metal source rocks (Bromley 1989, Scrivener, 2006). Districts notable for past production from sulphide-rich veins include (Dines, 1956) parts of the Redruth-Camborne orefield and its eastward extension, the mining district to the south and east of the St. Austell Granite, the Caradon-Phoenix district of southern Bodmin Moor and the Kit Hill – Gunnislake mining district (including Devon Great Consols).

As to the potential for the host rocks of mineral deposits in SW Englansd to generate acid mine waste, the BGS report is again very general in its approach, characterising the non-granite rocks of the peninsula as 'killas', described as '……metamorphosed

Plate 4 Old Bal Lode, Levant Mine, Pendeen, Cornwall – an example of a sulphide-rich vein carrying chalcopyrite, pyrite and sphalerite in a quarz-chlorite gangue. Note blue copper secondary minerals and orange ochre from the breakdown of sulphides. Photo M.Mount

sediments, mainly mudstones or sandstones'. There is a further statement that 'Granite and killas both give rise to slightly to strongly acidic groundwater that is not buffered by the surrounding rocks'. Both of these statements are inaccurate and require discussion.

The Devonian and Carboniferous rocks of the SW England peninsula accumulated in a number of marine basins, originally physically separate, but subsequently juxtaposed by the tectonic movements of the Variscan Orogeny (Leveridge and Hartley in Brenchley and Rawson, 2006). The strata show considerable heterogeneity, with representative formations dominated by black mudstones, grey, purple and green mudstones, siltstones, massive sandstones and more thinly bedded turbidite sandstones. Towards the east and north of the region there are reef and bedded limestones, and the adjacent mudstones and siltstones may be calcareous. Interbedded with sedimentary rocks are volcanic strata of basalt and volcaniclastics and there are also contemporaneous basic intrusions. These basic igneous rocks may reach considerable thickness and are particularly well-developed around the middle to late Devonian boundary. The rocks of the Middle Devonian to Early Carboniferous Tavy Basin, including the strata around the Hemerdon deposit, formed between the limestone-rich successions of the Plymouth district and similar successions in the Torbay district, with similar fossil assemblages and the local carbonate rocks reflected in the intervening slates.

In the situation described above the groundwaters are variable in chemistry. While it is certainly true the most of the groundwater in the region is soft, and that slightly more acid conditions are true for the granites, there are areas, particularly in the east of the region, from Plymouth to Torbay, where neutral or slightly alkaline groundwaters are common. By way of example, the pH values for a group of groundwaters from the Falmouth-Camborne district range from 5.13 to 6.94, with a mean of 6.25 (n = 6) (Leveridge and others, 1990). The range for the Plymouth district quoted by Leveridge and others (2002) is from 5.0 (from sandstone source rocks) to 7.5 (from limestone and mudstone source rocks). The areas underlain by black mudstones and including parts of the lower Carboniferous succession from north Cornwall to north Dartmoor, which are sulphidic and rich in heavy metals have much greater potential for acid generation.

5 Summary

- The Hemerdon Deposit is a greisen vein stockwork formed by hydraulic fracturing of a pre-existing granite host by high-temperature hydrothermal fluids of direct magmatic departure
- The Hemerdon Deposit is similar to other essentially low-sulphidation Sn/W deposits in the region and there is no evidence of an overprint by sulphide mineralisation
- Very low sulphide levels in the greisen vein margins and intervening granite implies that much of the low sulphide content in the deposit will be included in the pre-concentrate.
- The field and core examination evidence and local hydrogeological evidence, taken together with the recent Nagrom and Coffey reports suggest that the waste from the projected Hemerdon Mine will have low very potential for the generation of acid mine drainage

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4th November 2012

References

Alderton, D. H. M. 1993. Mineralization associated with the Cornubian granite batholith. In: Pattrick, R. A. D. & Polya, D. A. (eds.). *Mineralization in the British Isles, Chapman and Hall*, London, 270-354

Beer, K. E., & Scrivener, R. C., 1982. Metalliferous mineralisation. 117-147 in Durrance, E. M., & Laming, D. J. C., (editors). *The Geology of Devon* (Exeter: University of Exeter).

Bromley, A. V. 1989. *Field Guide to the Cornubian orefield.* 6th International Symposium on water-rock interaction, Malvern, 1989. International Association of Geochemistry and Cosmochemistry.

Cameron, J. 1951, The geology of the Hemerdon Wolfram mine, Devon. *Bulletin of the Institute of Mining and Metallurgy,* Trans. 61/1 No. 534

Dines, H. G. 1956. The metalliferous mining region of South-West England. 2 vols, HMSO, London, 795 pp.

Hall, A. 1971, Greisenisation in the granite of Cligga Head, Cornwall. *Proceedings of the geologists' Association*, **82**, 209-230

Jackson, N.J., Willis-Richards, J., Manning, D.A.C. and Sams, M.S. 1989. Evolution of the Cornubian ore field, South-west England: Part II – mineral deposits and ore forming processes. *Economic Geology,* **84**, 1101 – 1133

Leveridge, B. E., Holder, M. T. & Goode, A. J. J. 1990. Geology of the country around Falmouth. *Memoir of the British Geological Survey*, Sheet 352 (England and Wales).

Leveridge, B. E., Holder, M. T., Goode, A. J. J., Scrivener, R. C. Jones, N. S. & Merriman, R. J. 2002. The Plymouth and south-east Cornwall area – a concise account of geology. *Memoir of the British Geological Survey*, Sheet 348 (England and Wales).

Leveridge, B. E. and Hartley, A.J. Chapter 10, 'The Variscan Orogeny', in Brenchley, P.J. and Rawson, P. F. (editors) 2006. *Geology of England and Wales, s*econd edition. London: Geological Society of London

Miller, M. F. 1994. *Geochemical and isotopic characteristics of palaeo-hydrothermal fluids related to granite magmatism*, SW England. Unpublished PhD. Thesis, The OpenUniversity

Moore, F. 1977. The occurrence of topaz-rich greisens in St. Michael's Mount< Cornwall. *Proceedings of the Ussher Society*, **4**, 49 - 56

Schneider, F. 1990. *Petrography, petrology and geochemistry of the Dartmoor Granite Massif (Devon, UK) and associated mineralisation*. Unpublished PhD Thesis: Ecole des Mines de Paris

Scrivener, R.C. 1982. *Tin and related mineralisation of the Dartmoor granite*, Unpublished Ph.D. Thesis: University of Exeter.

Scrivener, R. C., Chapter 11, 'Cornubian granites and mineralization of SW England', in Brenchley, P.J. and Rawson, P. F. (editors) 2006. *Geology of England and Wales, s*econd edition. London: Geological Society of London

Selwood, E.B, Durrance, E.M. and Bristow, C.M. (editors). 1998. *The geology of Cornwall.* Exeter: University of Exeter

Shepherd, T.J., Miller, M F., Scrivener, R.C. & Darbyshire, D.P.F. 1985. Hydrothermal fluid evolution in relation to mineralisation in southwest England, with special reference to the Dartmoor-Bodmin area. 345-364 in *High heat production granites, hydrothermal circulation and ore genesis.* (Institution of Mine and Metallurgy, London).

Shepherd, T. J., & Scrivener, R. C. 1987. Role of basinal brines in the genesis of polymetallic vein deposits, Kit Hill - Gunnislake area, SW England. *Proceedings of the Ussher Society* **6**, 491-497.

APPENDIX 3C-4

Sample Numbers in relation to borehole, depth and lithology

SGS Sample #	BH ID	Lithology	Depth
0001	DDH1005	Greisen	11m
0002	DDH1005	Killas	38m
0003	DDH1005	Killas	46m
0004	DDH1005	Killas	63m
0005	DDH1005	Quartz	99m
0006	DDH1005	Greisen	100m
0007	DDH1005	Granite	101m
0008	DDH1005	Greisen	103m
0009	DDH1005	Kaolinised Granite	108m
0010	DDH1005	Granite	123m
0011	DDH1005	Greisen	147m
0012	DDH1005	Kaolinised Granite	149m
0013	DDH1005	Killas	160m
0014	DDH1005	Greisen	170m
0015	DDH1005	Killas	176m
0016	DDH1005	Quartz	178.5m
0017	DDH1005	Killas	189m
0018	DDH1007	Kaolinised Granite	1.5m
0019	DDH1007	Kaolinised Granite	7.5m
0020	DDH1007	Quartz	8.5m
0021	DDH1007	Kaolinised Granite	12.5m
0022	DDH1007	Killas	24.5m
0023	DDH1007	Killas	33.5m
0024	DDH1007	Quartz	38m
0025	DDH1007	Killas	39.5m
0026	DDH1007	Killas	50m
0027	DDH1007	Killas	60m
0028	DDH1007	Greisen	66m
0029	DDH1008	Killas	13m
0030	DDH1008	Quartz	18m
0031	DDH1008	Killas	38m
0032	DDH1008	Killas	42m
0033	DDH1008	Greisen	79m
0034	DDH1008	Killas	99m
0035	DDH1008	Killas	105m
0036	DDH1008	Quartz	106m
0037	DDH1008	Greisen	118m
0038	DDH1008	Quartz	119m
0039	DDH1008	Greisen	147m
0040	DDH1008	Granite	162m
0041	DDH1008	Greisen	214m
0042	DDH1020	Kaolinised Granite	30m
0043	DDH1020	Granite	118m
0044	DDH1020	Granite	135m
0045	DDH1020	Quartz	170m
0046	DDH1020	Killas	228m
0047	DDH1020	Killas	236m
0048	DDH1025	Killas	14m
0049	DDH1025	Killas	21.5m
0050	DDH1025	Greisen	24m
0051	DDH1025	Killas	32m
0052	DDH1025	Killas	39m
0063	DDH1030	Killas	7m
0064	DDH1030	Killas	15m
0065	DDH1030	Killas	27.2m
0066	DDH1030	Killas	37.7m
0067	DDH1030	Killas	43m
0068	DDH1030	Killas	75m
0069	DDH1030	Greisenised Granite	126m
0070	DDH1030	Kaolinised Granite	134m
0071	DDH1030	Kaolinised Granite	140m
0072	DDH1030	Greisenised Granite	148m
0073	DDH1030	Kaolinised Granite	164m
0074	DDH1030	Kaolinised Granite	196m
0075	DDH1030	Kaolinised Granite	214m
0076	DDH1030	Kaolinised Granite	182m
0077	DDH1030	Granite	222m
0078	DDH1030	Greisenised Granite	223m
0079	DDH1030	Kaolinised Granite	250m
0080	DDH1030	Kaolinised Granite	254m
0081	DDH1030	Greisenised Granite	267m
0082	DDH1031	Kaolinised Granite	27m
0083	DDH1032	Killas	4.5m
0084	DDH1032	Killas	31.5m
0085	DDH1032	Killas	55.5m
0086	DDH1032	Killas	70m
0087	DDH1032	Granite	98m
0088	DDH1032	Greisen	127m
0089	DDH1033	Greisen	10m
0090	DDH1036	Killas	117m
0091	DDH1036	Kaolinised Granite	233m
0092	DDH1036	Granite	239m
0093	DDH1039	Granite	54m
0094	DDH1039	Granite	75m
0095	DDH1039	Granite	136m
0096	DDH1046	Killas	6m
0097	DDH1046	Killas	15m
0098	DDH1046	Quartz	42m
0099	DDH1046	Killas	48.5m
0100	DDH1046	Killas	71m
0101	DDH1046	Killas	79m
0102	DDH1046	Killas	95m
0103	DDH1047	Killas	25m
0104	DDH1047	Granite	87m
0105	DDH1047	Kaolinised Granite	100.5m
0106	DDH1051	Kaolinised Granite	36m
0107	DDH1051	Killas	111m
0108	DDH1051	Killas	130m
0109	DDH1052	Brecciated Killas	16m
0110	DDH1052	Brecciated Killas	17m
0111	DDH1052	KGR and Weathered	26m
0112	DDH1052	Kaolinised Granite	54m
0113	DDH1052	Kaolinised Granite	67.5m
0114	DDH1052	Kaolinised Granite	76m
0115	DDH1052	Kaolinised Granite	82m
0116	DDH1052	Kaolinised Granite	93m
0117	DDH1052	Kaolinised Granite	114.5m
0118	DDH1052	Kaolinised Granite	117m
0119	DDH1052	Kaolinised Granite	127m
0120	DDH1052	Granite-Iron Oxide	134m
0121	DDH1052	Granite	145m
0122	DDH1052	Granite	195m
0123	DDH1052	Kaolinised Granite	200m
0124	DDH1053	Granite	99m
0125	DDH1053	Granite	168m
0126	DDH1053	Kaolinised Granite	135m
0127	DDH1068	Granite	6m
0128	DDH1068	Killas	193m
0129	DDH1068	Killas	200m
0130	DDH1071	Kaolinised Granite	18m
0131	DDH1071	Killas	51m
0132	DDH1071	Killas	60m
0133	DDH1071	Killas	75m
0134	DDH1071	Killas	93m
0135	DDH1071	Killas	102m
0136	DDH1071	Killas	120m
0137	DDH1071	Killas	132m
0138	DDH1071	Killas	141m
0139	DDH1071	Killas	154m
0140	DDH1030	Killas	79m
0141	Composite	T710 -9mm +0.5mm	
0142	Composite	TT710 Composite Tails	
0182	Composite	Hard Granite Float	
0183	Composite	Soft Granite Float	
0184	Composite	Hard Granite Tails	
0185	Composite	Soft Granite Tails	

APPENDIX 3C-5

Phase II Waste Rock BHs

Sample Photographs and Geological Logs

Borehole 1 Samples

Sample 1 13.10 to 13.45

Sample 2 17.25 to 17.63

Sample 3 20.45 to 20.98

Sample 4 23.60 to 23.95

Sample 5 26.21 to 26.87

Sample 6 28.48 to 29.00

Sample 7 30.80 to 31.30

Sample 8 34.76 to 35.22

Sample 9 36.98 to 37.42

Sample 10 40.60 to 41.03

Borehole 2 Samples

Sample 1 4.55 to 4.80

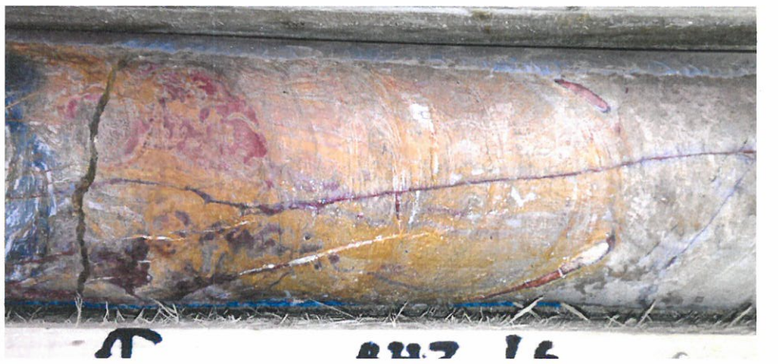
Sample 2 9.40 to 9.60

Sample 3 19.10 to 19.40

Sample 4 23.70 to 23.95

Sample 5 26.70 to 26.95

Sample 6 31.60 to 31.90



Sample 7 37.00 to 37.20

Sample 8 43.00 to 43.25

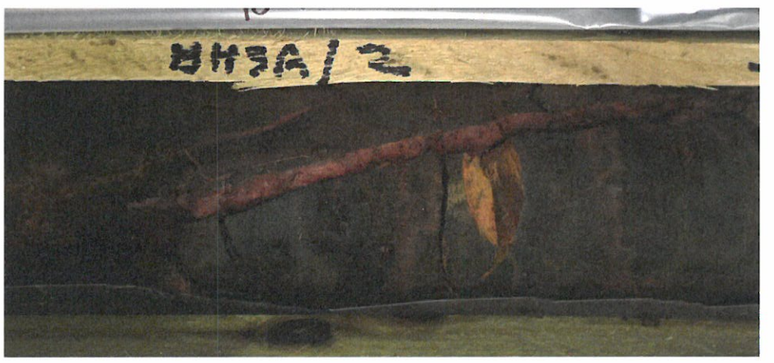
Sample 9 48.80 to 49.05

Sample 10 49.20 to 49.50

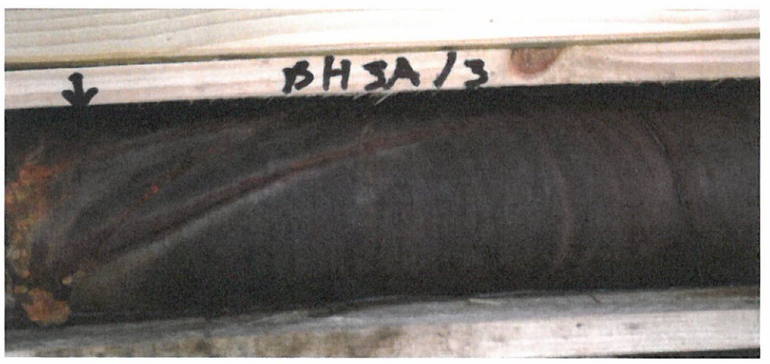
Borehole 3A Samples

Sample 1 3.90 to 4.25

Sample 2 10.10 to 10.45

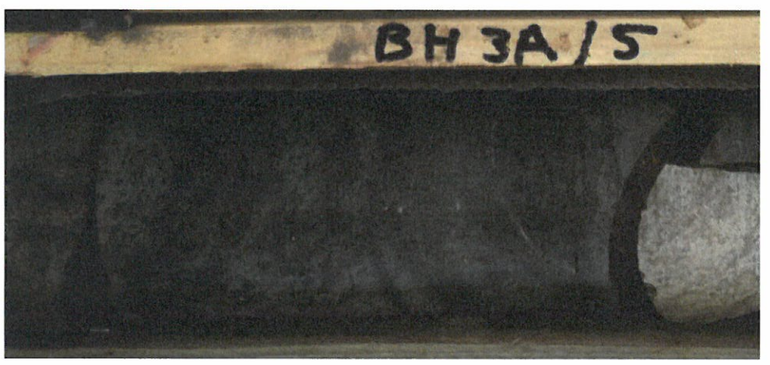


Sample 3 14.00 to 14.35



Sample 4 21.35 to 21.75

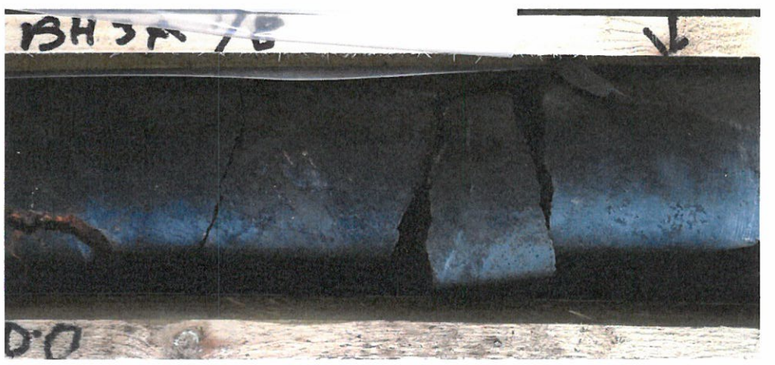
Sample 5 26.30 to 26.70



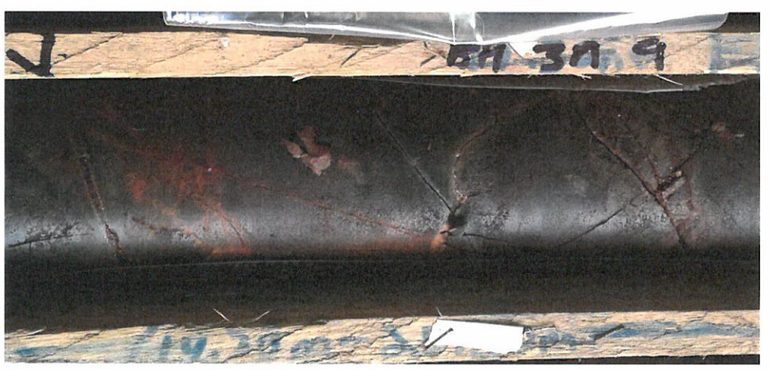
Sample 6 30.45 to 30.90

Sample 7 35.15 to 35.50

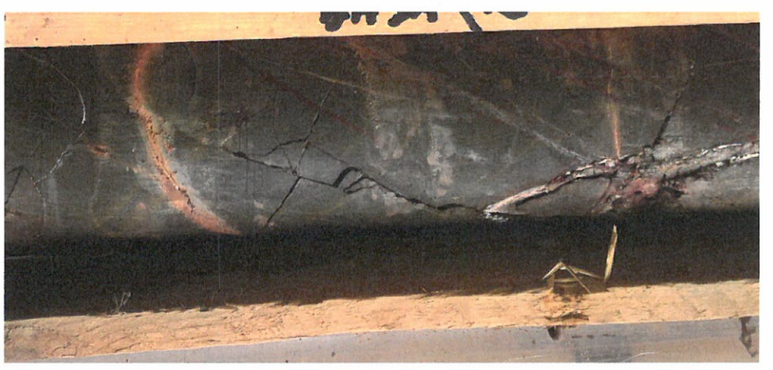
Sample 8 38.70 to 38.95



Sample 9 43.25 to 43.60



Sample 10 47.20 to 47.60



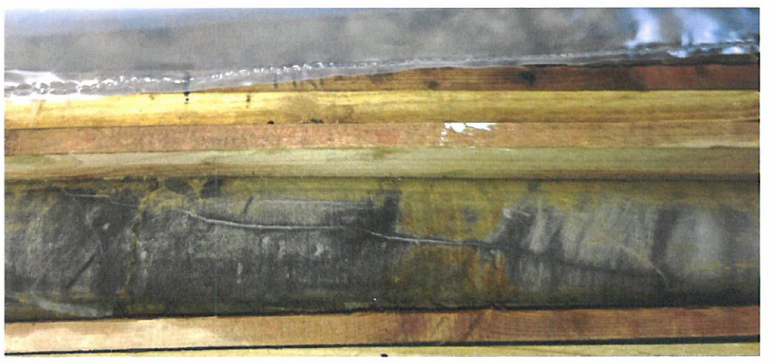
Borehole 4 Samples

Sample 1 6.73 to 7.11

Sample 2 13.95 to 14.50

Sample 3 17.35 to 17.90

Sample 4 23.86 to 24.40



Sample 5 27.88 to 29.41

Sample 6 32.85 to 33.37

Sample 7 35.95 to 36.35

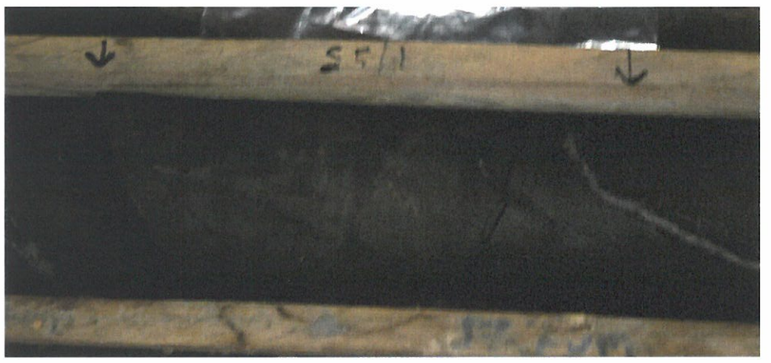
Sample 8 39.18 to 39.78

Sample 9 45.43 to 45.91

Sample 10 49.60 to 50.10

Borehole 5 Samples

Sample 1 5.75 to 5.95



Sample 2 11.60 to 11.88

Sample 3 16.66 to 16.94

Sample 4 20.22 to 20.50

Sample 5 27.15 to 27.50

Sample 6 30.72 to 31.00

Sample 7 37.60 to 37.99

Sample 8 39.78 to 40.00

Sample 9 42.75 to 43.04

Sample 10 46.46 to 46.77

Borehole 6 Samples

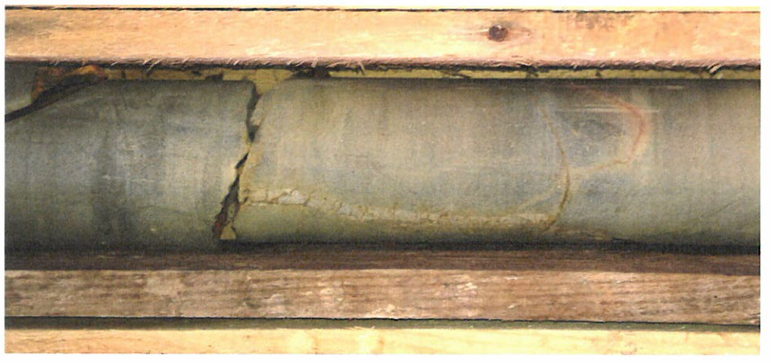
Sample 1 10.45 to 10.90

Sample 2 12.55 to 12.85

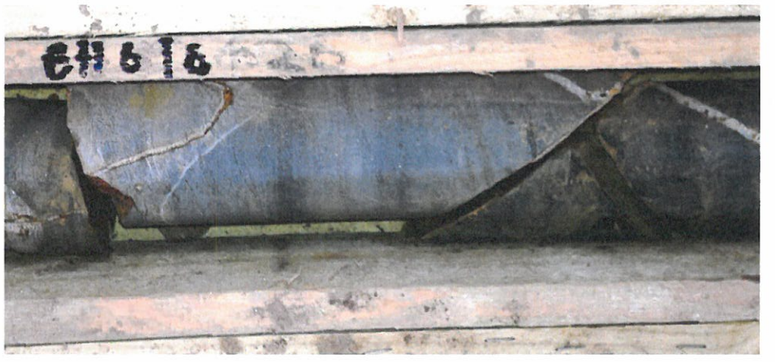
Sample 3 21.40 to 21.75

Sample 4 26.85 to 27.30

Sample 5 32.90 to 33.30



Sample 6 37.10 to 37.60



Sample 7 40.90 to 41.40

Sample 8 17.90 to 18.30 (out of sequence)

Sample 9 44.40 to 44.90

Sample 10 49.30 to 49.80

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH1
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	20-03-13 26-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			1 of 6

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
3.30						3.30 - 6.10 Non-intact		Soft becoming stiff, white and light brown, locally slightly gravelly, CLAY. (Completely weathered METABASIC INTRUSION).		
	94 (0) 0	NI			(1.60)					
4.90					4.90					
	53 (15) 0	NI 60 80						Very weak locally extremely weak, dark grey light brown and cream, highly weathered METABASITE with occasional quartz veins. Locally completely weathered to hard cream colour clay. (METABASIC INTRUSION). Fractures are closely to medium spaced, undulating rough to planar smooth, dipping at 10° to 45°.		
6.40						6.30 - 7.10 Non-intact				
	84 (36) 34	NI 70 270								
8.00						7.90 - 8.15 Non-intact				
	100 (85) 42	NI 80 300								
9.50						8.90 - 9.00 Non-intact				
						9.45 - 12.05 Non-intact				
	64 (0) 0	NI 40 80			(10.10)					
11.00										

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
20-03-13	17.00	3.30	3.30	92mm		
21-03-13	17.00	11.00	9.30	92mm		

Rotary Flush

From	To	Type	Returns
3.3	50.1	water	

General Comments

Borehole open holed to 3.3m. Hole continued by rotary coring using T6116 core barrel and water flush to 19.3m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH1
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	20-03-13 26-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			2 of 6

RUN DETAILS			STRATA							
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
12.00	30 (8)	NI						Very weak locally extremely weak, dark grey light brown and cream, highly weathered METABASITE with occasional quartz veins.		
13.50	62 (13) 1	NI 70 150				12.20 - 13.65 Non-intact		Locally completely weathered to hard cream colour clay. (METABASIC INTRUSION). Fractures are closely to medium spaced, undulating rough to planar smooth, dipping at 10° to 45°. *(continued)*		
15.00	83 (45) 7	NI 60 100			15.00	13.75 - 14.35 Non-intact 14.90 - 17.10 Non-intact				
16.20	100 (0) 0	NI			(1.20) 16.20			Firm to stiff, light and dark grey gravelly CLAY. (Completely weathered METABASIC INTRUSION).		
17.70	0 (0) 0	NI			(1.60) 17.80			Stiff, light brown, CLAY, with occasional gravel and cobble sized fragments of very weak metabasite. (Completely weathered METABASIC INTRUSION).		
19.30	100 (100) 60	60 110 190			(1.40) 19.20			Weak and medium strong, light brown and medium grey, moderately weathered, SLATE, with occasional quartz veins. (UPPER DEVONIAN SLATE). Fractures are generally closely spaced, stepped rough and undulating smooth, dipping at 5° to 45°.		

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
22-03-13	17.00	19.30	9.30	92mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 3.3m. Hole continued by rotary coring using T6116 core barrel and water flush to 19.3m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				**BH1**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	20-03-13 26-03-13			
Engineer		Client		Sheet
		Wolf Minerals (UK) Ltd		3 of 6

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology / Instrument/ Backfill
	90 (60) 38	NI 110 180				19.20 - 19.30 Non-intact		Weak to medium strong, pale grey, slightly weathered, SLATE, with occasional quartz veins. (UPPER DEVONIAN SLATE). Some original laminations still visible and dipping at 45°. Fractures are closely to medium spaced, locally widely spaced, stepped rough to planar smooth, dipping at 10° to 65°. *(continued)*	
21.30						21.00 - 21.70 Non-intact			
	100 (62) 26	NI 70 210				22.45 - 22.65 Non-intact			
22.90									
	85 (81) 63	NI 150 370				24.05 - 24.10 Non-intact 24.30 - 24.35 Non-intact			
24.20					(11.10)				
	100 (93) 80	NI 200 520				25.60 - 25.65 Non-intact			
27.30						27.10 - 27.20 Non-intact			

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 3.3m. Hole continued by rotary coring using T6116 core barrel and water flush to 19.3m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				**BH1**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	20-03-13 26-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			4 of 6

RUN DETAILS			STRATA							
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
	100 (88) 65	NI 150 590				27.70 - 30.00 Non-intact		Weak to medium strong, pale grey, slightly weathered, SLATE, with occasional quartz veins. (UPPER DEVONIAN SLATE). Some original laminations still visible and dipping at 45°. Fractures are closely to medium spaced, locally widely spaced, stepped rough to planar smooth, dipping at 10° to 65°. *(continued)*		
30.30					30.30	30.10 - 30.20 Non-intact				
	98 (85) 39	NI 90 210				31.60 - 31.80 Non-intact 32.20 - 32.30 Non-intact		Medium strong, pale grey and red brown, slightly weathered, SLATE, with frequent quartz veins. (UPPER DEVONIAN SLATE). Fractures are closely to medium spaced, locally widely spaced, stepped rough to planar smooth, dipping at 10° to 65° and rarely near vertical.		
33.40										
	100 (94) 71	NI 160 360				35.15 - 35.25 Non-intact				

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
25-03-13	17.00	33.40	9.30	47.6mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 3.3m. Hole continued by rotary coring using T6116 core barrel and water flush to 19.3m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH1
Job No: RP5534	Date: 20-03-13 26-03-13	Ground Level (m):	Co-Ordinates ():	
Engineer:	Client: Wolf Minerals (UK) Ltd			Sheet: 5 of 6

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology / Instrument/ Backfill
36.50								Medium strong, pale grey and red brown, slightly weathered, SLATE, with frequent quartz veins. (UPPER DEVONIAN SLATE). Fractures are closely to medium spaced, locally widely spaced, stepped rough to planar smooth, dipping at 10° to 65° and rarely near vertical. *(continued)*	
38.90	100 (86) 45	NI 80 350				37.50 - 37.75 Non-intact 38.00 - 38.10 Non-intact			
41.90	96 (83) 62	NI 20 260			(19.80)	39.05 - 39.15 Non-intact 41.20 - 41.25 Non-intact 41.70 - 42.00 Non-intact			

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 3.3m. Hole continued by rotary coring using T6116 core barrel and water flush to 19.3m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor: Ground Search	Method/ Plant Used: Beretta T44	Logged By: PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH1
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	20-03-13 26-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			6 of 6

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
	100 (98) 90	NI 160 320				44.40 - 44.45 Non-intact		Medium strong, pale grey and red brown, slightly weathered, SLATE, with frequent quartz veins. (UPPER DEVONIAN SLATE). Fractures are closely to medium spaced, locally widely spaced, stepped rough to planar smooth, dipping at 10° to 65° and rarely near vertical. *(continued)*		
45.00						45.50 - 45.60 Non-intact				
	100 (83) 72	NI 120 330				46.90 - 47.30 Non-intact				
48.10										
	100 (95) 84	NI 200 360				49.80 - 49.90 Non-intact				
50.10					50.10					

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
26-03-13	17.00	50.10	9.30	47.6mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 3.3m. Hole continued by rotary coring using T6116 core barrel and water flush to 19.3m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PW

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH2
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	05-03-13 11-03-13			
Engineer		Client		Sheet
		Wolf Minerals (UK) Ltd		1 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
1.60	71 (0) 0	NI 30 50			(0.80)	1.60 - 3.00 Non-intact		Weak, grey and medium brown, highly weathered, SLATE. Recovered as slightly clayey gravel. (UPPER DEVONIAN SLATE).		
2.40					2.40					
	100 (30) 0	NI 50 90				3.35 - 3.40 Non-intact 3.60 - 3.85 Non-intact 3.60 - 3.90 Highly weathered very weak zone		Weak locally medium strong, medium grey and light brown, moderately weathered, SLATE with occasional 10-40mm quartz veins. Some original laminations still visible along with beginnings of foliated texture in parts. Alteration to red brown and cream between 7.0 and 9.3m. (UPPER DEVONIAN SLATE).		
3.90						3.90 - 3.95 Non-intact 4.25 8mm mica rich quartz vein				
	93 (87) 29	NI 70 150				4.80 10mm mica rich quartz vein 5.40 - 5.45 Non-intact		Fractures closely to medium spaced, locally very closely spaced, stepped rough to planar smooth, generally sub-horizontal (0-10°) and steeply dipping (45-60°), some discoloration of fracture surfaces but no infill.		
6.10										
	100 (88) 55	NI 100 360				6.50 - 6.65 Non-intact 8.10 - 8.20 Non-intact 8.55 - 8.60 Non-intact				
9.00					(13.10)	8.80 - 8.85 Non-intact				

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
05-03-13	17.00	8.00	1.60	92mm		

Rotary Flush

From	To	Type	Returns
1.6	50.0	Air mist	

General Comments

Borehole open holed to 1.6m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH2
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	05-03-13 11-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			2 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
	80 (60) 31	NI 50 470				9.80 - 10.05 Non-intact 10.00 - 10.20 Highly weathered very weak zone		Weak locally medium strong, medium grey and light brown, moderately weathered, SLATE with occasional 10-40mm quartz veins. Some original laminations still visible along with beginnings of foliated texture in parts. Alteration to red brown and cream between 7.0 and 9.3m. (UPPER DEVONIAN SLATE). Fractures closely to medium spaced, locally very closely spaced, stepped rough to planar smooth, generally sub-horizontal (0-10°) and steeply dipping (45-60°), some discoloration of fracture surfaces but no infill. *(continued)*		
10.50						10.50 - 10.75 Non-intact				
	93 (53) 41	NI 80 260				11.15 - 11.20 Non-intact 11.70 - 12.35 Non-intact				
12.00										
	93 (42) 52	NI 70 270				12.40 - 13.10 Non-intact 12.60 40mm quartz vein 12.90 80mm quartz vein 13.88 - 13.90 Non-intact 14.20 - 15.20 Non-intact				
15.00										
					15.50					
	100 (87) 59	NI 120 350				15.70 - 15.80 Non-intact 15.90 - 15.95 Non-intact 17.20 50mm quartz vein				

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

General Comments

Borehole open holed to 1.6m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				**BH2**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	05-03-13 11-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			3 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
17.80						17.70 - 17.80 Non-intact		Weak to medium strong, dark grey, purple and light brown, slightly to moderately weathered SLATE with frequent quartz veins. Locally altered to pale cream colour. Some original laminations still visible along with beginnings of foliated texture in parts. (UPPER DEVONIAN SLATE). Fractures closely to medium spaced, locally very closely spaced, stepped rough, undulating smooth and planar rough, generally sub-horizontal (0-5°) and steeply dipping (45-65°), some discoloration of fracture surfaces but no infill. *(continued)*		
	96 (90) 51	NI 110 330								
20.90						20.80 - 21.00 Non-intact				
	94 (89) 54	NI 110 240								
22.70						22.60 - 22.80 Highly weathered zone, altered to yellowish grey clay				
	90 (83) 59	NI 130 390				24.10 - 24.20 Non-intact 24.75 50mm quartz vein				

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
06-03-13	17.00	19.00	1.60	92mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 1.6m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				**BH2**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	05-03-13 11-03-13			
Engineer		Client		Sheet
		Wolf Minerals (UK) Ltd		4 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology / Instrument/ Backfill
~~25.70~~								Weak to medium strong, dark grey, purple and light brown, slightly to moderately weathered SLATE with frequent quartz veins. Locally altered to pale cream colour. Some original laminations still visible along with beginnings of foliated texture in parts. (UPPER DEVONIAN SLATE). Fractures closely to medium spaced, locally very closely spaced, stepped rough, undulating smooth and planar rough, generally sub-horizontal (0-5°) and steeply dipping (45-65°), some discoloration of fracture surfaces but no infill. *(continued)*	
	100 (93) 60	NI 140 250							
28.00						27.80 - 28.20 Quartz vein 28.00 - 28.10 Non-intact			
	100 (95) 83	NI 150 450							
30.00						30.00 - 30.10 Non-intact 30.33 - 30.83 Non-intact			
	100 (90) 75	NI 21 480			(34.50)				
33.00						32.90 - 33.80 Non-intact 33.40 - 33.45 Non-intact			

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
07-03-13	17.00	30.00	1.60	92mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 1.6m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH2
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	05-03-13 11-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			5 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
	100 (94) 66	NI 130 300						Weak to medium strong, dark grey, purple and light brown, slightly to moderately weathered SLATE with frequent quartz veins. Locally altered to pale cream colour. Some original laminations still visible along with beginnings of foliated texture in parts. (UPPER DEVONIAN SLATE). Fractures closely to medium spaced, locally very closely spaced, stepped rough, undulating smooth and planar rough, generally sub-horizontal (0-5°) and steeply dipping (45-65°), some discoloration of fracture surfaces but no infill. *(continued)*		
35.60						35.50 - 35.60 Non-intact 35.75 - 35.80 Non-intact				
	95 (86) 54	NI 130 300				36.85 - 36.95 Mica rich quartz vein 37.10 - 37.15 Non-intact				
38.40						38.30 - 38.40 Non-intact				
	91 (87) 56	NI 160 400				39.80 - 40.30 Non-intact 40.20 - 40.30 Non-intact				
40.70										
	100	NI								

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

General Comments

Borehole open holed to 1.6m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

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RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				**BH2**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	05-03-13 11-03-13			
Engineer		Client		Sheet
		Wolf Minerals (UK) Ltd		6 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
	(78) 75	200 450						Weak to medium strong, dark grey, purple and light brown, slightly to moderately weathered SLATE with frequent quartz veins. Locally altered to pale cream colour. Some original laminations still visible along with beginnings of foliated texture in parts. (UPPER DEVONIAN SLATE). Fractures closely to medium spaced, locally very closely spaced, stepped rough, undulating smooth and planar rough, generally sub-horizontal (0-5°) and steeply dipping (45-65°), some discoloration of fracture surfaces but no infill. *(continued)*		
42.70						42.50 - 42.70				
	86 (78) 43	NI 80 230								
44.00						43.80 - 43.90				
	85 (79) 66	NI 160 410				45.20 - 45.30 45.70 - 45.80				
47.00										
						47.10 - 47.40 Non-intact				
	100 (76) 48	NI 95 310				48.50 - 48.60				

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
08-03-13	17.00	42.70	1.60	92mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 1.6m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

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RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				**BH2**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	05-03-13 11-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			7 of 7

RUN DETAILS			STRATA							
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
50.00					50.00	49.55 - 49.60 49.60 60mm quartz vein 49.80 - 50.00 Non-intact				

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
11-03-13	17.00	50.00	1.60	92mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 1.6m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

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RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				**BH3**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	26-03-13 05-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			1 of 4

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
7.80	61 (0) 0	NI 15 70				7.80 - 14.90 Non-intact		Very weak to weak, red brown with localised black staining, highly weathered, SLATE. Generally recovered as clayey gravel (partially due to drilling disturbance). Locally completely weathered to firm clay. (UPPER DEVONIAN SLATE).		
9.30										
	19 (0) 0	NI 15 30								
10.50										
	51 (0) 0	NI 10 50			(7.50)	11.25 - 11.35 Highly weathered zone, altered to firm to stiff gravely clay. 11.70 - 12.00 Highly weathered zone, altered to firm to stiff gravely clay.				
12.00										
	66 (0) 0	NI 10 60								
13.50										
	90 (4) 0	NI 10 60								
14.70										
	100 (24) 0	NI 40 70			15.30	15.05 - 15.30 Non-intact 15.40 - 15.60 Non-intact				
15.60										

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
26-02-13	17.00	11.00	7.80	92mm		

Rotary Flush			
From	To	Type	Returns
7.8	39.0	Water	

General Comments

Borehole open holed to 7.8m. Hole then continued by rotary coring using T6116 core barrel and water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH3
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	26-03-13 05-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			2 of 4

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology / Instrument/ Backfill
	96 (68) 20	NI 60 100				15.85 - 15.88 Non-intact 16.17 - 16.22 Non-intact 16.30 - 16.37 Non-intact 16.48 - 16.60 Non-intact		Very weak to weak, red brown with localised black staining, moderately weathered, SLATE. Some steeply dipping original laminations visible. Locally highly weathered and altered to extremely weak mudstone/hard clay. (UPPER DEVONIAN SLATE).	
16.90					(2.90)	16.80 - 19.85 Non-intact			
	100 (0) 0	NI 10 40						Fractures generally closely locally very closely spaced, dipping 5° to 70°, stepped and undulating rough, and undulating smooth, discoloration and iron staining of fracture surfaces but no infill. *(continued)*	
18.20					18.20				
	100 (0) 0	NI 10 40						Extremely weak to very weak, red brown with localised black staining, highly weathered, SLATE. Some steeply dipping original laminations visible. Locally completely weathered to stiff gravelly clay. (UPPER DEVONIAN SLATE).	
19.10					(1.25)				
					19.45			Fractures largely obscured by weathering state, although generally extremely closely to closely spaced. Weak locally extremely to very weak, red brown locally pale grey, moderately weathered, SLATE. Little visible original structure visible.	
	52 (8.5) 0	NI 10 45							
21.10						21.00 - 21.40 Non-intact 21.20 - 21.30 Highly weathered zone, altered to firm to stiff gravely clay.		Fractures very closely to closely spaced, stepped rough to planar smooth, dipping at 5° to 75°, discoloration and iron staining on many fracture surfaces but no infill. (UPPER DEVONIAN SLATE).	
	92 (14) 12	NI 60 140				21.85 - 23.70 Non-intact			
22.40									
	86 (0) 0	NI 10 60				22.70 - 23.00 Highly weathered zone, altered to firm to stiff gravely clay.			
23.00									
	87	NI							

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
27-02-13	17.00	19.50	7.80	92mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 7.8m. Hole then continued by rotary coring using T6116 core barrel and water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH3
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	26-03-13 05-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			3 of 4

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
	(18) 6	30 100						Weak locally extremely to very weak, red brown locally pale grey, moderately weathered, SLATE. Little visible original structure visible.		
24.60						24.60 - 24.70 Non-intact		Fractures very closely to closely spaced, stepped rough to planar smooth, dipping at 5° to 75°, discoloration and iron staining on many fracture surfaces but no infill. (UPPER DEVONIAN SLATE). *(continued)*		
	93 (20) 6	NI 40 100				24.90 - 25.35 Non-intact				
26.20						26.05 - 26.14 Non-intact 26.20 - 26.25 Non-intact 26.35 - 26.45 Non-intact 26.50 - 26.55 Non-intact				
	88 (21) 0	NI 40 80				27.40 - 27.90 Non-intact				
27.80						27.70 - 27.20 Non-intact 28.00 - 28.20 Non-intact				
	88 (53) 14	NI 60 120				28.60 - 29.00 Non-intact 28.70 30mm quartz vein				
29.30					(19.55)					
	90 (43) 0	NI 40 90				29.30 - 29.40 Non-intact 29.50 - 29.65 Non-intact				
29.90						29.80 - 29.90 Highly weathered zone, altered to firm to stiff gravely clay.				
	100 (48) 34	NI 60 120								
31.10										
	54	NI								

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
28-02-13	17.00	25.50	7.80	92mm		
01-03-13	17.00	31.30	15.30	92mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 7.8m. Hole then continued by rotary coring using T6116 core barrel and water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH3
Job No: RP5534	Date: 26-03-13 05-03-13	Ground Level (m):	Co-Ordinates ():	
Engineer:	Client: Wolf Minerals (UK) Ltd			Sheet: 4 of 4

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology / Instrument/ Backfill
	(41) 0	40 80				31.90 - 32.60 Non-intact		Weak locally extremely to very weak, red brown locally pale grey, moderately weathered, SLATE. Little visible original structure visible.	
32.50									
	100 (33) 18	NI 50 110				32.80 - 33.10 Non-intact		Fractures very closely to closely spaced, stepped rough to planar smooth, dipping at 5° to 75°, discoloration and iron staining on many fracture surfaces but no infill. (UPPER DEVONIAN SLATE). *(continued)*	
33.10									
	59 (28) 0	NI 50 80				33.50 - 34.20 Non-intact			
34.00									
	80 (48) 31	NI 80 110				34.35 - 34.45 Non-intact 34.80 50mm quartz vein 35.20 - 36.80 Non-intact			
35.50									
	0 (0) 0								
36.00									
	40 (0) 0	NI 10 40							
36.50									
	75 (24) 10	NI 24 75				36.50 - 37.30 Much black mineralisation (possibly manganesse) 37.10 - 37.30 Highly weathered zone, altered to firm pale grey and yellow clay.			
37.50									
	93 (47) 25	NI 70 140				37.50 - 37.90 Non-intact 38.25 - 38.35 Non-intact 38.70 - 38.85 Non-intact			
39.00					39.00				

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
02-03-13	17.00	36.50	15.30	92mm		
03-03-13	17.00	39.00	15.30	92mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 7.8m. Hole then continued by rotary coring using T6116 core barrel and water flush.

All dimensions in metres Scale 1:50	Contractor: Ground Search	Method/ Plant Used: Beretta T44	Logged By: PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH3A
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	12-03-13 19-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			1 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
1.70	50 (0) 0	NI				1.70 - 2.90 Non-intact		Weak to medium strong, grey green and red brown, highly weathered, SLATE. Generally recovered as clayey gravel. Locally completely weathered to soft to firm grey clay. (UPPER DEVONIAN SLATE).		
2.10					(1.20)					
	55 (9) 0	NI 10 60			2.90					
3.30						3.00 - 3.20 Non-intact 3.30 - 3.40 Non-intact		Medium strong, grey green locally red brown, moderately weathered SLATE with occasional 5-30mm quartz veins. Some original laminations still visible along with beginnings of foliated texture in parts. (UPPER DEVONIAN SLATE) Fractures are very closely to closely, locally extremely closely spaced, stepped rough and planar rough, generally sub-horizontal (5-10°) and steeply dipping (45-80°), some discoloration of fracture surfaces but no infill. .		
	100 (75) 0	NI 50 70								
3.90										
	100 (38) 9	NI 50 120				4.60 - 4.90 Non-intact 5.00 - 5.55 Non-intact				
5.20										
	100 (69) 37	NI 70 200				5.35 - 5.55 Highly weathered zone, altered to firm grey clay with much mica 6.05 - 6.15 Non-intact				
6.60										
	100 (32) 25	NI 70 110				6.70 - 6.80 Non-intact 7.40 - 7.45 Non-intact 7.65 - 7.85 Non-intact				
8.00										
	97 (60) 17	NI 50 140				7.90 5mm mica rich vein 7.95 - 8.00 Non-intact 8.10 - 8.60 Non-intact 8.15 80mm quatz vein 8.30 - 8.60 Highly weathered very weak red brown zone. 8.75 - 8.80 Non-intact				
9.30										
						9.50 - 9.65 Non-intact				

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
12-03-13	17.00	9.40	1.70	92mm		

Rotary Flush

From	To	Type	Returns
1.7	50.5	Air mist	

General Comments

Borehole open holed to 1.7m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH3A
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	12-03-13 19-03-13			
Engineer		Client		Sheet
		Wolf Minerals (UK) Ltd		2 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
	100 (42) 16	NI 50 120				10.30 - 10.90 Non-intact		Medium strong, grey green locally red brown, moderately weathered SLATE with occasional 5-30mm quartz veins. Some original laminations still visible along with beginnings of foliated texture in parts. (UPPER DEVONIAN SLATE)		
10.90						11.00 - 11.10 Non-intact				
	100 (92) 58	NI 110 250			(17.10)			Fractures are very closely to closely, locally extremely closely spaced, stepped rough and planar rough, generally sub-horizontal (5-10°) and steeply dipping (45-80°), some discoloration of fracture surfaces but no infill. . *(continued)*		
12.30						11.95 - 12.15 Non-intact				
						12.50 - 12.70 Non-intact				
	97 (77) 47	NI 90 260				12.85 - 12.95 Non-intact				
13.80										
	98 (88) 64	NI 130 250								
15.20						15.02 - 15.30 Highly weathered zone, altered to firm grey clay				
	100 (86) 71	NI 120 230								
16.60										
	50 (0)	NI 25				16.50 - 17.00 Non-intact				
16.90	0	80								
	86 (47)	NI 40				17.15 - 17.25 Non-intact				
						17.55 - 17.65 Non-intact				

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

General Comments

Borehole open holed to 1.7m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH3A
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	12-03-13 19-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			3 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities / Detail	DESCRIPTION: Main	Geology	Instrument/ Backfill
	13	130				17.75 - 17.80 Non-intact 17.90 - 17.95 Non-intact			
18.10						18.10 - 18.30 Non-intact			
	100 (60) 38	NI 70 260				18.85 30mm mica rich quatz vein 18.95 - 19.05 Non-intact			
19.50						19.20 - 19.50 Non-intact			
	100 (10) 0	NI 40 90				19.60 - 20.55 Non-intact 19.70 - 20.00 Highly weathered weak zone			
20.40					20.00 (0.65)		Weak, grey green moderately weathered, very fine grained METABASITE. Locally highly weathered with alteration to firm gravelly clay. (METABASIC INTRUSION)		
	100 (75) 0	NI 50 80			20.65	20.40 - 20.50 Highly weathered zone, altered to firm grey clay	Fractures are very closely to closely spaced. .		
22.20						21.40 - 21.70 Non-intact	Medium strong to strong, grey green slightly weathered, very fine grained METABASITE.		
	100 (73) 21	NI 70 130			(3.95)	22.00 - 22.55 Non-intact	Locally moderately to highly weathered, pale green and red and very weak to weak. Occasional pale green grey 5-10mm feldspar rich veins, often altered to clay. Rare quartz veins. (METABASIC INTRUSION).		
24.10						23.20 - 23.40 Highly weathered pale green and red altered zone 23.50 - 23.62 Quartz vein 23.80 - 23.95 Non-intact 23.80 - 24.10 Highly weathered pale green very weak zone	Fractures are closely, locally very closely spaced, stepped and undulating rough and planar smooth, dipping at 25° to 60°, some discoloration of fracture surfaces but no infill.		
	100 (87) 69	NI 120 350			24.60				

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
13-03-13	17.00	19.50	1.70	92mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 1.7m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH3A
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	12-03-13 19-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			4 of 7

RUN DETAILS			STRATA							
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
26.80								Strong to very strong, blue grey, slightly weathered to fresh, very fine grained METABASITE. Occasional pale green grey 5-10mm feldspar rich veins. Rare quartz veins. Evidence of 'greisen' type alteration around the intruded veins. (METABASIC INTRUSION). Fractures are closely to medium, locally very closely spaced, undulating and planar smooth, and occasionally planar smooth, dipping at 15° to 60°, some discoloration of fracture surfaces but no infill. *(continued)*		
29.20	100 (100) 57	30 120 300			(6.40)					
30.00	100 (81) 46	NI 70 270				29.20 - 29.30 Non-intact 29.40 - 29.45 Non-intact				
32.00	95 (43) 22	NI 50 400			31.00	30.50 - 30.60 Non-intact 31.05 - 31.75 Non-intact		Weak to medium strong, dark and light green slightly to moderately weathered, very fine grained METABASITE. Occasional pale green grey 5-10mm feldspar rich veins, often altered to clay and iron stained. Rare quartz veins. Evidence of 'greisen' type alteration around the intruded veins. (METABASIC INTRUSION). Fractures are very closely to closely spaced, locally very closely and medium spaced, stepped and undulating rough, occasionally planar rough, dipping at 5° to 70°, some discoloration of fracture surfaces but no infill.		
	90 (56) 18	NI 60 200				31.85 - 32.30 Non-intact 32.60 - 32.70 Non-intact				

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
14-03-13	17.00	29.60	1.70	92mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 1.7m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH3A
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	12-03-13 19-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			5 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
34.50					(6.30)	34.00 - 34.50 Non-intact		Weak to medium strong, dark and light green slightly to moderately weathered, very fine grained METABASITE. Occasional pale green grey 5-10mm feldspar rich veins, often altered to clay and iron stained. Rare quartz veins. Evidence of 'greisen' type alteration around the intruded veins. (METABASIC INTRUSION).		
37.30	93 (80) 52	NI 110 300			37.30	35.10 - 35.15 Non-intact 36.10 - 36.20 Non-intact 36.98 - 37.10 Non-intact		Fractures are very closely to closely spaced, locally very closely and medium spaced, stepped and undulating rough, occasionally planar rough, dipping at 5° to 70°, some discoloration of fracture surfaces but no infill. *(continued)*		
38.70	100 (69) 25	NI 60 230				37.60 - 37.80 Non-intact 38.20 - 38.30 Highly weathered zone, altered to clay 38.20 - 38.45 Non-intact		Medium strong to strong locally very strong, dark grey and medium, slightly locally moderately weathered, SLATE. Black with much possible tourmalinization between 38.7 and 40.0m. occasional quartz veins. No original structure visible. (UPPER DEVONIAN SLATE).		
40.00	100 (100) 62	40 120 240			(4.25)			Fractures are very closely to medium spaced, stepped and undulating rough, dipping at 5° to 70, some discoloration of fracture surfaces but no infill.		
40.50	70 (24) 24	NI 60 120				40.00 - 40.10 Non-intact 40.25 - 40.50 Non-intact				
	100 (80)	NI 120			41.55					

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
15-03-13	17.00	37.30	15.00	92mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 1.7m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

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RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH3A
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	12-03-13 19-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			6 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
	61	350				41.90 - 42.30 Highly weathered zone, altered to clayey gravel		Weak to medium strong locally strong, dark grey and medium brown, slightly locally moderately weathered, SLATE. Occasional quartz veins. Very little original structure visible. (UPPER DEVONIAN SLATE). Fractures are closely to medium spaced locally very closely, stepped and undulating rough, dipping at 5° to 60, some discoloration of fracture surfaces but no infill. *(continued)*		
42.50						42.70 - 42.80 Quatz vien.				
	100 (72) 37	NI 70 300				43.50 - 43.85 Non-intact				
45.00						44.60 - 44.90 Non-intact				
						45.50 - 45.55 Non-intact				
					(8.95)					
	100 (63) 32	NI 60 150				46.15 - 46.25 Non-intact				
47.70						46.55 - 46.75 Highly weathered extremely weak zone				
						47.70 - 47.80 Non-intact				
	100 (96) 80	NI 150 450								

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
18-03-13	17.00	47.70	15.00	92mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 1.7m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

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RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH3A
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	12-03-13 19-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			7 of 7

RUN DETAILS			STRATA							
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
50.50					50.50			Weak to medium strong locally strong, dark grey and medium brown, slightly locally moderately weathered, SLATE. Occasional quartz veins. Very little original structure visible. (UPPER DEVONIAN SLATE). Fractures are closely to medium spaced locally very closely, stepped and undulating rough, dipping at 5° to 60, some discoloration of fracture surfaces but no infill. *(continued)*		

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
19-03-13	17.00	50.50	15.00	92mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 1.7m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

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RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH4
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	13-03-13 19-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			1 of 6

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
3.30	87 (0) 0				(1.50)			Extremely weak light brown and dark grey highly weathered SLATE. Generally altered to very stiff laminated clay. (UPPER DEVONIAN SLATE).		
4.80					4.80	4.70 - 6.80 Generally non-intact				
6.30	73 (13) 8	NI 40 120						Weak, dark grey and cream, moderately locally highly weathered, SLATE with rare quartz veins. Locally altered to very stiff gravelly clay. (UPPER DEVONIAN SLATE). Fractures are closely locally very closely spaced, undulating rough and planar smooth, dipping at 5° to 80°, with no infill.		
7.90	100 (60) 7	NI 60 110				7.10 - 7.20 Non-intact 7.30 - 7.50 Non-intact 7.75 - 7.90 Non-intact				
9.40	69 (9) 0	NI 9 69			(7.00)	8.00 - 9.15 Non-intact				
11.00	100 (21) 0	NI 21 100				9.50 - 9.70 Non-intact 9.90 - 10.00 Non-intact				

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
13-03-13	17.00	3.30	3.30	92mm		
14-03-13	17.00	9.40	3.30	92mm		

Rotary Flush

From	To	Type	Returns
3.3		water	

General Comments

Borehole open holed to 3.3m. Hole continued by rotary coring using T6116 core barrel and water flush to 12.5m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PW

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RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH4
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	13-03-13 19-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			2 of 6

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities / Detail	DESCRIPTION Main	Geology	Instrument/ Backfill
	87 (49) 0	NI 49 87			11.80	11.20 - 11.70 Altered to stiff clay			
12.30							Weak to medium strong, dark grey, slightly weathered, SLATE with rare quartz, mica and altered feldspar veins. Some original laminations still visible. (UPPER DEVONIAN SLATE). Fractures are very closely to medium spaced, generally closely spaced, stepped rough to undulating smooth, dipping at 5° to 70°, with clay smears on some fractures surfaces.		
	96 (79) 30	NI 80 160							
13.70									
	90 (78) 30	NI 80 210			(7.20)	14.50 - 14.58 Non-intact 14.70 - 15.10 Non-intact 16.05 - 16.15 Non-intact 16.35 - 16.50 Non-intact			
16.80									
	98 (98) 55	30 110 220							
19.00					19.00				
						19.00 - 19.20 Non-intact			

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
15-03-13	17.00	19.00	3.30	47.6mm		

Rotary Flush			
From	To	Type	Returns

General Comments

Borehole open holed to 3.3m. Hole continued by rotary coring using T6116 core barrel and water flush to 12.5m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PW

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH4
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	13-03-13 19-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			3 of 6

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
	96 (73) 15	NI 70 110				20.40 - 20.40 Non-intact 20.50 - 20.60 Non-intact		Weak locally very weak, dark grey cream and light brown, moderately weathered SLATE with rare quartz and mica veins. Some original laminations still visible. (UPPER DEVONIAN SLATE). Fractures are very closely to medium spaced, stepped rough to undulating smooth, dipping at 5° to 60°, with no infill. *(continued)*		
21.30						21.20 - 21.35 Non-intact				
	100 (90) 54	NI 110 400				22.45 - 22.50 Non-intact 22.80 - 22.90 Non-intact				
24.40										
	100 (88) 60	NI 120 280				26.80 - 27.10 Non-intact				

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
16-03-13	17.00	24.40	3.30	47.6mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 3.3m. Hole continued by rotary coring using T6116 core barrel and water flush to 12.5m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PW

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RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				**BH4**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	13-03-13 19-03-13			
Engineer		Client		Sheet
		Wolf Minerals (UK) Ltd		4 of 6

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
27.50						27.20 - 27.25 Non-intact 27.50 - 27.60 Non-intact		Weak locally very weak, dark grey cream and light brown, moderately weathered SLATE with rare quartz and mica veins. Some original laminations still visible. (UPPER DEVONIAN SLATE). Fractures are very closely to medium spaced, stepped rough to undulating smooth, dipping at 5° to 60°, with no infill. *(continued)*		
	100 (83) 31	NI 70 190			(17.80)	27.95 - 27.15 Non-intact				
30.50						30.25 - 30.30 Non-intact 30.40 - 30.50 Non-intact				
	88 (88) 47	50 90 320								
31.40						31.45 - 31.50 Non-intact 31.70 - 31.75 Non-intact 31.95 - 32.25 Non-intact				
	100 (85) 53	NI 120 410				33.05 - 33.10 Non-intact				
34.50										
	100 (62) 37	NI 50 180				34.90 - 35.00 Non-intact 35.10 - 35.30 Non-intact				

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
18-03-13	17.00	34.50	3.30	47.6mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 3.3m. Hole continued by rotary coring using T6116 core barrel and water flush to 12.5m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH4
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	13-03-13 19-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			5 of 6

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology / Instrument/ Backfill
35.40								Weak locally very weak, dark grey cream and light brown, moderately weathered SLATE with rare quartz and mica veins. Some original laminations still visible. (UPPER DEVONIAN SLATE). Fractures are very closely to medium spaced, stepped rough to undulating smooth, dipping at 5° to 60°, with no infill. *(continued)*	
	100 (79) 76	NI 130 360			36.80			Weak locally very weak, greyish light brown and red brown, slightly locally moderately weather, SLATE, with occasional quartz and felspar rich veins. (UPPER DEVONIAN SLATE). Fractures are very closely to medium spaced, stepped rough to undulating smooth, dipping at 5° to 60°, with no infill.	
						37.60 - 37.70 Non-intact			
38.50						38.25 - 38.50 Non-intact			
	100 (97) 72	NI 120 250			(6.70)	39.75 - 39.80 Non-intact 40.25 - 40.35 Non-intact			
41.50									
	74 (70) 30	NI 80 170				42.50 - 42.50 Non-intact			

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 3.3m. Hole continued by rotary coring using T6116 core barrel and water flush to 12.5m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH4
Job No: RP5534	Date: 13-03-13 19-03-13	Ground Level (m):	Co-Ordinates ():	
Engineer:	Client: Wolf Minerals (UK) Ltd			Sheet: 6 of 6

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology / Instrument/ Backfill
43.50					43.50	43.20 - 43.30 Non-intact			
	100 (88) 59	NI 120 460				44.40 - 44.30 Non-intact		Medium strong dark grey slightly weathered to fresh SLATE with frequent quartz and mica veins. Some lamination still visible. (UPPER DEVONIAN SLATE). Fractures closely to medium spaced, undulating rough and smooth with clay smears on some fracture surfaces.	
46.60						45.95 - 46.10 Non-intact			
	100 (95) 78	NI 95 100			(7.20)	47.10 - 47.25 Non-intact			
49.70									
	100 (95) 62	NI 95 100							
50.70					50.70	50.55 - 50.60 Non-intact			

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
19-03-13	17.00	50.70	3.30	47.6mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 3.3m. Hole continued by rotary coring using T6116 core barrel and water flush to 12.5m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor: Ground Search	Method/ Plant Used: Beretta T44	Logged By: PW

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH5
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	26-03-13 04-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			1 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	DESCRIPTION: Main	Geology / Instrument/ Backfill
1.60	90 (53) 23	NI 60 180			(0.65)	1.60 - 1.70 Non-intact 1.75 - 1.85 Non-intact 1.80 - 2.05 Remains of quartz vein on 80° fracture		Weak to medium strong, grey slightly weathered, SLATE. (UPPER DEVONIAN SLATE).	
2.40					2.25	2.10 - 2.25 Non-intact		Fractures very close to closely spaced, stepped rough dipping 5°.	
	100 (82) 55	NI 90 290			(2.15)			Weak to medium strength, dark grey with red and orange stains on fracture surface, slightly weathered SLATE. (UPPER DEVONIAN SLATE). Fractures generally closely to medium spaced stepped rough, occasionally planar smooth, occasional quartz veining 45°-90°.	
4.40					4.40	4.05 - 4.15 Quartz vein 4.35 - 4.45 Quartz vein			
	98 (76) 76	NI 90 360				5.30 - 5.40 Non-intact 6.40 - 7.10 Non-intact		Weak to medium strong, dark grey, slightly weathered, SLATE. (UPPER DEVONIAN SLATE). Some structure visible dipping 40-55°. (UPPER DEVONIAN SLATE). fractures closely to very closely spaced, planar smooth dipping 40° with slight iron staining around fracture. Second set of fractures 82° with associated quartz veining stepped rough. Some clay infill on steeply dipping fractures.	
7.40					(5.90)				
	100 (98) 61	NI 120 310				8.45 - 8.50 Non-intact			

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
26-02-13	17.00	1.60	1.60	92mm		

Rotary Flush

From	To	Type	Returns
1.6	50.2	Air mist	

General Comments

Borehole open holed to 1.6m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

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RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH5
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	26-03-13 04-03-13			
Engineer		Client		Sheet
		Wolf Minerals (UK) Ltd		2 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
10.30					10.30					
	97 (94) 50	NI 70 270				10.35 - 10.40 Non-intact 11.55 - 11.57 Quartz vein 12.05 - 12.10 Non-intact		Weak to medium strong dark greenish grey slightly weathered SLATE with occasional quartz veins. Fractures very close to medium spaced, stepped rough to planar smooth dipping 0°-55° predominantly 25°-35°, iron staining along multiple fracture surfaces.		
13.40										
	100 (97) 93	NI 150 460				13.58 - 13.63 Non-intact 14.23 - 14.29 Non-intact				
16.40					(11.90)	16.20 - 16.40 Granite vein 10mm thick dipping 80° 16.85 - 16.90 Non-intact 17.30 - 17.32 Quartz vein				

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
27-02-13	17.00	16.40	1.60	92mm		

Rotary Flush			
From	To	Type	Returns

General Comments

Borehole open holed to 1.6m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH5
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	26-03-13 04-03-13			
Engineer		Client		Sheet
		Wolf Minerals (UK) Ltd		3 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
	95 (91) 58	NI 120 450				17.50 - 17.55 Quartz vein		Weak to medium strong dark greenish grey slightly weathered SLATE with occasional quartz veins. Fractures very close to medium spaced, stepped rough to planar smooth dipping 0°-55° predominantly 25°-35°, iron staining along multiple fracture surfaces. *(continued)*		
19.40										
	100 (98) 88	NI 120 550				19.65 - 19.70 Non-intact				
22.20					22.20					
	100 (95) 94	NI 80 400				23.00 - 23.12 Non-intact		Weak to medium strong dark grey slightly weathered SLATE with occasional quartz veins. Some structure visible dipping 80°. Localised areas with red staining. (UPPER DEVONIAN SLATE). Fractures very close to medium spaced, stepped rough to planar smooth dipping 0°- 80° predominantly 25°-35°, iron staining along multiple fracture surfaces, rare clay infill.		
24.60										
	100 (93) 55	NI 50 150				24.60 - 24.66 Quartz vein dip 60° 24.85 - 24.90 Non-intact				
25.20						25.20 - 25.40 Non-intact				

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

General Comments

Borehole open holed to 1.6m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH5
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	26-03-13 04-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			4 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION		Geology	Instrument/ Backfill
						Discontinuities	Detail / Main		
	100 (88) 58	NI 110 240			(8.90)	25.64 - 25.78 Non-intact 25.95 - 25.97 10mm Quartz vein with 3mm clay either side 26.03 - 26.10 Non-intact 26.80 - 26.82 Quartz vein	Weak to medium strong dark grey slightly weathered SLATE with occasional quartz veins. Some structure visible dipping 80°. Localised areas with red staining. (UPPER DEVONIAN SLATE). Fractures very close to medium spaced, stepped rough to planar smooth dipping 0°- 80° predominantly 25°-35°, iron staining along multiple fracture surfaces, rare clay infill. *(continued)*		
28.10									
28.50	100 (76) 76	NI 110 210				28.30 - 28.42 Non-intact			
	100 (94) 74	NI 80 390				29.70 - 29.71 Granite vein dip 80° 29.70 - 29.80 Non-intact 30.30 - 30.33 Non-intact			
30.60									
					31.10	31.10 - 31.20 Heavy iron staining	Weak to medium strong dark grey slightly weathered SLATE with frequent quartz veins. (UPPER DEVONIAN SLATE). Fractures very close to medium spaced, stepped rough to planar smooth dipping 0°-55° predominantly 25°-35°, iron staining along multiple fracture surfaces.		
	100 (98) 84	NI 150 300			(2.50)				
33.60					33.60				

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
28-02-13	17.00	28.50	1.60	92mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 1.6m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH5
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	26-03-13 04-03-13			
Engineer		Client		Sheet
		Wolf Minerals (UK) Ltd		5 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
	100 (78) 60	NI 100 210				33.66 - 33.73 Non-intact		Weak to medium strong dark grey slightly weathered SLATE, with occasional quartz veins. Occasional areas of red staining. Some quartz veins are rich in mica. (UPPER DEVONIAN SLATE). Fractures very closely to closely spaced dipping at 20° and 70-80° planar rough and stepped smooth, steeply dipping fractures often associated with veining. Abundant iron staining on multiple fracture surfaces and clay infilling along occasional joints.		
34.60						34.50 - 34.65 Non-intact				
	100 (93) 86	NI 90 190				34.85 - 34.95 Non-intact				
36.50						35.55 - 35.60 Non-intact				
	100 (95) 62	NI 150 300			(10.00)	36.60 - 36.80 Clayey infill of stepped fracture				
39.50						37.50 - 37.60 Non-intact				
	100 (96) 84	NI 120 320				38.10 - 38.20 Non-intact				
40.50						40.30 - 40.33 Non-intact				
	100 (99)									

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
01-03-13	17.00	40.50	1.60	92mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 1.6m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH5
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	26-03-13 04-03-13			
Engineer		Client		Sheet
		Wolf Minerals (UK) Ltd		6 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
	58									
42.50						42.40 - 42.42 Non-intact 42.50 - 43.60 Fracture Index 18				
	100 (98) 41	NI 80 290								
43.20					43.60	43.50 - 43.52 Quartz vein				
						43.60 - 44.05 Non-intact highly weathered zone		Weak to medium strong, dark grey and pale grey green, moderately weathered SLATE with occasional quartz veins. (UPPER DEVONIAN SLATE). Fractures very closely to closely spaced dipping at 20° and 70-80° planar rough and stepped smooth. Abundant iron staining on multiple fracture surfaces and clay infilling along occasional joints.		
	100 (50) 15	NI 50 160				44.20 - 44.50 Non-intact				
45.20						45.05 - 45.20 Non-intact soft with clay smears				
	98 (75) 36	NI 50 200			(4.60)	45.91 - 45.95 Non-intact 46.00 - 46.02 Clay filled fracture				
47.20						46.85 - 47.20 Non-intact				
	92 (90) 26	NI 70 150				47.20 - 47.25 Non-intact				
48.20					48.20	48.00 - 48.05 Quartz vein				
						48.40 - 48.50 Quartz vein				
	100 (93) 59	NI 110 350			(2.00)	48.90 - 49.10 Quartz vein 49.20 - 49.30 Quartz vein 49.45 - 49.55 Quartz vein				

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

General Comments

Borehole open holed to 1.6m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH5
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	26-03-13 04-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			7 of 7

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
50.20					50.20	49.70 - 49.80 Quartz vein 50.14 - 50.20 Non-intact		Weak to medium strong, dark grey slightly weathered SLATE with occasional quartz veins. (UPPER DEVONIAN SLATE). Fractures very closely to closely spaced dipping at 20° and 70-80° planar rough and stepped smooth, multiple quartz veins up to 175mm thick. Abundant iron staining on multiple fracture surfaces and clay infilling along occasional joints. *(continued)*		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
04-03-13	17.00	50.20	1.60	92mm		

Rotary Flush			
From	To	Type	Returns

General Comments

Borehole open holed to 1.6m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH6
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	06-03-13 19-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			1 of 6

RUN DETAILS			STRATA							
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
2.00	60 (07) 0	NI 15 80			(1.50)	2.11 - 3.50 Non-intact		Very weak to weak, light orange and red, occassionally grey, highly weathered,SLATE. Fractures extremely closely to very closely spaced, planar rough dipping at ~45° (UPPER DEVONIAN SLATES).		
3.50					3.50					
	80 (46) 35	NI 40 130			(0.60) 4.10 (0.90)	3.50 - 4.10 Non-intact		Very weak to weak light grey with orange staining weathered SLATE. (UPPER DEVONIAN SLATE). Fractures extremely close to close planar rough, clay infilling along multiple fractures. At contact highly weathered to stiff clay. .		
5.00					5.00	4.80 - 4.90 Non-intact		Weak to medium strong, yellowish brown to light grey, moderately to slightly weathered, GRANITE. (IGNEOUS INTRUSION).		
6.10	72 (85) 09	7 30 100			(1.10) 6.10	5.05 - 5.15 Non-intact 5.35 - 5.40 Non-intact		Fractures are extremely close to very close spaced locally, dipping at predominantly 20° and 80° planar rough with weathering along fractures.		
6.50	75 (50) 6	NI 90 90						Very weak to medium strong, light grey to yellowish brown, slightly to moderately weathered GRANITE. (IGNEOUS INTRUSION).		
	97 (87) 41	NI 80 140			(2.45) 8.55	6.80 - 6.35 Non-intact		Fractures extremely close to closely spaced, planar smooth and undulating smooth, dipping 10°-50°. Weak to medium strong, light grey, locally slightly to moderately weathered GRANITE. (IGNEOUS INTRUSION). Fractures extremely close to closely spaced, planar and stepped rough, in parts weathering along fracture to clay. Contains occasional quartz vein dipping 45°.		
8.80										
9.40	83 (58) 0	NI 20 30			(0.85) 9.40			Very weak to weak, dark grey to yellowish grey, SLATE. (UPPER DEVONIAN SLATES)		
	100 (71)	NI 30			(1.00)	9.60 - 9.70 Non-intact		Fractures extremely to very closely spaced cleavage parallel, planar \smooth and rough dipping 35°.		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
06-03-13	17.00	3.50	3.50	92mm		

Rotary Flush			
From	To	Type	Returns
2	50.0	Water	

General Comments

Borehole open holed to 2.0m. Hole continued by rotary coring using T6116 core barrel and water flush to 13.2m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PH

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH6
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	06-03-13 19-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			2 of 6

RUN DETAILS			STRATA							
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
	18	180						Very weak to medium strong, greyish yellow, slightly to moderately weathered SLATE.		
10.40					10.40	10.20 - 10.40 Non-intact				
	100 (83) 0	NI 60 176						Some original laminations still visible. (UPPER DEVONIAN SLATES).		
11.40					(1.80)	11.10 - 11.20 Non-intact 11.33 - 11.40 Non-intact		Fractures extremely close to closely spaced, planar smooth and occasionally rough, cleavage parallel dipping 45° . *(continued)*		
	100 (100) 33	8 50 140						Weak to medium strong, light grey to yellowish brown, fresh to slightly weathered SLATE.		
12.20					12.20					
	100 (70) 49	NI 20 160						Laminations still visible in rock dipping 70-90° and 10mm thick quartz vein at 10.9m dipping 60°. (UPPER DEVONIAN SLATE)		
13.20						12.90 - 13.20 Non-intact				
						13.20 - 13.40 Non-intact		Fractures extremely close to very closely spaced, planar smooth predominantly dipping 35°-50° with range of 10-90°.		
						13.50 - 13.80 Non-intact				
	41 (12) 06	NI 30 190				13.90 - 15.00 Non-intact		Weak, light to dark grey, slightly weathered locally, SLATE. (UPPER DEVONIAN SLATE)		
15.00					(4.80)			Fractures extremely closely to medium spaced, cleavage parallel, planar smooth and stepped rough dipping 20-40°.		
						15.00 - 15.30 Non-intact				
	100 (57) 14	NI 25 140				15.75 - 15.90 Non-intact				
16.33						16.10 - 16.25 Non-intact				
	85 (70) 25	NI 25 140								
16.90					17.00					
				+ + + + + + + +	(0.80)	17.28 - 17.35 Non-intact 17.38 - 17.52 Non-intact		Medium strong, light grey, slightly weathered, GRANITE. (IGNEOUS INTRUSION).		
	100	NI			17.80			Fractures very closely to closely spaced, planar and stepped rough,		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
07-03-13	17.00	14.00	3.50	47.6mm		

Rotary Flush			
From	To	Type	Returns

General Comments

Borehole open holed to 2.0m. Hole continued by rotary coring using T6116 core barrel and water flush to 13.2m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PH

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH6
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	06-03-13 19-03-13			
Engineer		Client		Sheet
		Wolf Minerals (UK) Ltd		3 of 6

RUN DETAILS			STRATA							
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
	(89) 59	50 310						dipping ~50°, moderate weathering on occasional fracture. Weak, light to dark grey, slightly weathered locally, SLATE. (UPPER DEVONIAN SLATES).		
19.00					(2.30)			Fractures extremely closely to closely spaced, cleavage parallel, planar smooth and stepped rough dipping 20-40°. *(continued)*		
	90 (75) 12	NI 30 125				19.40 - 19.60 Non-intact 19.80 - 19.85 Non-intact				
20.10					20.10			Medium strong, light to dark grey, locally slightly weathered, SLATE. (UPPER DEVONIAN SLATES).		
	91 (76) 51	NI 70 380				20.40 - 20.47 Non-intact 20.84 - 21.10 Non-intact 21.25 - 21.35 Non-intact 21.90 - 22.00 Non-intact 22.10 - 22.16 Non-intact		Fractures planar smooth, occasionally planar rough and stepped rough, dipping 50° and 0-20°, light iron staining along multiple fractures.		
22.60					(4.40)					
	100 (58) 38	NI 25 150				22.95 - 23.30 Non-intact 23.45 - 23.52 Non-intact 23.80 - 24.04 Non-intact 24.20 - 24.50 Non-intact				
24.50					24.50			Medium strong, dark grey, locally moderately weathered SLATE. Very little structure remaining. (UPPER DEVONIAN SLATES).		
	100 (96)	NI 80				25.35 - 25.47 Non-intact		Fractures extremely close to medium spaced, planar and stepped rough, dipping 0-20°, iron staining on occasional fractures.		

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
08-03-13	17.00	26.00	3.50	47.6mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 2.0m. Hole continued by rotary coring using T6116 core barrel and water flush to 13.2m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PH

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH6
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	06-03-13 19-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			4 of 6

RUN DETAILS			STRATA							
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
	72	410						Medium strong, dark grey, locally moderately weathered SLATE. Very little structure remaining. (UPPER DEVONIAN SLATES). Fractures extremely close to medium spaced, planar and stepped rough, dipping 0-20°, iron staining on occasional fractures. *(continued)*		
27.30										
	100 (95) 47	NI 90 250				29.00 - 29.15 Non-intact				
30.30						30.30 - 30.40 Non-intact				
	70 (38) 09	NI 15 150				31.00 - 31.64 Non-intact				
32.00						31.74 - 32.00 Non-intact				
	92 (80) 38	NI 80 340				32.45 - 32.55 Non-intact 33.25 - 33.30 Non-intact 33.60 - 33.90 Non-intact				

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
11-03-13	17.00	32.00	3.50	47.6mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 2.0m. Hole continued by rotary coring using T6116 core barrel and water flush to 13.2m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PH

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH6
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	06-03-13 19-03-13			
Engineer		Client		Sheet
		Wolf Minerals (UK) Ltd		5 of 6

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
34.40								Medium strong, dark grey, locally moderately weathered SLATE. Very little structure remaining. (UPPER DEVONIAN SLATES). Fractures extremely close to medium spaced, planar and stepped rough, dipping 0-20°, iron staining on occasional fractures. *(continued)*		
36.10	100 (73) 33	NI 80 300			(22.00)	35.54 - 36.00 Non-intact				
38.50	100 (96) 61	NI 110 200				38.20 - 38.30 Non-intact				
41.40	100 (45) 52	NI 110 260				39.60 - 39.70 Non-intact 39.80 - 40.00 Non-intact				
41.80	100 (70) 38	NI 50 150				40.60 - 40.75 Non-intact				

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
12-03-13	17.00	41.00	3.50	47.6mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 2.0m. Hole continued by rotary coring using T6116 core barrel and water flush to 13.2m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PH

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH6
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	06-03-13 19-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			6 of 6

RUN DETAILS			STRATA							
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
	96 (79) 41	NI 70 290				42.00 - 42.05 Non-intact 42.25 - 42.83 Non-intact 43.25 - 43.30 Non-intact 44.00 - 44.10 Non-intact 44.20 - 44.30 Non-intact		Medium strong, dark grey, locally moderately weathered SLATE. Very little structure remaining. (UPPER DEVONIAN SLATES). Fractures extremely close to medium spaced, planar and stepped rough, dipping 0-20°, iron staining on occasional fractures. *(continued)*		
44.60										
	100 (77) 45	NI 70 260				44.90 - 44.95 Non-intact 46.00 - 46.10 Non-intact				
46.40					46.50					
					(0.45) 46.95			Medium strong light grey, slightly weathered, GRANITE. (IGNEOUS INTRUSION). Fractures very closely to closely spaced, planar and stepped rough, dipping ~50°, weathering present on localised fractures.		
	100 (77) 39	NI 70 160				46.91 - 47.05 Non-intact 47.30 - 47.35 Non-intact				
48.50					(3.05)	48.20 - 48.30 Non-intact 48.40 - 48.50 Non-intact 48.70 - 48.90 Non-intact 49.00 - 49.05 Non-intact 49.10 - 49.20 Non-intact 49.60 - 49.70 Non-intact		Medium strong, dark grey, locally highly weathered SLATE. Very little structure remaining. (UPPER DEVONIAN SLATES). Fractures extremely close to medium spaced, planar and stepped rough, dipping 0-20°, iron staining on occasional fractures.		
	93 (66) 25	NI 60 270								
50.00					50.00	49.85 - 50.00 Non-intact				

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
13-03-13	17.00	50.00	3.50	47.6mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 2.0m. Hole continued by rotary coring using T6116 core barrel and water flush to 13.2m. Hole then continued by NQ wireline method with water flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Beretta T44	Logged By PH

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH7
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	19-03-13 21-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			1 of 8

RUN DETAILS			STRATA						
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
3.20	19 (0) 0	NI			(2.80)	3.20 - 15.50 Non-intact		Extremely weak, pink and cream, completely weathered, GRANITE. Recovered as clayey fine gravel. (IGNEOUS INTRUSION).		
4.80										
6.00	82 (0) 0	NI			6.00					
7.50	80 (9) 8							Extremely weak, pale yellow, highly weathered, GRANITE. (IGNEOUS INTRUSION). Occasional quartz and tourmaline veins dipping at 45°. Locally completely weathered to clayey gravel. Fractures largely obscured by state of weathering.		
9.30	49 (0) 0	NI								
	70 (0) 0	NI			(9.50)					

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
19-03-13	17.00	11.00		92mm		

Rotary Flush

From	To	Type	Returns
3.2	3.02	Air mist	

General Comments

Borehole open holed to 3.2m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH7
Job No: RP5534	Date: 19-03-13 21-03-13	Ground Level (m):	Co-Ordinates ():	
Engineer:	Client: Wolf Minerals (UK) Ltd			Sheet: 2 of 8

RUN DETAILS			STRATA							
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
11.50								Extremely weak, pale yellow, highly weathered, GRANITE. (IGNEOUS INTRUSION).		
13.50	23 (0) 0							Occasional quartz and tourmaline veins dipping at 45°. Locally completely weathered to clayey gravel. Fractures largely obscured by state of weathering. *(continued)*		
15.00	45 (0) 0									
16.50	80 (30) 30	NI 60 380			15.50			Very weak locally extremely weak, pale yellow and cream, highly weathered, GRANITE. Locally completely weathered to clayey gravel. (IGNEOUS INTRUSION).		
18.00	94 (41) 27	NI 70 140				16.50 - 16.65 Non-intact 17.30 - 18.50 Non-intact		Fractures generally closely to medium spaced, stepped and undulating rough, dipping at 5° to 45°.		
	75	NI			(7.10)					

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

General Comments

Borehole open holed to 3.2m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor: Ground Search	Method/ Plant Used: Pilcon T30 MK2	Logged By: PW

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH7
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	19-03-13 21-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			3 of 8

RUN DETAILS			STRATA							
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
	(33) 33	100 100						Very weak locally extremely weak, pale yellow and cream, highly weathered, GRANITE. Locally completely weathered to clayey gravel. (IGNEOUS INTRUSION).		
20.40						20.10 - 28.20 Non-intact 20.30 - 22.20 Non-intact		Fractures generally closely to medium spaced, stepped and undulating rough, dipping at 5° to 45°. *(continued)*		
	46 (18) 18	NI 100 200								
22.60					22.60					
	79 (0) 0	NI			(1.40)	22.60 - 24.00 Non-intact		Extremely weak, red and cream, highly to completely weathered, GRANITE. Generally recovered as clayey gravel. (IGNEOUS INTRUSION).		
24.00					24.00					
	88 (85) 69	NI 150 500						Very weak, yellow brown red and cream, highly weathered, GRANITE. (IGNEOUS INTRUSION). Fractures are closely to medium spaced, stepped and undulating rough, dipping at 10° to 45°.		
26.60										
	100	NI			(6.20)					

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
20-03-13	17.00	22.70		92mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 3.2m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH7
Job No: RP5534	Date: 19-03-13 21-03-13	Ground Level (m):	Co-Ordinates ():	
Engineer:	Client: Wolf Minerals (UK) Ltd			Sheet: 4 of 8

RUN DETAILS			STRATA							
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
	(36) 36	110 250						Very weak, yellow brown red and cream, highly weathered, GRANITE. (IGNEOUS INTRUSION).		
28.00	50							Fractures are closely to medium spaced, stepped and undulating rough, dipping at 10° to 45°. *(continued)*		
28.20	(0) 0	NI								
	83 (80) 63	NI 120 230				29.75 - 29.80 Non-intact				
30.20					30.20					

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing
21-03-13	17.00	30.00		92mm		

Rotary Flush

From	To	Type	Returns

General Comments

Borehole open holed to 3.2m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor: Ground Search	Method/ Plant Used: Pilcon T30 MK2	Logged By: PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH7
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	19-03-13 21-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			5 of 8

RUN DETAILS			STRATA							
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

General Comments

Borehole open holed to 3.2m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH7
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	19-03-13 21-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			6 of 8

RUN DETAILS			STRATA							
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

General Comments

Borehole open holed to 3.2m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH7
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	19-03-13 21-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			7 of 8

RUN DETAILS			STRATA							
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

General Comments

Borehole open holed to 3.2m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

RED ROCK GEOSCIENCE LTD

DRILLHOLE LOG

Project				DRILLHOLE No
Hemerdon Mine, Plympton				BH7
Job No	Date	Ground Level (m)	Co-Ordinates ()	
RP5534	19-03-13 21-03-13			
Engineer	Client			Sheet
	Wolf Minerals (UK) Ltd			8 of 8

RUN DETAILS			STRATA							
Depth	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION			Geology	Instrument/ Backfill
						Discontinuities	Detail	Main		
		NI 100								

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

General Comments

Borehole open holed to 3.2m. Hole then continued by rotary coring using T6116 core barrel and air mist flush.

All dimensions in metres Scale 1:50	Contractor Ground Search	Method/ Plant Used Pilcon T30 MK2	Logged By PW

AGS3 UK DH RP5534 BH LOGS.GPJ AGS3_ALL.GDT 04/04/13

APPENDIX 3C-6

Laboratory Certificates from Total Sulphur Testing (Phase I)

Wheal Jane Laboratory

Wheal Jane Services, Old Mine Offices, Wheal Jane, Baldhu, Truro, Cornwall TR3 6EE
Telephone (01872) 560200, Direct Line (01872) 562023, Facsimile (01872) 562000
E-mail crice@wheal-jane.co.uk

Test Report

WJL ID No: 42549 – 42572, 42586- 42594, 42608 - 42620
Report No: 12121001a (2 Pages)

Sample(s) Received: 07/12/12
Sample(s) Tested: 07-09/12/12
Tested By: AA IN
Test Procedure: O2

For the attention of: **Name:** Nigel MacDonald
Company: **SGS**
Subject: Hemerdon Geochem

Sample	%S
SGS383	
DDH-1007	
0018A 1.5m Kaolinised Granite	<0.01
0019A 7.5m Kaolinised Granite	<0.01
0020A 8.5m Quartz	<0.01
0021A 12.5m Kaolinised Granite	<0.01
0022A 24.5m Killas	0.02
0023A 33.5m Killas	0.02
0024A 38m Quartz	<0.01
0025A 39.5m Killas	0.04
0026A 50m Killas	<0.01
0027A 60m Killas	0.05
0028A 66m Greisen	0.04
DDH-1008	
0029A 13m Killas	<0.01
0030A 18m Quartz	0.02
0031A 38m Killas	0.03
0032A 42m Killas	<0.01
0033A 79m Greisen	0.08
0034A 99m Killas	<0.01
0035A 105m Killas	0.01
0036A 106m Quartz	<0.01
0037A 1198m Greisen	<0.01
0038A 119m Quartz	0.10
0039A 147m Greisen	<0.01
0040A 162m Granite	<0.01
0041A 214m Greisen	<0.01
DDH-1039	
0093A 54m Granite	<0.01
0094A 75m Granite	<0.01
0095A 136m Granite	<0.01

Sample	%S
SGS383	
DDH-1020	
0042A 30m Kaolinised Granite	<0.01
0043A 118m Granite	<0.01
0044A 135m Granite	0.01
0045A 170m Quartz	<0.01
0046A 228m Killas	<0.01
0047A 236m Killas	<0.01
DDH-1046	
0096A 6m Killas	<0.01
0097A 15m Killas	<0.01
0098A 42m Quartz	<0.01
0099A 48.5m Killas	0.02
0100A 71m Killas	0.08
0101A 79m Killas	0.01
0102A 95m Killas	<0.01
DDH-1032	
0083A 4.5m Killas	0.15
0084A 31.5m Killas	<0.01
0085A 55.5m Killas	0.02
0086A 70m Killas	<0.01
0087A 98m Granite	0.01
0088A 127m Greisen	0.02

Signed		Authorised Signatories:	Signed by:	Checked by:
		Clifford Rice, Laboratory Director	**X**	
		Liam Palmer, Laboratory Manager		
Dated	10/12/12	Karen Hocking, Systems Technician		**X**

Wheal Jane Laboratory

Wheal Jane Services, Old Mine Offices, Wheal Jane, Baldhu, Truro, Cornwall TR3 6EE
Telephone (01872) 560200, Direct Line (01872) 562023, Facsimile (01872) 562000
E-mail crice@wheal-jane.co.uk

Test Report

WJL ID No: 42622 – 42636
Report No: 12121001b

Sample(s) Received: 10/12/12
Sample(s) Tested: 10/12/12
Tested By: IN
Test Procedure: O2

For the attention of: **Name:** Nigel MacDonald
Company: **SGS**
Subject: Hemerdon Geochem

Sample	%S
SGS383	
DDH-1025	
0048A 14m Killas	<0.01
0049A21.5m Killas	0.01
0050A24m Greisen	0.03
0051A 32m Killas	0.01
0052A 39m Killas	<0.01
0055A 73m Quartz	0.52
0058A 146m Killas	0.04
0059A 172m Granite	0.06
0060A 172m Killas	0.07
0061A 192m Killas	<0.01
0062A 221m Killas	<0.01

		Authorised Signatories:	Signed by:	Checked by:
Signed		Clifford Rice, Laboratory Director	**X**	
		Liam Palmer, Laboratory Manager		
Dated	10/12/12	Karen Hocking, Systems Technician		**X**

Wheal Jane Laboratory

Wheal Jane Services, Old Mine Offices, Wheal Jane, Baldhu, Truro, Cornwall TR3 6EE
Telephone (01872) 560200, Direct Line (01872) 562023, Facsimile (01872) 562000
E-mail crice@wheal-jane.co.uk

Test Report

WJL ID No: 43367 – 43372
Report No: 13010901d

Sample(s) Received: 04/01/13
Sample(s) Tested: 08-09/01/13
Tested By: AA
Test Procedure: O2-3

For the attention of: **Name:** Nigel MacDonald
Company: **SGS**
Subject: Hemerdon Geochem

Sample	%S
SGS383	
T710	
0141A -9mm +0.5mm	0.08
0142A Composite Tailings	<0.01
A14870	
0182A Hard Granite Float	0.01
0183A Soft Granite Float	0.03
0184A Hard Granite Tails	0.04
0185A Soft Granite Tails	<0.01

Signed		Authorised Signatories:	Signed by:	Checked by:
		Clifford Rice, Laboratory Director	**X**	
		Liam Palmer, Laboratory Manager		
Dated	09/01/13	Karen Hocking, Systems Technician		**X**

APPENDIX 3C-7

Phase I ICP analysis

Statistics for all 50 elements per lithology and results certificates

Lith.		S[%]_	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu	Fe	Ga	Ge	Hf	Hg	In	K	La	Li	Lu	Mg	Mn	Mo	Na	Nb	Ni	P	Pb	Rb	Sb	Sc	Se	Sn	Sr	Ta	Tb	Th	Ti	Tl	U	V	W	Y	Yb	Zn	Zr
Brecciated killas n=2	Min	0.01	1	12000	92	1	67	2	48	73	1	6	4	100	130	11000	9	1	1	1	3	7100	3	370	1	1300	350	5	130	7	18	210	4	13	7	9	1	24	13	1	1	7	1200	1	1	70	68	7	1	79	6
	Max	0.01	1	20000	800	2	120	7	99	77	3	8	9	170	780	13000	18	1	1	1	3	7700	5	470	4	1400	390	5	140	9	31	1600	4	24	16	11	1	29	23	1	3	27	1400	1	10	78	440	16	3	100	15
	Median	0.01	1	16000	446	1.5	94	4.5	74	75	2	7	6.5	135	455	12000	14	1	1	1	3	7400	4	420	2.5	1350	370	5	135	8	25	905	4	19	12	10	1	27	18	1	2	17	1300	1	5.5	74	254	12	2	90	11
	Mean	0.01	1	16000	446	1.5	94	4.5	74	75	2	7	6.5	135	455	12000	14	1	1	1	3	7400	4	420	2.5	1350	370	5	135	8	25	905	4	19	12	10	1	27	18	1	2	17	1300	1	5.5	74	254	12	2	90	11
Granite n=7	Min	0.01	1	2700	7	1	9	1	1	73	1	7	1	68	8	1700	1	1	1	1	1	1700	3	17	1	89	15	1	74	1	3	46	2	5	2	1	1	2	5	1	1	2	8	1	1	1	11	4	1	5	5
	Max	0.04	1	7700	71	4	54	1	11	840	1	20	5	98	120	6100	2	1	1	1	1	2300	9	54	1	260	38	4	260	1	5	420	7	13	7	1	2	9	13	1	1	4	23	1	5	3	250	14	1	25	9
	Median	0.01	1	4600	22	2	14	1	7	92	1	16	2	81	21	2700	1	1	1	1	1	1900	7	27	1	140	20	1	100	1	4	72	5	8	5	1	1	3	8	1	1	2	12	1	1	1	53	5	1	7	7
	Mean	0.014	1	4686	28.6	1.9	25	1	6	220	1	15	2	81	33	3129	1.3	1	1	1	1	1914	6.1	30	1	163	24	1.4	127	1	4	135	4.9	8.6	4.7	1	1.1	4.1	8.3	1	1	2.9	12.3	1	1.7	1.4	76	6.1	1	9.9	7.1
Granite-Iron Oxide n=1	Min	0.01	1	4600	100	1	100	1	2	100	1	13	6	93	89	4600	1	1	1	1	1	1700	6	25	1	170	52	1	120	1	6	140	7	23	21	1	2	3	22	1	1	2	11	1	4	3	290	6	1	11	5
	Max	0.01	1	4600	100	1	100	1	2	100	1	13	6	93	89	4600	1	1	1	1	1	1700	6	25	1	170	52	1	120	1	6	140	7	23	21	1	2	3	22	1	1	2	11	1	4	3	290	6	1	11	5
	Median	0.01	1	4600	100	1	100	1	2	100	1	13	6	93	89	4600	1	1	1	1	1	1700	6	25	1	170	52	1	120	1	6	140	7	23	21	1	2	3	22	1	1	2	11	1	4	3	290	6	1	11	5
	Mean	0.01	1	4600	100	1	100	1	2	100	1	13	6	93	89	4600	1	1	1	1	1	1700	6	25	1	170	52	1	120	1	6	140	7	23	21	1	2	3	22	1	1	2	11	1	4	3	290	6	1	11	5
Greisen n=4	Min	0.01	1	4600	17	1	15	1	5	42	1	8	1	64	4	2900	2	1	1	1	1	2400	3	43	1	130	27	1	100	1	3	55	2	3	3	1	1	7	3	1	1	1	11	1	1	1	19	3	1	6	4
	Max	0.04	1	14000	380	23	51	1	42	1300	1	29	5	110	30	8700	4	1	1	1	1	5800	14	270	1	1200	200	4	260	3	13	740	5	7	5	2	3	18	7	1	1	3	700	1	3	26	400	7	1	29	21
	Mean	0.023	1	7500	116	11	30	1	18	382	1	16	2	87	13	4550	3	1	1	1	1	3450	7	122	1	430	81	2	165	1.5	6	234	3.3	5.3	4	1.3	1.5	12	5.3	1	1	2	187	1	1.5	7.8	139	5	1	15	9.8
	Median	0.02	1	5700	32.5	9.5	26	1	13	93.5	1	13	1	86	9	3300	3	1	1	1	1	2800	5.5	87	1	195	49	1.5	150	1	4	69.5	3	5.5	4	1	1	12	5.5	1	1	2	18	1	1	2	68	5	1	13	7
Greisenised Granite n=3	Min	0.01	1	3400	9	1	7	1	2	17	1	9	1	21	7	2200	1	1	1	1	1	1900	4	19	1	120	16	1	100	1	1	26	2	2	2	1	1	3	1	1	1	2	8	1	1	1	19	1	1	8	6
	Max	0.01	3	5400	43	4	15	1	5	280	1	15	2	120	38	2600	3	1	1	1	1	3200	7	110	1	180	27	2	140	1	6	150	3	6	5	1	1	13	5	1	1	4	14	1	3	2	120	5	1	13	7
	Mean	0.01	1.7	4467	30	2.7	11	1	3	146	1	12	1.3	73	19	2467	2	1	1	1	1	2633	5.3	59	1	150	23	1.3	120	1	3.7	87.7	2.3	4	3.7	1	1	7.7	3.3	1	1	3	12	1	1.7	1.3	59	3	1	10	6.3
	Median	0.01	1	4600	38	3	12	1	2	140	1	12	1	77	12	2600	2	1	1	1	1	2800	5	49	1	150	25	1	120	1	4	87	2	4	4	1	1	7	4	1	1	3	14	1	1	1	38	3	1	9	6
Greisenised Granite/Greisen n=7	Min	0.01	1	3400	9	1	7	1	2	17	1	8	1	21	4	2200	1	1	1	1	1	1900	3	19	1	120	16	1	100	1	1	26	2	2	2	1	1	3	1	1	1	1	8	1	1	1	19	1	1	6	4
	Max	0.04	3	14000	380	23	51	1	42	1300	1	29	5	120	38	8700	4	1	1	1	1	5800	14	270	1	1200	200	4	260	3	13	740	5	7	5	2	3	18	7	1	1	4	700	1	3	26	400	7	1	29	21
	Median	0.01	1	4600	34	4	15	1	5	120	1	12	1	77	10	2900	3	1	1	1	1	2800	5	77	1	150	27	1	130	1	4	82	2	4	4	1	1	9	4	1	1	2	14	1	1	1	38	4	1	10	6
	Mean	0.017	1.3	6200	78.9	7.3	22	1	12	281	1	14	1.7	81	16	3657	2.6	1	1	1	1	3100	6.3	95	1	310	56	1.7	146	1.3	5	171	2.9	4.7	3.9	1.1	1.3	10	4.4	1	1	2.4	112	1	1.6	5	104	4.1	1	13	8.3
Kaolinised ranite n=9	Min	0.01	1	3800	11	1	8	1	1	39	1	8	1	59	4	1400	1	1	1	1	1	1100	4	11	1	70	10	1	57	1	3	37	2	5	2	1	1	1	5	1	1	1	5	1	1	1	11	3	1	4	4
	Max	0.19	1	7700	2000	2	77	1	53	1800	1	19	5	100	230	4900	2	1	1	1	1	2500	8	57	1	220	43	6	130	1	6	730	27	21	11	3	1	7	20	1	1	5	15	1	7	4	180	33	2	59	16
	Median	0.01	1	5300	32	1	26	1	7	85	1	15	2	68	19	2100	2	1	1	1	1	1600	6	22	1	130	14	1	79	1	4	87	5	10	4	1	1	2	10	1	1	3	8	1	2	2	56	9	1	5	6
	Mean	0.032	1	5522	250	1.2	32	1	13	268	1	15	2.4	78	46	2589	1.6	1	1	1	1	1589	6.3	25	1	125	17	1.9	87	1	3.8	154	7.3	11	5.4	1.2	1	3	11	1	1	2.8	8.67	1	2.3	1.8	85	11	1.1	13	7.6
Killas n=7	Min	0.01	1	13000	10	1	70	1	1	44	1	11	1	40	22	8700	4	1	1	1	1	3800	5	29	1	540	7	1	51	3	4	36	2	3	3	2	1	2	3	1	1	2	93	1	1	26	6	3	1	17	11
	Max	0.15	1	25000	470	73	170	2	6	500	1	54	14	81	130	12000	10	2	1	1	4	8900	29	500	1	1400	670	3	230	8	49	380	22	17	9	7	1	41	17	1	1	13	1800	2	8	73	240	30	2	76	29
	Median	0.01	1	18000	39	5	100	2	1	60	1	40	2	55	71	11000	9	1	1	1	2	4700	20	130	1	1200	130	1	200	5	12	160	3	10	5	5	1	13	10	1	1	9	670	1	1	52	36	7	1	25	16
	Mean	0.037	1	18571	149	14	110	1.6	2.1	125	1	37	4.3	61	71	10557	7.7	1.1	1	1	2.4	5943	19	194	1	1127	242	1.4	169	5.1	19	181	5.6	9.9	5.3	4.9	1	18	9.9	1	1	7.3	970	1.1	2	48	62	9.7	1.1	39	17
Quartz n=2	Min	0.01	1	470	12	4	4	1	2	75	1	1	3	300	12	3600	1	1	1	1	1	210	1	4	1	40	26	3	74	1	8	8	2	1	9	1	1	2	1	1	1	1	8	1	2	1	18	1	1	5	2
	Max	0.1	1	820	94	28	4	1	10	170	1	1	4	350	22	5600	1	1	1	1	1	210	1	5	1	50	34	9	110	1	11	49	63	1	14	1	1	3	1	1	1	3	8	1	4	6	130	1	1	14	3
	Median	0.055	1	645	53	16	4	1	6	123	1	1	3.5	325	17	4600	1	1	1	1	1	210	1	4.5	1	45	30	6	92	1	9.5	28.5	33	1	12	1	1	2.5	1	1	1	2	8	1	3	3.5	74	1	1	9.5	2.5
	Mean	0.055	1	645	53	16	4	1	6	123	1	1	3.5	325	17	4600	1	1	1	1	1	210	1	4.5	1	45	30	6	92	1	9.5	28.5	33	1	12	1	1	2.5	1	1	1	2	8	1	3	3.5	74	1	1	9.5	2.5
Average Earth's Crust [ppm]			0.1		1.8	10	425	2.8	0.2		0.2	60	25	100	55		15	1.5	3	0.1	0.1		30	20	0.5		950	1.5		20	75		13	90	0.2	16	0.1	2	375	2	0.9	10	5700	0.5	2.7	135	1.5	30	3	70	165

Wheal Jane Laboratory

Issue 5

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Test Report

WJL ID No: 43357 - 43372
Report No: 13011001h (2 Pages)
Sample(s) Received: 04/01/13
Sample(s) Tested: 10-14/01/13
Tested By: DP KK
Test Procedure: O3

For the attention of: **Name:** Nigel MacDonald
Company: **SGS**
Subject: Hemerdon GeoMet

Sample	Ag	Al	As	B	Ba	Be	Bi
SGS383	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
T710							
0141A -9mm +0.5mm	<1	5400	150	5	18	<1	23
0142A Composite Tails	<1	10000	920	5	62	1	240
A14870							
0182A Hard Granite Float	<1	6000	280	5	37	1	26
0183A Soft Granite Float	<1	9600	67	6	41	1	23
0184A Hard Granite Tails	<1	7900	330	6	60	1	45
0185A Soft Granite Tails	<1	11000	160	4	91	1	40

Sample	Cd	Ce	Co	Cr	Cu	Fe	Ga
SGS383	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
T710							
0141A -9mm +0.5mm	<1	4	3	210	24	6100	3
0142A Composite Tails	<1	17	3	90	98	11000	4
A14870							
0182A Hard Granite Float	<1	10	2	150	31	5400	3
0183A Soft Granite Float	<1	9	2	190	18	5100	3
0184A Hard Granite Tails	<1	9	5	290	77	7200	3
0185A Soft Granite Tails	<1	9	3	210	43	5400	3

Sample	Hf	Hg	In	K	La	Li	Lu
SGS383	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
T710							
0141A -9mm +0.5mm	<1	<1	<1	2100	3	35	<1
0142A Composite Tails	<1	<1	<1	2300	11	46	<1
A14870							
0182A Hard Granite Float	<1	<1	<1	2700	6	44	<1
0183A Soft Granite Float	<1	<1	<1	2600	6	68	<1
0184A Hard Granite Tails	<1	<1	<1	2900	6	47	<1
0185A Soft Granite Tails	<1	<1	<1	2300	5	53	<1

Sample	Mn	Mo	Na	Nb	Ni	P	Pb
SGS383	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
T710							
0141A -9mm +0.5mm	71	3	150	1	8	60	2
0142A Composite Tails	230	4	190	2	10	190	4
A14870							
0182A Hard Granite Float	41	3	140	<1	8	130	2
0183A Soft Granite Float	48	3	91	<1	9	69	2
0184A Hard Granite Tails	64	13	130	<1	110	170	5
0185A Soft Granite Tails	45	11	100	<1	87	130	8

Sample	Sb	Sc	Se	Sn	Sr	Ta	Tb
SGS383	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
T710							
0141A -9mm +0.5mm	4	1	2	6	8	1	<1
0142A Composite Tails	9	4	2	7	21	<1	1
A14870							
0182A Hard Granite Float	4	<1	3	6	14	1	<1
0183A Soft Granite Float	2	<1	3	7	13	1	<1
0184A Hard Granite Tails	5	<1	2	7	20	1	<1
0185A Soft Granite Tails	6	1	4	6	24	1	<1

Sample	Ti	Tl	U	V	W	Y	Yb
SGS383	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
T710							
0141A -9mm +0.5mm	75	<1	<1	7	180	2	<1
0142A Composite Tails	91	<1	<1	13	180	6	1
A14870							
0182A Hard Granite Float	14	<1	<1	2	270	6	<1
0183A Soft Granite Float	15	<1	<1	2	210	5	<1
0184A Hard Granite Tails	14	<1	<1	3	250	7	1
0185A Soft Granite Tails	11	<1	<1	3	310	7	1

Sample	Zr
SGS383	mg/kg
T710	
0141A -9mm +0.5mm	6
0142A Composite Tails	10
A14870	
0182A Hard Granite Float	7
0183A Soft Granite Float	6
0184A Hard Granite Tails	7
0185A Soft Granite Tails	8

Signed		Authorised Signatories:	Signed by
		Clifford Rice, Laboratory Director	X
		Liam Palmer, Laboratory Manager	
Dated	15/01/2013	Karen Hocking, Systems Technician	

Ca mg/kg	
2700	
2500	
190	
88	
330	
180	
Ge mg/kg	
<1	
<1	
<1	
<1	
<1	
<1	
Mg mg/kg	
740	
950	
210	
200	
320	
210	

Rb mg/kg
<1
<1
<1
<1
<1
<1
<1
Th mg/kg
<1
<1
<1
<1
<1
<1
Zn mg/kg
13
34
11
9
23
17

Checked by
X

Wheal Jane Laboratory

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Test Report

WJL ID No: See Sheet
Report No: 13010801a (9 Pages)
Sample(s) Received: 07/01/13
Sample(s) Tested: 07-08/01/13
Tested By: LP
Test Procedure: M40, O3

For the attention of: **Name:** Nigel MacDonald
Company: **SGS**
Subject: Hemerdon GeoMet

Sample	SGS383 0143 Greisen 11m	0144 Killas 63m	0145 Granite 101m	0146 Kao Granite 149m	0147 Kao Granite 12.5m	0148 Quartz 38m
(mg/kg)						
Ag	<1	<1	<1	<1	<1	<1
Al	4600	18000	3600	4700	5000	820
As	17	180	11	24	11	94
B	<1	3	4	1	<1	28
Ba	15	100	42	36	23	4
Be	<1	2	<1	1	<1	<1
Bi	19	4	10	11	2	2
Ca	1300	96	92	86	39	75
Cd	<1	1	<1	<1	<1	<1
Ce	12	29	14	19	10	1
Co	5	2	2	2	1	4
Cr	72	54	81	82	68	350
Cu	8	71	11	19	4	22
Fe	2900	11000	3200	2100	1400	5600
Ga	3	8	1	1	1	1
Ge	<1	<1	<1	<1	<1	<1
Hf	<1	<1	<1	1	<1	<1
Hg	<1	<1	<1	<1	<1	<1
In	<1	2	<1	<1	<1	1
K	2700	4300	1900	1600	1600	210
La	5	14	5	8	4	1
Li	97	110	20	22	26	4
Lu	1	1	<1	<1	<1	<1
Mg	140	1200	130	130	70	50
Mn	61	110	21	14	14	34
Mo	4	3	1	2	1	9
Na	130	51	140	79	57	110
Nb	<1	5	<1	<1	<1	<1
Ni	3	8	4	4	3	11
P	740	260	67	89	37	49
Pb	5	4	7	5	3	63
Rb	7	10	12	7	5	1

Sample	SGS383 0143 Greisen 11m	0144 Killas 63m	0145 Granite 101m	0146 Kao Granite 149m	0147 Kao Granite 12.5m	0148 Quartz 38m
(mg/kg)						
Sb	4	9	5	4	3	14
Sc	<1	7	<1	<1	1	<1
Se	3	1	<1	<1	<1	<1
Sn	9	13	5	2	3	3
Sr	7	10	11	7	5	1
Ta	<1	<1	<1	<1	<1	1
Tb	<1	1	<1	<1	<1	<1
Th	1	2	2	3	1	3
Ti	11	670	12	6	6	8
Tl	<1	<1	<1	<1	<1	<1
U	<1	<1	<1	2	<1	4
V	1	48	1	2	1	6
W	400	240	53	97	55	130
Y	7	30	4	11	3	1
Yb	<1	2	<1	1	<1	<1
Zn	10	25	12	5	4	14
Zr	4	11	9	10	8	3

Sample	SGS383 0149 Killas 39.5m	0150 Greisen 66m	0151 Greisen 118m	0152 Quartz 119m	0153 Granite 162m	0154 Kao Granite 30m
(mg/kg)						
Ag	<1	<1	<1	<1	<1	<1
Al	13000	14000	4600	470	6100	3800
As	280	380	34	12	25	34
B	73	11	8	4	1	2
Ba	75	51	34	4	10	52
Be	1	1	1	<1	1	<1
Bi	<1	42	6	10	2	53
Ca	56	42	67	170	75	62
Cd	<1	<1	<1	<1	<1	<1
Ce	41	29	8	1	11	8
Co	1	1	1	3	1	3
Cr	55	64	110	300	70	96
Cu	43	4	30	12	29	15
Fe	8700	8700	3700	3600	2500	4900
Ga	4	4	2	1	1	2
Ge	<1	<1	<1	<1	<1	<1
Hf	1	1	<1	<1	<1	<1
Hg	<1	<1	<1	<1	<1	<1
In	1	1	<1	<1	<1	<1
K	4700	5800	2400	210	1700	2000
La	20	14	3	<1	4	4
Li	130	270	43	5	39	21
Lu	1	<1	<1	<1	<1	<1
Mg	1000	1200	130	40	140	82
Mn	100	200	27	26	15	19
Mo	1	1	1	3	1	1
Na	200	170	100	74	92	120
Nb	3	3	<1	<1	<1	<1
Ni	8	13	4	8	3	4
P	160	55	82	8	46	87
Pb	2	4	2	2	5	3
Rb	7	3	4	1	6	18
Sb	4	3	5	9	6	11
Sc	3	2	<1	<1	<1	<1
Se	<1	<1	<1	<1	<1	1
Sn	13	18	7	2	3	5
Sr	7	3	4	1	6	18
Ta	<1	<1	<1	1	<1	<1
Tb	1	<1	<1	<1	<1	<1
Th	2	3	2	<1	2	2
Ti	450	700	11	8	13	8
Tl	<1	1	<1	<1	<1	<1
U	<1	<1	3	2	1	4
V	26	26	1	1	1	1
W	89	19	100	18	71	180
Y	7	3	6	<1	4	5
Yb	1	1	<1	<1	<1	<1
Zn	21	29	6	5	6	5
Zr	29	21	5	2	7	5

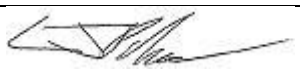
Sample	SGS383 0155 Killas 228m	0156 Greisen 24m	0157 Quartz 73m	0158 Killas 146m	0159 Granite 172m	0160 Quartz 172m
(mg/kg)						
Ag	<1	<1	<1	<1	<1	<1
Al	23000	6800	5700	12000	4400	3800
As	31	31	9300	570	490	500
B	<1	23	9	47	1	10
Ba	170	18	18	95	8	11
Be	2	1	1	1	<1	<1
Bi	1	5	220	<1	35	240
Ca	500	120	2600	250	520	160
Cd	1	<1	<1	<1	<1	<1
Ce	54	14	5	43	14	7
Co	14	1	11	5	9	10
Cr	75	100	220	28	88	250
Cu	87	10	10	32	24	100
Fe	11000	2900	7800	7600	2300	5100
Ga	9	3	3	4	1	1
Ge	1	<1	<1	<1	<1	<1
Hf	<1	<1	<1	1	<1	<1
Hg	<1	<1	<1	<1	<1	<1
In	2	<1	1	1	<1	<1
K	7300	2900	2800	5000	1800	2000
La	29	6	3	21	6	3
Li	150	77	48	160	28	69
Lu	1	<1	1	<1	1	<1
Mg	1400	250	650	1100	150	640
Mn	300	37	73	100	72	56
Mo	<1	2	3	1	3	160
Na	220	260	430	200	120	120
Nb	8	<1	1	3	<1	1
Ni	49	4	7	14	11	16
P	380	57	240	90	240	27
Pb	3	2	10	210	2	6
Rb	15	7	9	3	4	2
Sb	5	4	14	3	5	10
Sc	7	1	1	3	1	1
Se	<1	<1	4	<1	4	<1
Sn	11	14	9	13	3	7
Sr	15	7	9	3	4	2
Ta	1	<1	<1	<1	<1	1
Tb	1	<1	<1	1	<1	<1
Th	9	2	4	4	5	2
Ti	1700	25	96	460	11	120
Tl	1	<1	<1	<1	<1	<1
U	<1	<1	1	<1	8	1
V	73	3	4	21	1	8
W	7	35	530	13	520	98
Y	11	4	3	6	6	1
Yb	1	<1	<1	1	1	<1
Zn	70	16	18	19	6	13
Zr	12	9	13	23	6	6

Sample	SGS383 0161 Killas 27.2m	0162 Greisen Granite 126m	0163 Kao Granite 164m	0164 Granite 222m	0165 Greisen Granite 223m	0166 Greisen Granite 267m
(mg/kg)						
Ag	<1	<1	<1	<1	3	<1
Al	14000	5400	5400	4600	4600	3400
As	32	38	28	7	9	43
B	1	4	1	2	3	1
Ba	93	15	18	10	12	7
Be	1	1	1	<1	<1	1
Bi	<1	2	1	4	2	5
Ca	44	17	81	99	280	140
Cd	<1	<1	<1	<1	<1	<1
Ce	40	9	19	18	15	12
Co	2	<1	1	1	1	2
Cr	40	21	68	68	120	77
Cu	82	12	12	8	7	38
Fe	9200	2200	1800	1700	2600	2600
Ga	4	3	1	1	2	1
Ge	<1	<1	<1	<1	<1	<1
Hf	1	<1	<1	<1	<1	<1
Hg	<1	<1	<1	<1	<1	<1
In	2	<1	<1	<1	<1	<1
K	4200	3200	1400	2200	2800	1900
La	20	4	8	8	7	5
Li	50	110	18	33	49	19
Lu	<1	<1	<1	<1	<1	<1
Mg	950	120	100	140	150	180
Mn	130	25	10	17	27	16
Mo	<1	<1	2	<1	1	2
Na	230	120	70	100	140	100
Nb	3	<1	<1	<1	<1	<1
Ni	12	1	3	3	4	6
P	100	26	87	71	150	87
Pb	2	2	4	3	2	3
Rb	11	2	10	5	4	6
Sb	3	2	3	2	4	5
Sc	2	<1	<1	<1	<1	<1
Se	<1	<1	<1	<1	<1	1
Sn	2	13	1	4	7	3
Sr	11	1	10	5	4	5
Ta	<1	<1	<1	<1	<1	<1
Tb	1	<1	<1	<1	<1	<1
Th	5	2	3	4	3	4
Ti	380	14	5	10	14	8
Tl	<1	<1	<1	<1	<1	<1
U	<1	<1	1	1	1	3
V	31	1	2	1	1	2
W	6	38	56	11	19	120
Y	4	1	15	6	3	5
Yb	1	<1	1	<1	<1	<1
Zn	17	9	4	5	13	8
Zr	16	6	8	8	6	7

Sample	SGS383 0167 Killas 4.5m	0168 Kao Granite 233m	0169 Granite 239m	0170 Granite 136m	0171 Killas 95m	0172 Granite 87m
(mg/kg)						
Ag	<1	<1	<1	<1	<1	<1
Al	14000	5300	4900	7700	23000	2700
As	470	32	22	49	10	15
B	7	1	1	1	11	2
Ba	70	8	9	34	130	54
Be	2	1	1	1	1	<1
Bi	6	4	7	11	1	7
Ca	65	110	280	83	60	73
Cd	1	<1	<1	<1	1	<1
Ce	11	19	16	20	40	7
Co	<1	1	1	2	5	5
Cr	53	100	81	98	71	83
Cu	130	10	12	28	22	21
Fe	11000	2600	2200	3500	12000	6100
Ga	10	1	1	2	9	1
Ge	<1	<1	<1	<1	1	<1
Hf	<1	<1	<1	<1	<1	<1
Hg	<1	<1	<1	<1	<1	<1
In	4	<1	<1	<1	3	1
K	3800	1700	1900	2300	8900	1700
La	5	8	7	9	21	3
Li	29	20	27	54	500	17
Lu	1	<1	<1	<1	1	<1
Mg	540	140	260	170	1400	89
Mn	7	15	20	19	670	36
Mo	1	1	1	4	<1	1
Na	110	100	74	100	170	120
Nb	5	<1	<1	<1	6	<1
Ni	4	4	4	5	26	4
P	270	79	170	100	36	72
Pb	3	2	2	5	3	5
Rb	17	6	6	10	3	13
Sb	6	5	3	6	5	7
Sc	4	<1	<1	<1	5	<1
Se	<1	1	<1	2	<1	<1
Sn	41	2	2	3	34	9
Sr	17	6	6	9	3	13
Ta	<1	<1	<1	<1	1	<1
Tb	1	<1	<1	<1	1	<1
Th	9	5	4	2	13	2
Ti	93	6	23	8	1700	8
Tl	<1	<1	<1	<1	2	<1
U	8	2	2	1	<1	1
V	52	1	1	3	52	1
W	41	140	24	250	18	100
Y	3	9	14	5	7	4
Yb	1	1	1	<1	1	<1
Zn	23	5	6	8	76	7
Zr	11	6	6	7	24	5

Sample	SGS383 0173 Kao Granite 36m	0174 Brec Killas 16m	0175 Brec Killas 17m	0176 Kao Granite 76m	0177 Granite-Iron Ox 134m	0178 Granite 99m
(mg/kg)						
Ag	<1	<1	<1	<1	<1	<1
Al	6300	12000	20000	6300	4600	3200
As	15	92	800	33	100	71
B	1	2	<1	1	1	2
Ba	42	67	120	26	100	14
Be	<1	2	7	<1	1	<1
Bi	9	48	99	<1	2	1
Ca	59	73	77	94	100	840
Cd	<1	1	3	<1	<1	<1
Ce	13	6	8	11	13	16
Co	4	4	9	4	6	2
Cr	62	170	100	65	93	89
Cu	20	130	780	34	89	120
Fe	1500	11000	13000	1900	4600	2700
Ga	2	9	18	2	1	2
Ge	<1	1	1	<1	<1	<1
Hf	<1	<1	<1	<1	<1	<1
Hg	<1	<1	<1	<1	<1	<1
In	<1	3	3	<1	<1	<1
K	1200	7100	7700	1100	1700	1700
La	6	3	5	5	6	7
Li	25	370	470	11	25	18
Lu	<1	1	4	<1	1	<1
Mg	130	1400	1300	150	170	210
Mn	12	390	350	12	52	38
Mo	2	5	5	1	1	1
Na	81	130	140	69	120	260
Nb	<1	9	7	<1	<1	<1
Ni	3	18	31	3	6	5
P	70	210	1600	64	140	420
Pb	12	4	4	5	7	7
Rb	12	13	24	10	23	8
Sb	2	7	16	4	21	4
Sc	<1	11	9	<1	1	<1
Se	<1	<1	<1	<1	2	<1
Sn	2	29	24	2	3	3
Sr	12	13	23	10	22	8
Ta	<1	1	1	<1	<1	<1
Tb	<1	1	3	<1	<1	<1
Th	3	7	27	2	2	4
Ti	13	1400	1200	9	11	12
Tl	<1	1	1	<1	<1	<1
U	1	<1	10	1	4	5
V	2	78	70	1	3	2
W	11	68	440	40	290	21
Y	10	7	16	33	6	6
Yb	1	1	3	2	1	<1
Zn	5	79	100	59	11	25
Zr	4	6	15	5	5	8

Sample	SGS383 0179 Kao Granite 135m	0180 Kao Granite 18m	0181 Killas 154m
(mg/kg)			
Ag	<1	<1	<1
Al	5200	7700	25000
As	2000	72	39
B	2	<1	5
Ba	8	77	130
Be	<1	1	2
Bi	7	31	1
Ca	1800	85	56
Cd	<1	<1	1
Ce	15	19	47
Co	5	1	5
Cr	98	59	81
Cu	230	68	64
Fe	3200	3900	11000
Ga	2	2	10
Ge	<1	<1	2
Hf	1	1	1
Hg	<1	<1	<1
In	<1	<1	3
K	2500	1200	8400
La	6	8	25
Li	57	26	390
Lu	<1	<1	1
Mg	220	100	1400
Mn	43	10	380
Mo	6	1	2
Na	130	76	200
Nb	<1	<1	6
Ni	6	4	24
P	730	140	62
Pb	5	27	22
Rb	8	21	6
Sb	8	9	5
Sc	<1	3	6
Se	<1	1	<1
Sn	7	3	15
Sr	8	20	6
Ta	<1	<1	1
Tb	<1	<1	1
Th	2	4	11
Ti	15	10	1800
Tl	<1	<1	1
U	7	2	<1
V	2	4	55
W	19	170	36
Y	7	5	6
Yb	1	1	1
Zn	20	7	44
Zr	16	6	19

Signed		Authorised Signatories:	Signed by:	Checked by:
		Clifford Rice, Laboratory Director		
		Liam Palmer, Laboratory Manager	**X**	
Dated	08/01/13	Karen Hocking, Systems Technician		**X**

APPENDIX 3C-8

Phase I XRF Results Certificates

Wheal Jane Laboratory

Wheal Jane Services, Old Mine Offices, Wheal Jane, Baldhu, Truro, Cornwall TR3 6EE
Telephone (01872) 560200, Direct Line (01872) 562023, Facsimile (01872) 562000
E-mail crice@wheal-jane.co.uk

Test Report

WJL ID No: See Sheet
Report No: 13011801h (2 Pages)

Sample(s) Received: 14/01/13
Sample(s) Tested: 15-22/01/13
Tested By: AA DP CR LP
Test Procedure: O1

For the attention of: **Name:** Nigel MacDonald
Company: **SGS**
Subject: Hemerdon GeoMet

Sample SGS383	%SiO2	%K	%Ti	%Cr	%Mn	%Fe	%Mg	%Al	%Ca
0143 Greisen	73.6	2.4	0.08	0.02	0.06	1.8	0.25	8.0	0.87
0144 Killas	51.7	1.2	0.66	0.02	0.02	4.4	0.74	14.6	0.76
0145 Granite	80.6	3.8	0.13	0.02	0.02	1.2	0.24	4.6	0.56
0146 Kao Granite	75.6	4.1	0.17	0.03	0.02	1.1	0.22	9.4	0.53
0147 Kao Granite	73.1	1.8	0.12	0.02	0.02	1.3	0.23	9.0	0.62
0148 Quartz	83.0	0.1	0.13	0.08	0.02	1.9	0.22	6.8	0.58
0149 Killas	81.8	1.2	0.35	0.01	0.02	3.4	0.24	7.9	0.56
0150 Greisen	75.6	1.7	0.21	0.01	0.02	1.8	0.23	6.3	0.52
0151 Greisen	82.9	1.6	0.08	0.02	0.02	1.6	0.20	5.8	0.57
0152 Quartz	92.0	0.1	0.04	0.08	0.01	0.7	0.37	3.0	0.73
0153 Granite	70.8	2.4	0.10	0.02	0.01	0.7	0.35	9.3	0.48
0154 Kao Granite	75.6	2.8	0.07	0.02	0.01	0.9	0.36	6.0	0.52
0155 Killas	60.0	1.6	0.40	0.01	0.03	2.7	0.18	9.5	0.45
0156 Greisen	83.1	1.6	0.11	0.03	0.04	2.0	0.22	6.8	0.58
0157 Quartz	80.0	0.2	0.03	0.04	0.01	1.0	0.24	5.0	0.60
0158 Killas	58.0	1.9	0.50	0.01	0.02	3.4	0.38	10.7	0.48
0159 Granite	77.0	2.2	0.10	0.02	0.02	0.8	0.23	8.0	0.53
0160 Quartz	90.9	0.4	0.06	0.04	0.01	0.7	0.48	3.1	0.63
0161 Killas	63.6	2.0	0.41	0.01	0.01	1.8	0.19	9.7	0.44
0162 Greisen Granite	50.2	3.3	0.10	<0.01	0.05	2.1	0.83	10.8	0.38
0163 Kao Granite	76.8	2.4	0.09	<0.01	0.01	0.5	0.23	8.5	0.54
0164 Granite	81.6	3.8	0.12	0.02	0.02	0.8	0.25	8.4	0.56
0165 Greisen Granite	54.0	5.2	0.21	0.06	0.04	2.4	0.65	16.0	0.41
0166 Greisen Granite	78.7	4.2	0.12	0.02	0.01	0.9	0.24	5.3	0.51
0167 Killas	62.4	1.6	0.42	0.01	0.01	2.6	0.49	9.2	0.50
0168 Kao Granite	81.6	3.8	0.14	0.03	0.02	0.9	0.32	8.4	0.63
0169 Granite	62.0	2.9	0.10	0.02	0.01	0.6	0.22	7.1	0.61
0170 Granite	86.4	3.4	0.11	0.03	0.02	1.0	0.26	5.6	0.69
0171 Killas	56.4	2.0	0.32	0.01	0.06	3.4	0.82	7.0	0.56
0172 Granite	85.8	2.3	0.04	0.01	0.01	0.7	0.26	4.8	0.68
0173 Kao Granite	67.2	2.3	0.13	0.02	0.01	0.7	0.33	10.8	0.54
0174 Brec Killas	52.8	1.7	0.62	0.05	0.07	5.6	0.74	13.2	0.69
0175 Brec Killas	37.2	1.0	0.25	0.01	0.02	9.5	0.34	3.5	0.52
0176 Kao Granite	69.6	2.5	0.11	0.02	<0.01	0.5	0.35	10.0	0.53
0177 Granite-Iron Ox	81.6	4.0	0.11	0.02	0.01	1.0	0.28	8.4	0.65

Sample SGS383	%SiO2	%K	%Ti	%Cr	%Mn	%Fe	%Mg	%Al	%Ca
0178 Granite	70.8	3.2	0.10	0.02	<0.01	0.6	0.28	7.5	0.56
0179 Kao Granite	87.6	3.0	0.07	0.02	0.02	0.7	0.26	4.4	0.62
0180 Kao Granite	61.2	1.5	0.13	0.02	0.01	1.1	0.23	13.4	0.49
0181 Killas	58.8	1.9	0.35	0.01	0.03	3.0	0.22	8.2	0.61

Signed		Authorised Signatories:	Signed by:	Checked by:
		Clifford Rice, Laboratory Director	**X**	
		Liam Palmer, Laboratory Manager		
Dated	22/01/13	Karen Hocking, Systems Technician		**X**

APPENDIX 3C-9

Factual report from EN BS 12457-3 Testing (Phase I)

ALcontrol Laboratories

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: mkt@alcontrol.com
Website: www.alcontrol.com

Coffey Geotechnics Limited
9/11 Hornbeam Square South
Hornbeam Park
Harrogate
North Yorkshire
HG2 8NB

Attention: Lesley MacCormack

CERTIFICATE OF ANALYSIS

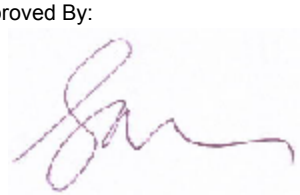
Date:	25 January 2013
Customer:	H_COFFEYGEO_HGT
Sample Delivery Group (SDG):	130116-81
Your Reference:	
Location:	Leachate Analysis
Report No:	209786

We received 14 samples on Wednesday January 16, 2013 and 14 of these samples were scheduled for analysis which was completed on Friday January 25, 2013. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
6779111	SGS383:0004R			
6779112	SGS383:0012R			
6779113	SGS383:0028R			
6779114	SGS383:0040R			
6779115	SGS383:0069R			
6779116	SGS383:0083R			
6779117	SGS383:0124R			
6779119	SGS383:0126R			
6779120	SGS383:0141R			
6779121	SGS383:0142R			
6779123	SGS383:0182R			
6779124	SGS383:0183R			
6779125	SGS383:0184R			
6779126	SGS383:0185R			

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

SOLID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			6779111	SGS383:0004R			BAG
			6779112	SGS383:0012R			BAG
			6779113	SGS383:0028R			BAG
			6779114	SGS383:0040R			BAG
			6779115	SGS383:0069R			BAG
			6779116	SGS383:0083R			BAG
			6779117	SGS383:0124R			BAG
			6779119	SGS383:0126R			BAG
			6779120	SGS383:0141R			BAG
			6779121	SGS383:0142R			BAG
			6779123	SGS383:0182R			BAG
			6779124	SGS383:0183R			BAG
			6779125	SGS383:0184R			BAG
			6779126	SGS383:0185R			BAG
Anions by Kone (w)	All	NDPs: 0 Tests: 14	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CEN 2:1 Readings	All	NDPs: 0 Tests: 14	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CEN 8:1 Readings	All	NDPs: 0 Tests: 14	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 14	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dissolved W, Nb and Zr by ICP-MS	All	NDPs: 0 Tests: 14	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Fluoride	All	NDPs: 0 Tests: 14	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mercury Dissolved	All	NDPs: 0 Tests: 14	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 14	X	X	X	X	X	X	X	X	X	X	X	X	X	X
pH Value of Filtered Water	All	NDPs: 0 Tests: 14	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sample description	All	NDPs: 0 Tests: 13	X	X	X	X	X	X	X	X	X	X	X	X		X
Total Dissolved Solids	All	NDPs: 0 Tests: 14	X	X	X	X	X	X	X	X	X	X	X	X	X	X

CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
6779111	SGS383:0004R		Light Brown	Dry Sample Received	0.1 - 2 mm	Stones	None
6779112	SGS383:0012R		Beige	Dry Sample Received	0.1 - 2 mm	Stones	None
6779113	SGS383:0028R		Grey	Dry Sample Received	0.1 - 2 mm	Stones	Crystalline Material
6779114	SGS383:0040R		Light Brown	N/A	0.1 - 2 mm	Stones	None
6779115	SGS383:0069R		Beige	Dry Sample Received	0.1 - 2 mm	Stones	Crystalline Material
6779116	SGS383:0083R		Light Brown	N/A	0.1 - 2 mm	Stones	None
6779117	SGS383:0124R		Beige	Dry Sample Received	0.1 - 2 mm	Stones	Crystalline Material
6779119	SGS383:0126R		Beige	N/A	2 - 10 mm	Glass & Stones	None
6779120	SGS383:0141R		Beige	N/A	2 - 10 mm	Crystalline Material	Stones
6779121	SGS383:0142R		Beige	Dry Sample Received	0.063 - 0.1 mm	None	None
6779123	SGS383:0182R		Beige	Dry Sample Received	2 - 10 mm	Crystalline Material	Stones
6779124	SGS383:0183R		Beige	Dry Sample Received	2 - 10 mm	Stones	Crystalline Material
6779125	SGS383:0184R		Light Brown	Dry Sample Received	0.063 - 0.1 mm	None	None
6779126	SGS383:0185R		Beige	Dry Sample Received	0.063 - 0.1 mm	None	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.183	**Moisture Content Ratio (%)**	4.88
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	95.4
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779111			
Sampled Date				
Customer Sample Ref.	SGS383:0004R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.00516	0.00517	0.0103	0.0517	0.5	2	25
Barium	0.00222	0.000725	0.00444	0.00964	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	<0.00022	<0.00022	<0.000439	<0.0022	0.5	10	70
Copper	0.0011	<0.00085	0.00219	<0.0085	2	50	100
Mercury Dissolved (CVAF)	0.0000217	<0.00001	0.0000434	<0.0001	0.01	0.2	2
Molybdenum	0.000252	0.000945	0.000503	0.00834	0.5	10	30
Nickel	0.00035	<0.00015	0.000699	<0.0015	0.4	10	40
Lead	0.000358	0.000428	0.000715	0.00417	0.5	10	50
Antimony	0.000414	0.000165	0.000827	0.00205	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	0.0103	0.0013	0.0205	0.0274	4	50	200
Chloride	11.3	<2	22.6	<20	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	62.2	14.3	124	219	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	18-Jan-2013
pH (pH Units)	6.602	7.817
Conductivity (µS/cm)	65.20	15.22
Temperature (°C)	20.00	19.40
Volume Leachant (Litres)	0.341	1.400
Volume of Eluate VE1 (Litres)	0.280	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
25/01/2013 09:37:38

09:37:21 25/01/2013

CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.183	**Moisture Content Ratio (%)**	4.88
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	95.4
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779111			
Sampled Date				
Customer Sample Ref.	SGS383:0004R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.83	6.7	14	67	-	-	-
Aluminium	0.0117	0.0434	0.0233	0.383	-	-	-
Calcium	1.57	0.896	3.13	10	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	4.71	0.36	9.41	10.6	-	-	-
Zirconium	<0.002	<0.002	<0.00399	<0.02	-	-	-
Magnesium	0.183	<0.036	0.365	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	13.4	<2.34	26.8	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.161	<0.019	0.322	0.258	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0402	<0.0094	0.0804	<0.094	-	-	-
Cobalt	0.000163	<0.00006	0.000326	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.00862	0.00204	0.0172	0.0309	-	-	-
Manganese	0.0105	0.000336	0.0209	0.0196	-	-	-
Phosphorus	<0.0063	0.0127	<0.0126	0.107	-	-	-
Strontium	0.00711	0.00441	0.0142	0.0484	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.000719	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	18-Jan-2013
pH (pH Units)	6.602	7.817
Conductivity (µS/cm)	65.20	15.22
Temperature (°C)	20.00	19.40
Volume Leachant (Litres)	0.341	1.400
Volume of Eluate VE1 (Litres)	0.280	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.183	**Moisture Content Ratio (%)**	4.88
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	95.4
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779111			
Sampled Date				
Customer Sample Ref.	SGS383:0004R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	0.00288	<0.003	0.0241	-	-	-
Vanadium	<0.00024	0.000442	<0.000479	0.00371	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	18-Jan-2013
pH (pH Units)	6.602	7.817
Conductivity (µS/cm)	65.20	15.22
Temperature (°C)	20.00	19.40
Volume Leachant (Litres)	0.341	1.400
Volume of Eluate VE1 (Litres)	0.280	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.817
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.2
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779112			
Sampled Date				
Customer Sample Ref.	SGS383:0012R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0102	0.00655	0.0204	0.0717	0.5	2	25
Barium	0.00747	0.000352	0.0149	0.0155	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.00022	<0.00022	0.000441	<0.0022	0.5	10	70
Copper	0.00515	0.000926	0.0103	0.0164	2	50	100
Mercury Dissolved (CVAF)	0.0000204	<0.00001	0.0000409	<0.0001	0.01	0.2	2
Molybdenum	0.00113	0.00111	0.00226	0.0111	0.5	10	30
Nickel	0.000194	<0.00015	0.000389	<0.0015	0.4	10	40
Lead	0.000135	0.000068	0.00027	0.000793	0.5	10	50
Antimony	0.00126	0.000286	0.00253	0.0045	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000781	<0.0039	0.1	0.5	7
Zinc	0.015	0.0017	0.0301	0.0394	4	50	200
Chloride	11.3	<2	22.6	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	450	9.75	901	840	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	18-Jan-2013
pH (pH Units)	6.272	5.741
Conductivity (µS/cm)	88.00	9.20
Temperature (°C)	20.00	17.50
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.295	

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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.817
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.2
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779112			
Sampled Date				
Customer Sample Ref.	SGS383:0012R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.93	6.7	14	68	-	-	-
Aluminium	0.0133	0.0602	0.0266	0.523	-	-	-
Calcium	23.1	0.0917	46.2	39.7	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	28.4	<0.076	56.9	47.9	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	2.43	<0.036	4.87	4.1	-	-	-
Tungsten	0.0309	0.0509	0.0619	0.476	-	-	-
Potassium	2.72	<2.34	5.44	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0363	0.0296	0.0727	0.307	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0342	<0.0094	0.0684	<0.094	-	-	-
Cobalt	0.000267	<0.00006	0.000535	<0.0006	-	-	-
Sulphate (soluble) as S	2.73	<1	5.47	<10	-	-	-
Lithium	0.0152	0.00232	0.0303	0.0449	-	-	-
Manganese	0.00575	0.00141	0.0115	0.0214	-	-	-
Phosphorus	0.0285	0.0108	0.057	0.138	-	-	-
Strontium	0.00645	0.0014	0.0129	0.0225	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.000721	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	18-Jan-2013
pH (pH Units)	6.272	5.741
Conductivity (µS/cm)	88.00	9.20
Temperature (°C)	20.00	17.50
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.295	

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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.817
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.2
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779112			
Sampled Date				
Customer Sample Ref.	SGS383:0012R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	0.00265	<0.003	0.0221	-	-	-
Vanadium	0.000509	<0.00024	0.00102	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	18-Jan-2013
pH (pH Units)	6.272	5.741
Conductivity (µS/cm)	88.00	9.20
Temperature (°C)	20.00	17.50
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.295	

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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.05
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	100
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779113			
Sampled Date				
Customer Sample Ref.	SGS383:0028R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.138	0.075	0.277	0.858	0.5	2	25
Barium	0.00229	0.00122	0.00458	0.014	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000895	0.000327	0.00179	0.00424	0.5	10	70
Copper	0.00537	<0.00085	0.0107	0.00921	2	50	100
Mercury Dissolved (CVAF)	0.0000189	<0.00001	0.0000378	<0.0001	0.01	0.2	2
Molybdenum	0.00254	0.000363	0.00509	0.00736	0.5	10	30
Nickel	0.0005	0.000191	0.001	0.00244	0.4	10	40
Lead	0.000671	0.000074	0.00134	0.00176	0.5	10	50
Antimony	0.000965	0.000174	0.00193	0.0031	0.06	0.7	5
Selenium	0.000481	<0.00039	0.000962	<0.0039	0.1	0.5	7
Zinc	0.00461	0.0023	0.00922	0.027	4	50	200
Chloride	3.8	<2	7.6	<20	800	15000	25000
Fluoride	1.58	<0.5	3.16	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	174	7.54	348	361	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	18-Jan-2013
pH (pH Units)	6.801	5.599
Conductivity (µS/cm)	55.70	10.12
Temperature (°C)	20.40	19.10
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.300	

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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.05
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	100
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779113			
Sampled Date				
Customer Sample Ref.	SGS383:0028R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.39	6.9	15	70	-	-	-
Aluminium	0.412	0.311	0.823	3.28	-	-	-
Calcium	2.47	<0.012	4.95	4.23	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	20.6	<0.076	41.3	35.5	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.725	<0.036	1.45	1.24	-	-	-
Tungsten	0.0166	0.00283	0.0333	0.0519	-	-	-
Potassium	<2.34	<2.34	<4.68	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.544	0.0976	1.09	1.74	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.00125	0.00077	0.0025	0.00852	-	-	-
Boron	0.0848	0.0127	0.17	0.251	-	-	-
Cobalt	0.000233	<0.00006	0.000466	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.14	0.0149	0.279	0.364	-	-	-
Manganese	0.00391	0.00562	0.00783	0.0533	-	-	-
Phosphorus	0.029	0.024	0.058	0.248	-	-	-
Strontium	0.00556	0.000629	0.0111	0.0147	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	0.000438	<0.00036	0.000876	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	18-Jan-2013
pH (pH Units)	6.801	5.599
Conductivity (µS/cm)	55.70	10.12
Temperature (°C)	20.40	19.10
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.300	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.05
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	100
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779113			
Sampled Date				
Customer Sample Ref.	SGS383:0028R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.011	0.00673	0.0221	0.0746	-	-	-
Vanadium	0.0024	0.00127	0.0048	0.0147	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	18-Jan-2013
pH (pH Units)	6.801	5.599
Conductivity (µS/cm)	55.70	10.12
Temperature (°C)	20.40	19.10
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.300	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.191	**Moisture Content Ratio (%)**	9.03
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	91.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779114			
Sampled Date				
Customer Sample Ref.	SGS383:0040R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.134	0.0282	0.268	0.292	0.5	2	25
Barium	0.00169	0.00103	0.00337	0.0103	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000522	<0.00022	0.00104	<0.0022	0.5	10	70
Copper	0.0301	0.00627	0.0601	0.065	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00371	0.000402	0.00742	0.00434	0.5	10	30
Nickel	0.000805	<0.00015	0.00161	<0.0015	0.4	10	40
Lead	0.00164	0.000471	0.00327	0.00482	0.5	10	50
Antimony	0.00278	0.00045	0.00555	0.00472	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.00078	<0.0039	0.1	0.5	7
Zinc	0.00387	0.00228	0.00774	0.0229	4	50	200
Chloride	4.8	<2	9.59	<20	800	15000	25000
Fluoride	3.97	0.792	7.94	8.23	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	79.2	10.3	158	110	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	7.974	8.574
Conductivity (µS/cm)	97.40	12.06
Temperature (°C)	19.50	18.30
Volume Leachant (Litres)	0.334	1.400
Volume of Eluate VE1 (Litres)	0.017	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.191	**Moisture Content Ratio (%)**	9.03
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	91.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779114			
Sampled Date				
Customer Sample Ref.	SGS383:0040R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.43	6.8	15	68	-	-	-
Aluminium	1	0.202	2.01	2.1	-	-	-
Calcium	1.65	<0.012	3.29	0.159	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	15.4	0.854	30.7	9.94	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.142	<0.036	0.283	<0.36	-	-	-
Tungsten	0.991	0.116	1.98	1.24	-	-	-
Potassium	11.6	<2.34	23.1	<23.4	-	-	-
Beryllium	0.000117	<0.00007	0.000234	<0.0007	-	-	-
Iron	0.316	0.0777	0.631	0.8	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.000458	<0.00016	0.000916	<0.0016	-	-	-
Boron	0.0411	0.011	0.0822	0.112	-	-	-
Cobalt	0.000964	0.000128	0.00193	0.00136	-	-	-
Sulphate (soluble) as S	3.87	<1	7.73	<10	-	-	-
Lithium	0.0176	0.00355	0.0352	0.0368	-	-	-
Manganese	0.00143	0.000859	0.00285	0.00864	-	-	-
Phosphorus	0.427	0.111	0.854	1.14	-	-	-
Strontium	0.00328	0.000199	0.00656	0.00229	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	0.000399	<0.00036	0.000798	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	7.974	8.574
Conductivity (µS/cm)	97.40	12.06
Temperature (°C)	19.50	18.30
Volume Leachant (Litres)	0.334	1.400
Volume of Eluate VE1 (Litres)	0.017	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.191	**Moisture Content Ratio (%)**	9.03
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	91.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779114			
Sampled Date				
Customer Sample Ref.	SGS383:0040R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00627	0.00162	0.0125	0.0166	-	-	-
Vanadium	0.001	0.000302	0.002	0.00309	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	7.974	8.574
Conductivity (µS/cm)	97.40	12.06
Temperature (°C)	19.50	18.30
Volume Leachant (Litres)	0.334	1.400
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.15
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779115			
Sampled Date				
Customer Sample Ref.	SGS383:0069R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0681	0.0266	0.136	0.319	0.5	2	25
Barium	0.00185	0.000842	0.00371	0.00969	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000329	<0.00022	0.000659	<0.0022	0.5	10	70
Copper	0.0139	0.00191	0.0278	0.0342	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00659	0.000805	0.0132	0.0153	0.5	10	30
Nickel	0.000299	0.000162	0.000598	0.00179	0.4	10	40
Lead	0.000194	0.000046	0.000388	0.000646	0.5	10	50
Antimony	0.00206	0.000375	0.00412	0.00587	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000781	<0.0039	0.1	0.5	7
Zinc	0.00241	0.000803	0.00483	0.0101	4	50	200
Chloride	3	<2	6	<20	800	15000	25000
Fluoride	1.89	<0.5	3.79	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	44.6	7.38	89.3	121	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	7.830	7.860
Conductivity (µS/cm)	55.40	6.16
Temperature (°C)	19.00	18.50
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.220	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
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09:37:21 25/01/2013

CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.15
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779115			
Sampled Date				
Customer Sample Ref.	SGS383:0069R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.11	6.9	14	69	-	-	-
Aluminium	0.369	0.321	0.738	3.27	-	-	-
Calcium	0.729	0.0782	1.46	1.6	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	1.9	<0.076	3.8	2.39	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.157	<0.036	0.313	<0.36	-	-	-
Tungsten	0.26	0.0365	0.52	0.646	-	-	-
Potassium	13.8	<2.34	27.5	<23.4	-	-	-
Beryllium	0.00007	<0.00007	0.00014	<0.0007	-	-	-
Iron	0.301	0.143	0.603	1.63	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.000293	<0.00016	0.000586	<0.0016	-	-	-
Boron	0.0226	<0.0094	0.0451	<0.094	-	-	-
Cobalt	0.000227	<0.00006	0.000454	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.132	0.019	0.264	0.332	-	-	-
Manganese	0.00837	0.00119	0.0168	0.021	-	-	-
Phosphorus	0.0323	0.0168	0.0647	0.188	-	-	-
Strontium	0.00294	0.00117	0.00589	0.0139	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	0.00106	0.000554	0.00213	0.00618	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	7.830	7.860
Conductivity (µS/cm)	55.40	6.16
Temperature (°C)	19.00	18.50
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.220	

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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.15
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130116-81			
Lab Sample Number(s)	6779115			
Sampled Date				
Customer Sample Ref.	SGS383:0069R	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Depth (m)				
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		**mg/kg**				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00352	0.00227	0.00705	0.0243	-	-	-
Vanadium	0.000387	0.000389	0.000775	0.00389	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	7.830	7.860
Conductivity (µS/cm)	55.40	6.16
Temperature (°C)	19.00	18.50
Volume Leachant (Litres)	0.350	1.400
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.452
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779116			
Sampled Date				
Customer Sample Ref.	SGS383:0083R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0215	0.0304	0.043	0.292	0.5	2	25
Barium	0.000878	0.00178	0.00176	0.0166	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.00106	0.000735	0.00213	0.0078	0.5	10	70
Copper	0.0109	0.00253	0.0217	0.037	2	50	100
Mercury Dissolved (CVAF)	0.000012	<0.00001	0.0000239	<0.0001	0.01	0.2	2
Molybdenum	0.000436	0.000878	0.000872	0.00816	0.5	10	30
Nickel	0.000311	0.000266	0.000622	0.00272	0.4	10	40
Lead	0.000257	0.000057	0.000514	0.00085	0.5	10	50
Antimony	0.00205	0.000852	0.00409	0.0102	0.06	0.7	5
Selenium	0.000678	<0.00039	0.00136	<0.0039	0.1	0.5	7
Zinc	0.0045	0.00165	0.00899	0.0205	4	50	200
Chloride	15.5	<2	31	21.7	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	74.2	17.1	148	250	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	6.832	7.805
Conductivity (µS/cm)	89.40	10.54
Temperature (°C)	20.50	17.50
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.245	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.452
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779116			
Sampled Date				
Customer Sample Ref.	SGS383:0083R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.47	7	13	69	-	-	-
Aluminium	0.283	0.2	0.566	2.11	-	-	-
Calcium	<0.012	0.352	<0.024	3.03	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	14.5	0.78	28.9	27	-	-	-
Zirconium	0.00553	0.00294	0.0111	0.033	-	-	-
Magnesium	0.0837	0.0374	0.167	0.439	-	-	-
Tungsten	0.00466	0.0141	0.00932	0.128	-	-	-
Potassium	3.52	<2.34	7.03	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.141	0.106	0.282	1.11	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0389	0.0148	0.0778	0.182	-	-	-
Cobalt	0.000433	0.000121	0.000866	0.00165	-	-	-
Sulphate (soluble) as S	3.77	<1	7.53	<10	-	-	-
Lithium	0.00384	<0.00192	0.00767	<0.0192	-	-	-
Manganese	0.00185	0.0118	0.0037	0.104	-	-	-
Phosphorus	0.0221	0.0158	0.0442	0.167	-	-	-
Strontium	0.00108	0.00219	0.00215	0.0204	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	0.000423	<0.00036	0.000846	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	6.832	7.805
Conductivity (µS/cm)	89.40	10.54
Temperature (°C)	20.50	17.50
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.245	

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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.452
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779116			
Sampled Date				
Customer Sample Ref.	SGS383:0083R			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00753	0.00576	0.0151	0.0601	-	-	-
Vanadium	0.000449	0.0011	0.000898	0.0101	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	6.832	7.805
Conductivity (µS/cm)	89.40	10.54
Temperature (°C)	20.50	17.50
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.245	

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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.472
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.5
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779117			
Sampled Date				
Customer Sample Ref.	SGS383:0124R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0524	0.0531	0.105	0.53	0.5	2	25
Barium	0.00238	0.000572	0.00477	0.00841	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000342	<0.00022	0.000684	<0.0022	0.5	10	70
Copper	0.0364	0.00456	0.0728	0.0929	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.0141	0.00144	0.0282	0.0332	0.5	10	30
Nickel	0.00204	0.000269	0.00407	0.00532	0.4	10	40
Lead	0.000222	0.000152	0.000444	0.00162	0.5	10	50
Antimony	0.00857	0.00127	0.0171	0.0236	0.06	0.7	5
Selenium	0.00948	<0.00039	0.019	0.0141	0.1	0.5	7
Zinc	0.00314	0.00292	0.00628	0.0295	4	50	200
Chloride	14.9	<2	29.8	22.1	800	15000	25000
Fluoride	1.29	<0.5	2.57	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	91.7	11.7	183	236	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	7.686	8.139
Conductivity (µS/cm)	109.80	11.29
Temperature (°C)	19.00	18.60
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.260	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.472
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.5
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779117			
Sampled Date				
Customer Sample Ref.	SGS383:0124R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.15	6.8	14	69	-	-	-
Aluminium	0.163	0.13	0.325	1.35	-	-	-
Calcium	2.78	<0.012	5.56	4.13	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	10.7	<0.076	21.5	15.9	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	1.52	0.1	3.04	3.11	-	-	-
Tungsten	0.0414	0.00704	0.0827	0.121	-	-	-
Potassium	13.4	<2.34	26.7	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0626	0.0348	0.125	0.389	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.000194	<0.00016	0.000388	<0.0016	-	-	-
Boron	0.0796	0.0125	0.159	0.225	-	-	-
Cobalt	0.00179	0.000172	0.00358	0.00412	-	-	-
Sulphate (soluble) as S	3.6	<1	7.2	<10	-	-	-
Lithium	0.0518	0.00626	0.104	0.13	-	-	-
Manganese	0.0198	0.00169	0.0396	0.0438	-	-	-
Phosphorus	0.0339	0.0421	0.0678	0.409	-	-	-
Strontium	0.00773	0.000614	0.0154	0.0167	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.00072	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	7.686	8.139
Conductivity (µS/cm)	109.80	11.29
Temperature (°C)	19.00	18.60
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.260	

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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.472
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.5
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779117			
Sampled Date				
Customer Sample Ref.	SGS383:0124R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00231	0.00153	0.00462	0.0164	-	-	-
Vanadium	0.000484	0.000305	0.000968	0.00332	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	7.686	8.139
Conductivity (µS/cm)	109.80	11.29
Temperature (°C)	19.00	18.60
Volume Leachant (Litres)	0.349	1.400
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.949
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.1
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779119			
Sampled Date				
Customer Sample Ref.	SGS383:0126R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0119	0.0478	0.0238	0.422	0.5	2	25
Barium	0.0183	0.000954	0.0366	0.0363	20	100	300
Cadmium	0.000936	0.000126	0.00187	0.00251	0.04	1	5
Chromium	<0.00022	<0.00022	<0.00044	<0.0022	0.5	10	70
Copper	1.46	0.258	2.92	4.43	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00172	0.000734	0.00344	0.00886	0.5	10	30
Nickel	0.0828	0.00938	0.165	0.207	0.4	10	40
Lead	0.000247	0.000105	0.000494	0.00127	0.5	10	50
Antimony	0.00927	0.00404	0.0185	0.0485	0.06	0.7	5
Selenium	0.0323	0.00184	0.0645	0.0654	0.1	0.5	7
Zinc	0.153	0.0216	0.305	0.419	4	50	200
Chloride	6.3	<2	12.6	<20	800	15000	25000
Fluoride	4.27	1.78	8.54	21.6	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	221	26.2	442	562	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	6.326	8.419
Conductivity (µS/cm)	282.00	29.40
Temperature (°C)	20.10	18.80
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.270	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.949
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.1
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779119			
Sampled Date				
Customer Sample Ref.	SGS383:0126R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	5.89	6.2	12	61	-	-	-
Aluminium	0.918	0.0956	1.83	2.22	-	-	-
Calcium	13.7	1.31	27.3	32.2	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	8.55	<0.076	17.1	13.2	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	8.64	0.974	17.3	21.6	-	-	-
Tungsten	0.00409	0.00252	0.00817	0.0276	-	-	-
Potassium	25	2.97	50	63.7	-	-	-
Beryllium	0.000689	0.000093	0.00138	0.00185	-	-	-
Iron	<0.019	<0.019	<0.038	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0622	0.0148	0.124	0.221	-	-	-
Cobalt	0.347	0.0383	0.693	0.859	-	-	-
Sulphate (soluble) as S	35	1.87	69.9	69.8	-	-	-
Lithium	0.175	0.0196	0.35	0.436	-	-	-
Manganese	0.226	0.027	0.451	0.577	-	-	-
Phosphorus	0.0223	0.0109	0.0445	0.126	-	-	-
Strontium	0.0369	0.00231	0.0737	0.0765	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	0.000489	<0.00036	0.000977	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	6.326	8.419
Conductivity (µS/cm)	282.00	29.40
Temperature (°C)	20.10	18.80
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.270	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.949
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.1
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779119			
Sampled Date				
Customer Sample Ref.	SGS383:0126R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	<0.00024	<0.00024	<0.00048	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	6.326	8.419
Conductivity (µS/cm)	282.00	29.40
Temperature (°C)	20.10	18.80
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.270	

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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.381
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779120			
Sampled Date				
Customer Sample Ref.	SGS383:0141R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0629	0.04	0.126	0.436	0.5	2	25
Barium	0.00236	0.00246	0.00472	0.0244	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000622	0.00026	0.00124	0.00318	0.5	10	70
Copper	0.00474	0.00144	0.00947	0.0197	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00183	<0.00024	0.00365	0.00293	0.5	10	30
Nickel	0.000298	<0.00015	0.000595	<0.0015	0.4	10	40
Lead	0.000425	0.00393	0.000849	0.0337	0.5	10	50
Antimony	0.00312	0.000797	0.00624	0.0117	0.06	0.7	5
Selenium	0.000665	<0.00039	0.00133	<0.0039	0.1	0.5	7
Zinc	0.00211	0.00297	0.00422	0.0283	4	50	200
Chloride	2.9	<2	5.79	<20	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	44.5	20.9	88.9	247	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	7.233	8.997
Conductivity (µS/cm)	54.90	21.40
Temperature (°C)	20.20	18.50
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.280	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.381
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779120			
Sampled Date				
Customer Sample Ref.	SGS383:0141R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.35	7.7	15	76	-	-	-
Aluminium	0.17	0.255	0.339	2.41	-	-	-
Calcium	8.39	4.15	16.8	48.3	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	2.69	<0.076	5.37	4.3	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.507	0.126	1.01	1.87	-	-	-
Tungsten	0.492	0.139	0.984	1.95	-	-	-
Potassium	<2.34	<2.34	<4.68	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0912	0.0695	0.182	0.73	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.000241	0.000197	0.000482	0.00204	-	-	-
Boron	0.00971	<0.0094	0.0194	<0.094	-	-	-
Cobalt	0.000072	<0.00006	0.000144	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	<0.00192	<0.00192	<0.00384	<0.0192	-	-	-
Manganese	0.00432	0.00088	0.00862	0.0143	-	-	-
Phosphorus	0.0233	0.00871	0.0466	0.11	-	-	-
Strontium	0.0153	0.00361	0.0306	0.0548	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	0.000376	<0.00036	0.000751	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	7.233	8.997
Conductivity (µS/cm)	54.90	21.40
Temperature (°C)	20.20	18.50
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.280	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.381
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779120			
Sampled Date				
Customer Sample Ref.	SGS383:0141R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00153	<0.0015	0.00306	<0.015	-	-	-
Vanadium	0.000838	0.000558	0.00167	0.00603	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	7.233	8.997
Conductivity (µS/cm)	54.90	21.40
Temperature (°C)	20.20	18.50
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.280	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.513
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.5
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779121			
Sampled Date				
Customer Sample Ref.	SGS383:0142R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.105	0.143	0.209	1.38	0.5	2	25
Barium	0.00741	0.00078	0.0148	0.0176	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.00247	0.000835	0.00494	0.0108	0.5	10	70
Copper	0.0365	0.01	0.0729	0.14	2	50	100
Mercury Dissolved (CVAF)	0.0000111	<0.00001	0.0000222	<0.0001	0.01	0.2	2
Molybdenum	0.00852	0.00169	0.017	0.0271	0.5	10	30
Nickel	0.000664	0.000314	0.00133	0.00366	0.4	10	40
Lead	0.000107	0.000747	0.000214	0.00652	0.5	10	50
Antimony	0.00572	0.00313	0.0114	0.0351	0.06	0.7	5
Selenium	0.00244	0.000437	0.00487	0.00735	0.1	0.5	7
Zinc	0.00935	0.00159	0.0187	0.0274	4	50	200
Chloride	37.6	2.5	75.2	77.1	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	181	50	361	695	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	18-Jan-2013
pH (pH Units)	6.928	7.625
Conductivity (µS/cm)	230.00	59.60
Temperature (°C)	20.10	19.66
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.260	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.513
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.5
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779121			
Sampled Date				
Customer Sample Ref.	SGS383:0142R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.44	7.6	15	75	-	-	-
Aluminium	0.04	0.26	0.08	2.28	-	-	-
Calcium	1.27	10.5	2.54	91.6	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	8.37	2.57	16.7	34.3	-	-	-
Zirconium	0.00263	<0.002	0.00526	<0.02	-	-	-
Magnesium	0.295	0.648	0.59	5.96	-	-	-
Tungsten	4.13	1.35	8.25	17.6	-	-	-
Potassium	3.36	<2.34	6.71	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	<0.019	0.171	<0.038	1.45	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.00021	0.00133	0.00042	0.0116	-	-	-
Boron	0.0242	<0.0094	0.0483	<0.094	-	-	-
Cobalt	0.000317	<0.00006	0.000634	<0.0006	-	-	-
Sulphate (soluble) as S	2.27	<1	4.53	<10	-	-	-
Lithium	<0.00192	<0.00192	<0.00384	<0.0192	-	-	-
Manganese	0.0256	0.00233	0.0512	0.0578	-	-	-
Phosphorus	0.0617	0.0431	0.123	0.458	-	-	-
Strontium	0.033	0.00653	0.0659	0.105	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.00072	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	18-Jan-2013
pH (pH Units)	6.928	7.625
Conductivity (µS/cm)	230.00	59.60
Temperature (°C)	20.10	19.66
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.260	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.513
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.5
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779121			
Sampled Date				
Customer Sample Ref.	SGS383:0142R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	0.00205	<0.0015	0.0041	<0.015	-	-	-
Titanium	<0.0015	0.00167	<0.003	<0.015	-	-	-
Vanadium	0.000309	0.00117	0.000618	0.0104	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	18-Jan-2013
pH (pH Units)	6.928	7.625
Conductivity (µS/cm)	230.00	59.60
Temperature (°C)	20.10	19.66
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.260	

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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.675
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.3
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779123			
Sampled Date				
Customer Sample Ref.	SGS383:0182R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0158	0.0131	0.0316	0.135	0.5	2	25
Barium	0.00181	0.000295	0.00362	0.00529	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000292	<0.00022	0.000584	<0.0022	0.5	10	70
Copper	0.00253	<0.00085	0.00505	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00803	0.00196	0.0161	0.0289	0.5	10	30
Nickel	0.000332	<0.00015	0.000664	<0.0015	0.4	10	40
Lead	0.000209	0.000105	0.000418	0.00121	0.5	10	50
Antimony	0.0069	0.000218	0.0138	0.0125	0.06	0.7	5
Selenium	0.000953	<0.00039	0.00191	<0.0039	0.1	0.5	7
Zinc	0.00173	0.0014	0.00346	0.0145	4	50	200
Chloride	4.5	<2	9	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	25.7	<5	51.4	<50	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	5.381	9.470
Conductivity (µS/cm)	31.60	6.47
Temperature (°C)	19.50	18.70
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.270	

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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.675
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.3
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779123			
Sampled Date				
Customer Sample Ref.	SGS383:0182R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.67	6.6	13	66	-	-	-
Aluminium	0.0921	0.0685	0.184	0.722	-	-	-
Calcium	0.493	<0.012	0.986	0.761	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	3.57	<0.076	7.14	5.51	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.23	<0.036	0.46	<0.36	-	-	-
Tungsten	0.111	0.0582	0.221	0.663	-	-	-
Potassium	<2.34	<2.34	<4.68	<23.4	-	-	-
Beryllium	0.000091	<0.00007	0.000182	<0.0007	-	-	-
Iron	0.0389	<0.019	0.0778	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0134	<0.0094	0.0269	<0.094	-	-	-
Cobalt	0.000106	<0.00006	0.000212	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.00246	<0.00192	0.00492	<0.0192	-	-	-
Manganese	0.00724	0.000893	0.0145	0.0187	-	-	-
Phosphorus	0.0326	0.0126	0.0653	0.157	-	-	-
Strontium	0.00517	0.000967	0.0103	0.0162	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	0.0016	<0.00036	0.0032	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	5.381	9.470
Conductivity (µS/cm)	31.60	6.47
Temperature (°C)	19.50	18.70
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.270	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.675
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.3
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779123			
Sampled Date				
Customer Sample Ref.	SGS383:0182R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00151	<0.0015	0.00302	<0.015	-	-	-
Vanadium	0.000395	0.000273	0.00079	0.00292	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	5.381	9.470
Conductivity (µS/cm)	31.60	6.47
Temperature (°C)	19.50	18.70
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.270	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.231
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779124			
Sampled Date				
Customer Sample Ref.	SGS383:0183R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.00312	0.00235	0.00624	0.0247	0.5	2	25
Barium	0.00148	0.000955	0.00296	0.0104	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	<0.00022	<0.00022	<0.000441	<0.0022	0.5	10	70
Copper	0.00176	<0.00085	0.00353	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00184	0.000626	0.00369	0.00824	0.5	10	30
Nickel	0.000189	<0.00015	0.000378	<0.0015	0.4	10	40
Lead	0.000113	<0.00002	0.000226	<0.0002	0.5	10	50
Antimony	0.000783	0.000169	0.00157	0.00269	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000781	<0.0039	0.1	0.5	7
Zinc	0.00914	0.000978	0.0183	0.0231	4	50	200
Chloride	3.3	<2	6.61	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	19.9	9.33	39.9	111	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	6.773	8.436
Conductivity (µS/cm)	22.30	3.88
Temperature (°C)	20.20	18.90
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.285	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.231
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779124			
Sampled Date				
Customer Sample Ref.	SGS383:0183R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.84	7.2	14	71	-	-	-
Aluminium	0.0592	0.051	0.118	0.523	-	-	-
Calcium	1.3	1.79	2.6	17.1	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	2.52	<0.076	5.04	4.1	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.0842	<0.036	0.169	<0.36	-	-	-
Tungsten	0.054	0.0356	0.108	0.386	-	-	-
Potassium	<2.34	<2.34	<4.69	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0267	<0.019	0.0535	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	<0.0094	<0.0094	<0.0188	<0.094	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	<0.00192	<0.00192	<0.00384	<0.0192	-	-	-
Manganese	0.00746	0.00177	0.0149	0.027	-	-	-
Phosphorus	0.0235	<0.0063	0.047	<0.063	-	-	-
Strontium	0.00418	0.00173	0.00836	0.0213	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.000721	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	6.773	8.436
Conductivity (µS/cm)	22.30	3.88
Temperature (°C)	20.20	18.90
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.285	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.231
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779124			
Sampled Date				
Customer Sample Ref.	SGS383:0183R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	0.000281	<0.00024	0.000563	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	6.773	8.436
Conductivity (µS/cm)	22.30	3.88
Temperature (°C)	20.20	18.90
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.285	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.321
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779125			
Sampled Date				
Customer Sample Ref.	SGS383:0184R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.948	0.385	1.89	4.55	0.5	2	25
Barium	0.00282	0.00321	0.00563	0.0316	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000562	0.000362	0.00112	0.00387	0.5	10	70
Copper	0.012	0.00506	0.024	0.0593	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00842	0.00105	0.0168	0.0198	0.5	10	30
Nickel	0.000566	0.000343	0.00113	0.00371	0.4	10	40
Lead	0.000637	0.0002	0.00127	0.00255	0.5	10	50
Antimony	0.118	0.0296	0.235	0.407	0.06	0.7	5
Selenium	0.00344	0.000425	0.00687	0.00804	0.1	0.5	7
Zinc	0.00216	0.00216	0.00432	0.0216	4	50	200
Chloride	15.6	<2	31.2	<20	800	15000	25000
Fluoride	0.849	<0.5	1.7	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	78.7	10.2	157	188	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	7.166	8.788
Conductivity (µS/cm)	86.90	11.55
Temperature (°C)	20.90	18.50
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.220	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.321
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779125			
Sampled Date				
Customer Sample Ref.	SGS383:0184R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.21	6.7	14	68	-	-	-
Aluminium	0.138	0.162	0.276	1.59	-	-	-
Calcium	4.52	<0.012	9.03	5.68	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	14.4	0.295	28.7	20.7	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.878	0.184	1.75	2.71	-	-	-
Tungsten	0.807	0.189	1.61	2.67	-	-	-
Potassium	<2.34	<2.34	<4.67	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.111	0.133	0.222	1.3	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.000335	0.00048	0.000669	0.00462	-	-	-
Boron	0.0202	<0.0094	0.0403	<0.094	-	-	-
Cobalt	0.000175	0.000114	0.00035	0.00122	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.00553	0.00248	0.011	0.0286	-	-	-
Manganese	0.0149	0.00335	0.0297	0.048	-	-	-
Phosphorus	0.172	0.0904	0.343	1.01	-	-	-
Strontium	0.0186	0.00192	0.0372	0.0402	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	0.000773	<0.00036	0.00154	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	7.166	8.788
Conductivity (µS/cm)	86.90	11.55
Temperature (°C)	20.90	18.50
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.220	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.321
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779125			
Sampled Date				
Customer Sample Ref.	SGS383:0184R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00223	<0.0015	0.00445	<0.015	-	-	-
Vanadium	0.00109	0.000499	0.00217	0.00573	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	21-Jan-2013
pH (pH Units)	7.166	8.788
Conductivity (µS/cm)	86.90	11.55
Temperature (°C)	20.90	18.50
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.220	

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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.878
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.1
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779126			
Sampled Date				
Customer Sample Ref.	SGS383:0185R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.18	0.102	0.36	1.14	0.5	2	25
Barium	0.0063	0.0021	0.0126	0.0275	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.00136	0.000254	0.00272	0.00425	0.5	10	70
Copper	0.015	0.00317	0.0299	0.05	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00707	0.000934	0.0141	0.0188	0.5	10	30
Nickel	0.00124	0.000237	0.00248	0.00392	0.4	10	40
Lead	0.000962	0.0003	0.00192	0.00402	0.5	10	50
Antimony	0.0562	0.0168	0.112	0.228	0.06	0.7	5
Selenium	0.000444	<0.00039	0.000887	<0.0039	0.1	0.5	7
Zinc	0.0077	0.00328	0.0154	0.0396	4	50	200
Chloride	19.7	<2	39.3	30.4	800	15000	25000
Fluoride	0.993	<0.5	1.98	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	88.1	12.5	176	242	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	18-Jan-2013
pH (pH Units)	7.804	7.161
Conductivity (µS/cm)	107.10	12.38
Temperature (°C)	20.00	19.60
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.270	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.878
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.1
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779126			
Sampled Date				
Customer Sample Ref.	SGS383:0185R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.2	6.9	14	69	-	-	-
Aluminium	0.34	0.171	0.679	1.97	-	-	-
Calcium	<0.012	0.355	<0.024	3	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	<0.076	1.25	<0.152	10.6	-	-	-
Zirconium	<0.002	<0.002	<0.00399	<0.02	-	-	-
Magnesium	<0.036	0.128	<0.0719	1.09	-	-	-
Tungsten	1.37	0.393	2.74	5.44	-	-	-
Potassium	<2.34	<2.34	<4.67	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	<0.019	0.0816	<0.0379	0.69	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.00214	0.000244	0.00428	0.00536	-	-	-
Boron	0.0331	<0.0094	0.0662	<0.094	-	-	-
Cobalt	0.000216	<0.00006	0.000431	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	<0.00192	<0.00192	<0.00383	<0.0192	-	-	-
Manganese	0.0112	0.00142	0.0224	0.0293	-	-	-
Phosphorus	0.0899	0.0327	0.18	0.416	-	-	-
Strontium	0.0159	0.00287	0.0317	0.0488	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	0.000522	<0.00036	0.00104	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	18-Jan-2013
pH (pH Units)	7.804	7.161
Conductivity (µS/cm)	107.10	12.38
Temperature (°C)	20.00	19.60
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.270	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.878
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.1
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130116-81			
Lab Sample Number(s)	6779126			
Sampled Date				
Customer Sample Ref.	SGS383:0185R			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00384	0.00221	0.00767	0.0246	-	-	-
Vanadium	0.00108	0.000495	0.00216	0.00585	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Jan-2013	18-Jan-2013
pH (pH Units)	7.804	7.161
Conductivity (µS/cm)	107.10	12.38
Temperature (°C)	20.00	19.60
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.270	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
25/01/2013 09:37:38

09:37:21 25/01/2013

CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM114		Leaching Procedure for CEN Two Stage BatchTest 2:1/8:1 Cumulative		
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM283		Determination of Dissolved Niobium, Tungsten, and Zirconium in Water Matrices by ICP-MS		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	6779111	6779112	6779113	6779114	6779115	6779116	6779117	6779119	6779120	6779121
Customer Sample Ref.	SGS383:0004R	SGS383:0012R	SGS383:0028R	SGS383:0040R	SGS383:0069R	SGS383:0083R	SGS383:0124R	SGS383:0126R	SGS383:0141R	SGS383:0142R
AGS Ref.										
Depth										
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Anions by Kone (w)	23-Jan-2013	23-Jan-2013	23-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013
CEN 2:1 Leachate (2 Stage)	18-Jan-2013	18-Jan-2013	18-Jan-2013	18-Jan-2013	18-Jan-2013	18-Jan-2013	18-Jan-2013	18-Jan-2013	18-Jan-2013	18-Jan-2013
CEN 2:1 Readings	22-Jan-2013	22-Jan-2013	22-Jan-2013	22-Jan-2013	22-Jan-2013	23-Jan-2013	22-Jan-2013	23-Jan-2013	23-Jan-2013	22-Jan-2013
CEN 8:1 Leachate (2 Stage)	22-Jan-2013	22-Jan-2013	22-Jan-2013	22-Jan-2013	22-Jan-2013	23-Jan-2013	22-Jan-2013	23-Jan-2013	23-Jan-2013	22-Jan-2013
CEN 8:1 Readings	23-Jan-2013	23-Jan-2013	23-Jan-2013	23-Jan-2013	23-Jan-2013	23-Jan-2013	23-Jan-2013	23-Jan-2013	23-Jan-2013	23-Jan-2013
Dissolved Metals by ICP-MS	24-Jan-2013	24-Jan-2013	24-Jan-2013	25-Jan-2013	25-Jan-2013	25-Jan-2013	25-Jan-2013	25-Jan-2013	25-Jan-2013	24-Jan-2013
Dissolved W, Nb and Zr by ICP-MS	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013
Fluoride	23-Jan-2013	23-Jan-2013	23-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	23-Jan-2013
Mercury Dissolved	23-Jan-2013	23-Jan-2013	23-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013
Metals by iCap-OES Dissolved (W)	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013
pH Value of Filtered Water	23-Jan-2013	23-Jan-2013	23-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	23-Jan-2013
Sample description	22-Jan-2013	22-Jan-2013	22-Jan-2013	22-Jan-2013	22-Jan-2013	22-Jan-2013	22-Jan-2013	22-Jan-2013	22-Jan-2013	22-Jan-2013
Total Dissolved Solids	23-Jan-2013	23-Jan-2013	23-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013	23-Jan-2013

Lab Sample No(s)	6779123	6779124	6779125	6779126
Customer Sample Ref.	SGS383:0182R	SGS383:0183R	SGS383:0184R	SGS383:0185R
AGS Ref.				
Depth				
Type	SOLID	SOLID	SOLID	SOLID
Anions by Kone (w)	24-Jan-2013	24-Jan-2013	24-Jan-2013	23-Jan-2013
CEN 2:1 Leachate (2 Stage)	18-Jan-2013	18-Jan-2013	18-Jan-2013	18-Jan-2013
CEN 2:1 Readings	22-Jan-2013	23-Jan-2013	23-Jan-2013	22-Jan-2013
CEN 8:1 Leachate (2 Stage)	22-Jan-2013	23-Jan-2013	23-Jan-2013	22-Jan-2013
CEN 8:1 Readings	23-Jan-2013	23-Jan-2013	23-Jan-2013	23-Jan-2013
Dissolved Metals by ICP-MS	25-Jan-2013	25-Jan-2013	25-Jan-2013	24-Jan-2013
Dissolved W, Nb and Zr by ICP-MS	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013
Fluoride	24-Jan-2013	24-Jan-2013	24-Jan-2013	23-Jan-2013
Mercury Dissolved	24-Jan-2013	24-Jan-2013	24-Jan-2013	23-Jan-2013
Metals by iCap-OES Dissolved (W)	24-Jan-2013	24-Jan-2013	24-Jan-2013	24-Jan-2013
pH Value of Filtered Water	24-Jan-2013	24-Jan-2013	24-Jan-2013	23-Jan-2013
Sample description	22-Jan-2013	22-Jan-2013	22-Jan-2013	22-Jan-2013
Total Dissolved Solids	24-Jan-2013	24-Jan-2013	24-Jan-2013	23-Jan-2013

SDG:	130116-81	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	209786
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -
Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

APPENDIX 3C-10

Factual report from CEN TS 14429 Testing (Phase I)

Chemtest Technical Services
Depot Road
Newmarket
Suffolk
CB8 0AL

FAO S Fisher/J Cutting/ P Hellier

LABORATORY TEST REPORT

Results of analysis of 90 samples
received 4 February 2013

A26086 - pH dependence, Coffey Geotechnic

Chemtest
The right chemistry to deliver results

Report Date
11 February 2013

Login Batch No						**221743**					
Chemtest LIMS ID						AI23204	AI23205	AI23206	AI23207	AI23208	AI23209
Sample ID						SGS383:0141R	SGS383:0141R	SGS383:0141R	SGS383:0141R	SGS383:0141R	SGS383:0141R
Sample No						E	L	J	C	K	I
Sampling Date						Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Depth											
Matrix						*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
SOP↓	Determinand↓	CAS No↓	Units↓	*							
1010	pH	PH		U		9.608	8.705	8.523	10.987	9.051	7.468
1020	Electrical Conductivity	EC	µS cm-¹	U		138	118	213	347	113.6	1179
1040	Total Dissolved Solids	TDS	mg l-¹	N		90	77	138	226	74	766
1170	Redox potential	EH	mV	N		208	198	142.5	101.3	134	175.5
1180	Sulfur (total)	7704349	mg l-¹	N		<1	<1	<1	<1	<1	<1
1220	Alkalinity	ALK	mg CaCO3 l-¹	U		51	34	58	150	47	160
	Chloride	16887006	mg l-¹	U		14	10	16	22	8.8	240
	Fluoride	16984488	mg l-¹	U		0.63	0.60	0.53	0.60	0.53	0.45
1610	Dissolved Organic Carbon	DOC	mg l-¹	N		<2.5	< 2.5	< 2.5	21	< 2.5	16
6030	Silver	7440224	µg l-¹	N		14	3.9	1.8	0.57	<0.50	<0.50
	Aluminium	7429905	µg l-¹	N		3650	1090	220	8200	4100	370
	Gold	7440575	µg l-¹	N		6.0	1.4	<1.0	5.0	5.2	2.7
	Arsenic	7440382	µg l-¹	U		1600	375	98	2600	285	19
	Barium	7440393	µg l-¹	U		14	2.2	1.8	27	8.1	26
	Beryllium	7440417	µg l-¹	U		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Bismuth	7440699	µg l-¹	N		34	5.4	1.1	37	16	2.3
	Cadmium	7440439	µg l-¹	U		0.13	<0.080	0.088	0.15	0.14	0.11
	Cerium	7440451	µg l-¹	N		4.6	<1.0	<1.0	6.4	2.4	<1.0
	Cobalt	7440484	µg l-¹	U		<1.0	<1.0	<1.0	1.2	<1.0	<1.0
	Chromium	7440473	µg l-¹	U		145	44	12	15	8.1	20
	Caesium	7440762	µg l-¹	N		4.2	1.7	1.0	4.6	4.1	2.8
	Copper	7440508	µg l-¹	U		28	4.2	1.3	46	13	1.9
	Iron	7439896	µg l-¹	N		1750	420	84	2050	1650	395
	Gallium	7440553	µg l-¹	N		4.8	2.1	<1.0	8.0	3.3	<1.0

All tests undertaken between 04/02/2013 and 03/04/2013

* Accreditation status

This report should be interpreted in conjuction with the notes on the accompanying cover page.

Chemtest Technical Services
Depot Road
Newmarket
Suffolk
CB8 0AL

FAO S Fisher/J Cutting/ P Hellier

LABORATORY TEST REPORT

Results of analysis of 90 samples
received 4 February 2013

A26086 - pH dependence, Coffey Geotechnic

Chemtest
The right chemistry to deliver results

Report Date
11 February 2013

Login Batch No					**221743**						
Chemtest LIMS ID					AI23210	AI23211	AI23212	AI23213	AI23214	AI23215
Sample ID					SGS383:0141R	SGS383:0141R	SGS383:0141R	SGS383:0004R	SGS383:0004R	SGS383:0004R
Sample No					F	H	G	E	J	L
Sampling Date					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Depth										
Matrix					*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
SOP↓	Determinand↓	CAS No↓	Units↓	*						
1010	pH	PH		U	3.345	6.282	4.993	7.981	6.524	7.025
1020	Electrical Conductivity	EC	µS cm-¹	U	5420	4490	5120	212	364	67.4
1040	Total Dissolved Solids	TDS	mg l-¹	N	3523	2918	124	59	237	44
1170	Redox potential	EH	mV	N	228.7	208.1	191.1	91	53	109.6
1180	Sulfur (total)	7704349	mg l-¹	N	<1	<1	<1	<1	<1	<1
1220	Alkalinity	ALK	mg CaCO3 l-¹	U	< 10	39	13	86	36	19
	Chloride	16887006	mg l-¹	U	1700	1400	1400	27	86	18
	Fluoride	16984488	mg l-¹	U	2.2	0.42	3.3	3.7	1.6	0.26
1610	Dissolved Organic Carbon	DOC	mg l-¹	N	< 2.5	< 2.5	< 2.5	<2.5	2.8	3.3
6030	Silver	7440224	µg l-¹	N	0.71	1.4	<0.50	<0.50	<0.50	<0.50
	Aluminium	7429905	µg l-¹	N	3050	165	1050	790	560	2500
	Gold	7440575	µg l-¹	N	105	6.8	22	2.4	34	<1.0
	Arsenic	7440382	µg l-¹	U	13	14	17	165	2.8	12
	Barium	7440393	µg l-¹	U	220	89	105	5.4	29	2.7
	Beryllium	7440417	µg l-¹	U	<1.0	<1.0	<1.0	<1.0	2.1	<1.0
	Bismuth	7440699	µg l-¹	N	<0.50	1.6	<0.50	<0.50	<0.50	<0.50
	Cadmium	7440439	µg l-¹	U	0.87	0.65	0.63	<0.080	0.22	0.087
	Cerium	7440451	µg l-¹	N	9.2	<1.0	4.4	<1.0	<1.0	<1.0
	Cobalt	7440484	µg l-¹	U	8.9	7.7	6.3	<1.0	4.9	<1.0
	Chromium	7440473	µg l-¹	U	2.1	9.3	<1.0	80	<1.0	2.9
	Caesium	7440762	µg l-¹	N	2.5	3.6	3.0	1.2	3.8	3.1
	Copper	7440508	µg l-¹	U	56	2.9	28	5.2	11	2.8
	Iron	7439896	µg l-¹	N	6000	1500	5100	690	2750	510
	Gallium	7440553	µg l-¹	N	3.7	1.3	1.7	<1.0	<1.0	<1.0

* Accreditation status

This report should be interpreted in conjuction with the notes on the accompanying cover page.

Chemtest Technical Services
Depot Road
Newmarket
Suffolk
CB8 0AL

FAO S Fisher/J Cutting/ P Hellier

LABORATORY TEST REPORT

Results of analysis of 90 samples
received 4 February 2013

A26086 - pH dependence, Coffey Geotechnic

Chemtest
The right chemistry to deliver results

Report Date
11 February 2013

Login Batch No					**221743**						
Chemtest LIMS ID					AI23216	AI23217	AI23218	AI23219	AI23220	AI23221
Sample ID					SGS383:0004R	SGS383:0004R	SGS383:0004R	SGS383:0004R	SGS383:0004R	SGS383:0004R
Sample No					I	C	M	D	K	H
Sampling Date					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Depth										
Matrix					*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
SOP↓	Determinand↓	CAS No↓	Units↓	*						
1010	pH	PH		U	5.893	11.213	11.128	7.837	6.543	3.889
1020	Electrical Conductivity	EC	µS cm-¹	U	238	496	442	100.4	32.7	1102
1040	Total Dissolved Solids	TDS	mg l-¹	N	155	322	680	65	21	716
1170	Redox potential	EH	mV	N	98.7	22	95	123.7	72	294
1180	Sulfur (total)	7704349	mg l-¹	N	<1	<1	<1	<1	<1	<1
1220	Alkalinity	ALK	mg CaCO3 l-¹	U	20	210	180	64	27	< 10
	Chloride	16887006	mg l-¹	U	12	23	18	20	3.4	260
	Fluoride	16984488	mg l-¹	U	0.92	2.1	2.1	3.7	0.41	1.8
1610	Dissolved Organic Carbon	DOC	mg l-¹	N	< 2.5	18	5.7	10	< 2.5	< 2.5
6030	Silver	7440224	µg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	Aluminium	7429905	µg l-¹	N	2650	8700	7900	26	220	20000
	Gold	7440575	µg l-¹	N	<1.0	<1.0	<1.0	15	<1.0	<1.0
	Arsenic	7440382	µg l-¹	U	10	1370	1000	130	9.4	4.7
	Barium	7440393	µg l-¹	U	16	1.8	1.6	2.2	<1.0	145
	Beryllium	7440417	µg l-¹	U	1.2	<1.0	<1.0	<1.0	<1.0	24
	Bismuth	7440699	µg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	Cadmium	7440439	µg l-¹	U	0.12	0.11	0.10	<0.080	0.090	0.39
	Cerium	7440451	µg l-¹	N	<1.0	1.2	1.3	<1.0	<1.0	11
	Cobalt	7440484	µg l-¹	U	2.9	<1.0	<1.0	<1.0	<1.0	20
	Chromium	7440473	µg l-¹	U	2.4	8.3	6.0	2.3	<1.0	9.5
	Caesium	7440762	µg l-¹	N	4.9	5.3	3.6	<1.0	<1.0	8.5
	Copper	7440508	µg l-¹	U	4.9	11	8.4	1.3	<1.0	190
	Iron	7439896	µg l-¹	N	2050	850	610	<20	<20	18400
	Gallium	7440553	µg l-¹	N	1.1	14	14	<1.0	<1.0	2.6

* Accreditation status

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Chemtest Technical Services
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LABORATORY TEST REPORT

Results of analysis of 90 samples
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A26086 - pH dependence, Coffey Geotechnic

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Report Date
11 February 2013

Login Batch No					**221743**						
Chemtest LIMS ID					AI23222	AI23223	AI23224	AI23225	AI23226	AI23227
Sample ID					SGS383:0185R	SGS383:0185R	SGS383:0185R	SGS383:0185R	SGS383:0185R	SGS383:0185R
Sample No					C	E	L	M	J	I
Sampling Date					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Depth										
Matrix					*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
SOP↓	Determinand↓	CAS No↓	Units↓	*						
1010	pH	PH		U	11.176	8.856	8.121	5.953	7.227	5.367
1020	Electrical Conductivity	EC	µS cm-¹	U	293	101.4	48.6	185.6	114	213
1040	Total Dissolved Solids	TDS	mg l-¹	N	190	66	32	121	74	138
1170	Redox potential	EH	mV	N	153.5	150.2	156	130	136	218
1180	Sulfur (total)	7704349	mg l-¹	N	<1	<1	<1	<1	<1	<1
1220	Alkalinity	ALK	mg CaCO3 l-¹	U	150	64	33	37	32	35
	Chloride	16887006	mg l-¹	U	15	15	6.2	47	15	8.2
	Fluoride	16984488	mg l-¹	U	0.49	1.1	0.64	1.1	0.35	1.9
1610	Dissolved Organic Carbon	DOC	mg l-¹	N	14	4.4	3.3	7.3	< 2.5	45
6030	Silver	7440224	µg l-¹	N	1.1	<0.50	<0.50	<0.50	<0.50	<0.50
	Aluminium	7429905	µg l-¹	N	9800	140	3000	72	550	255
	Gold	7440575	µg l-¹	N	<1.0	19	<1.0	15	<1.0	8.6
	Arsenic	7440382	µg l-¹	U	1700	690	115	4.4	7.7	1.9
	Barium	7440393	µg l-¹	U	29	<1.0	29	59	16	160
	Beryllium	7440417	µg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Bismuth	7440699	µg l-¹	N	28	<0.50	14	<0.50	1.9	<0.50
	Cadmium	7440439	µg l-¹	U	0.086	<0.080	0.098	0.17	<0.080	0.32
	Cerium	7440451	µg l-¹	N	6.2	<1.0	3.1	<1.0	<1.0	<1.0
	Cobalt	7440484	µg l-¹	U	1.5	<1.0	1.2	2.0	<1.0	8.8
	Chromium	7440473	µg l-¹	U	14	120	5.0	37	1.3	2.7
	Caesium	7440762	µg l-¹	N	4.2	<1.0	3.2	<1.0	<1.0	1.1
	Copper	7440508	µg l-¹	U	63	2.5	33	7.2	2.1	26
	Iron	7439896	µg l-¹	N	3800	35	1000	1650	80	2900
	Gallium	7440553	µg l-¹	N	11	<1.0	1.7	<1.0	<1.0	2.2

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Login Batch No					**221743**						
Chemtest LIMS ID					AI23228	AI23229	AI23230	AI23231	AI23232	AI23233
Sample ID					SGS383:0185R	SGS383:0185R	SGS383:0185R	SGS383:0069R	SGS383:0069R	SGS383:0069R
Sample No					D	K	H	C	M	L
Sampling Date					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Depth										
Matrix					*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
SOP↓	Determinand↓	CAS No↓	Units↓	*						
1010	pH	PH		U	10.099	8.283	3.929	11.061	8.572	4.051
1020	Electrical Conductivity	EC	µS cm-¹	U	119	48.4	693	347	48	470
1040	Total Dissolved Solids	TDS	mg l-¹	N	77	31	450	226	31	306
1170	Redox potential	EH	mV	N	69.7	-74.8	291.7	93.1	101.6	230.8
1180	Sulfur (total)	7704349	mg l-¹	N	<1	<1	<1	<1	<1	<1
1220	Alkalinity	ALK	mg CaCO3 l-¹	U	52	32	< 10	160	30	< 10
	Chloride	16887006	mg l-¹	U	11	6.6	130	8.3	2.4	120
	Fluoride	16984488	mg l-¹	U	1.1	0.66	2.9	0.51	1.8	2.7
1610	Dissolved Organic Carbon	DOC	mg l-¹	N	13	< 2.5	15	12	< 2.5	< 2.5
6030	Silver	7440224	µg l-¹	N	0.52	<0.50	<0.50	<0.50	<0.50	<0.50
	Aluminium	7429905	µg l-¹	N	2550	1230	17100	10900	980	7700
	Gold	7440575	µg l-¹	N	<1.0	<1.0	1.6	<1.0	<1.0	5.2
	Arsenic	7440382	µg l-¹	U	990	85	25	220	3.0	8.0
	Barium	7440393	µg l-¹	U	7.1	13	460	37	14	75
	Beryllium	7440417	µg l-¹	U	<1.0	<1.0	5.1	1.6	1.1	3.6
	Bismuth	7440699	µg l-¹	N	7.9	12	8.8	8.5	0.85	<0.50
	Cadmium	7440439	µg l-¹	U	0.10	0.080	0.61	0.095	0.20	0.26
	Cerium	7440451	µg l-¹	N	1.7	2.8	18	1.5	<1.0	1.9
	Cobalt	7440484	µg l-¹	U	<1.0	<1.0	23	1.3	2.6	2.5
	Chromium	7440473	µg l-¹	U	6.2	3.3	10	7.5	1.2	33
	Caesium	7440762	µg l-¹	N	<1.0	1.6	3.7	6.7	2.1	2.7
	Copper	7440508	µg l-¹	U	19	20	650	45	4.4	15
	Iron	7439896	µg l-¹	N	930	1350	20300	1750	3500	9600
	Gallium	7440553	µg l-¹	N	6.8	<1.0	10	14	<1.0	1.3

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Login Batch No					**221743**						
Chemtest LIMS ID					AI23234	AI23235	AI23236	AI23237	AI23238	AI23239
Sample ID					SGS383:0069R	SGS383:0069R	SGS383:0069R	SGS383:0069R	SGS383:0069R	SGS383:0069R
Sample No					J	N	I	H	E	K
Sampling Date					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Depth										
Matrix					*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
SOP↓	Determinand↓	CAS No↓	Units↓	*						
1010	pH	PH		U	7.563	6.774	5.756	4.953	9.563	8.609
1020	Electrical Conductivity	EC	µS cm-¹	U	77	105	172.7	363	73	43.1
1040	Total Dissolved Solids	TDS	mg l-¹	N	50	68	111	236	47	28
1170	Redox potential	EH	mV	N	133.4	141.6	174.6	259.6	105.6	159.9
1180	Sulfur (total)	7704349	mg l-¹	N	<1	<1	<1	<1	<1	<1
1220	Alkalinity	ALK	mg CaCO3 l-¹	U	36	32	79	22	45	37
	Chloride	16887006	mg l-¹	U	1.6	1.8	1.3	5.6	3.4	1.9
	Fluoride	16984488	mg l-¹	U	1.7	1.1	3.0	4.4	2.0	1.9
1610	Dissolved Organic Carbon	DOC	mg l-¹	N	< 2.5	< 2.5	< 2.5	< 2.5	<2.5	< 2.5
6030	Silver	7440224	µg l-¹	N	<0.50	<0.50	<0.50	<0.50	0.53	<0.50
	Aluminium	7429905	µg l-¹	N	5800	2850	1260	6200	4400	4900
	Gold	7440575	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	2.5	<1.0
	Arsenic	7440382	µg l-¹	U	61	18	2.4	8.3	425	155
	Barium	7440393	µg l-¹	U	27	9.4	16	91	13	27
	Beryllium	7440417	µg l-¹	U	1.4	<1.0	1.1	5.0	<1.0	1.3
	Bismuth	7440699	µg l-¹	N	6.3	2.2	<0.50	0.89	6.1	6.6
	Cadmium	7440439	µg l-¹	U	0.080	<0.080	0.22	0.36	<0.080	<0.080
	Cerium	7440451	µg l-¹	N	1.5	<1.0	<1.0	2.6	1.2	1.3
	Cobalt	7440484	µg l-¹	U	<1.0	<1.0	3.0	4.8	<1.0	<1.0
	Chromium	7440473	µg l-¹	U	2.1	<1.0	<1.0	2.5	130	41
	Caesium	7440762	µg l-¹	N	9.6	6.6	2.4	4.5	6.0	6.3
	Copper	7440508	µg l-¹	U	35	8.4	4.9	99	37	34
	Iron	7439896	µg l-¹	N	2200	920	4000	10600	2450	1650
	Gallium	7440553	µg l-¹	N	5.5	2.7	<1.0	2.0	8.7	6.5

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Login Batch No					**221743**						
Chemtest LIMS ID					AI23240	AI23241	AI23242	AI23243	AI23244	AI23245
Sample ID					SGS383:0182R	SGS383:0182R	SGS383:0182R	SGS383:0182R	SGS383:0182R	SGS383:0182R
Sample No					C	L	E	M	J	N
Sampling Date					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Depth										
Matrix					*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
SOP↓	Determinand↓	CAS No↓	Units↓	*						
1010	pH	PH		U	10.843	9.967	9.111	8.253	5.867	6.913
1020	Electrical Conductivity	EC	µS cm-¹	U	299	163.3	66	55.4	730	121
1040	Total Dissolved Solids	TDS	mg l-¹	N	194	106	43	36	474	79
1170	Redox potential	EH	mV	N	71.4	104.7	142.3	-30.4	167.4	208
1180	Sulfur (total)	7704349	mg l-¹	N	<1	<1	<1	<1	<1	<1
1220	Alkalinity	ALK	mg CaCO3 l-¹	U	140	89	40	36	41	31
	Chloride	16887006	mg l-¹	U	8.1	9.5	6.5	7.0	35	6.4
	Fluoride	16984488	mg l-¹	U	0.70	1.5	1.4	1.2	1.3	1.3
1610	Dissolved Organic Carbon	DOC	mg l-¹	N	17	7.1	4.4	<2.5	< 2.5	< 2.5
6030	Silver	7440224	µg l-¹	N	0.85	<0.50	<0.50	18	<0.50	4.5
	Aluminium	7429905	µg l-¹	N	22600	940	5000	3800	275	240
	Gold	7440575	µg l-¹	N	2.3	9.6	2.3	<1.0	11	<1.0
	Arsenic	7440382	µg l-¹	U	3700	1000	1450	225	6.8	3.3
	Barium	7440393	µg l-¹	U	36	1.7	14	15	1.2	2.9
	Beryllium	7440417	µg l-¹	U	4.0	<1.0	1.5	1.2	<1.0	<1.0
	Bismuth	7440699	µg l-¹	N	44	<0.50	23	31	<0.50	2.1
	Cadmium	7440439	µg l-¹	U	0.18	<0.080	0.13	0.14	0.15	0.13
	Cerium	7440451	µg l-¹	N	9.6	<1.0	5.0	6.6	<1.0	<1.0
	Cobalt	7440484	µg l-¹	U	9.1	<1.0	3.3	2.8	2.3	5.2
	Chromium	7440473	µg l-¹	U	16	2.9	145	2.9	<1.0	<1.0
	Caesium	7440762	µg l-¹	N	25	1.6	11	12	5.4	5.6
	Copper	7440508	µg l-¹	U	140	2.8	63	53	2.4	1.4
	Iron	7439896	µg l-¹	N	5400	95	1600	1300	240	36
	Gallium	7440553	µg l-¹	N	14	2.8	3.4	2.7	<1.0	<1.0

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Login Batch No					**221743**						
Chemtest LIMS ID					AI23246	AI23247	AI23248	AI23249	AI23250	AI23251
Sample ID					SGS383:0182R	SGS383:0182R	SGS383:0182R	SGS383:0183R	SGS383:0183R	SGS383:0183R
Sample No					H	K	I	C	E	L
Sampling Date					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Depth										
Matrix					*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
SOP↓	Determinand↓	CAS No↓	Units↓	*						
1010	pH	PH		U	4.494	7.607	3.776	10.784	9.797	8.705
1020	Electrical Conductivity	EC	µS cm-¹	U	343	53.9	804	267	88	55
1040	Total Dissolved Solids	TDS	mg l-¹	N	223	35	522	174	57	36
1170	Redox potential	EH	mV	N	196	42.4	312.1	164.4	141	171.2
1180	Sulfur (total)	7704349	mg l-¹	N	<1	<1	<1	<1	<1	<1
1220	Alkalinity	ALK	mg CaCO3 l-¹	U	< 10	40	< 10	150	54	45
	Chloride	16887006	mg l-¹	U	11	6.5	200	12	6.8	6.2
	Fluoride	16984488	mg l-¹	U	10	1.1	19	0.87	1.3	0.93
1610	Dissolved Organic Carbon	DOC	mg l-¹	N	< 2.5	< 2.5	< 2.5	11	4.0	2.7
6030	Silver	7440224	µg l-¹	N	2.0	1.5	<0.50	0.87	<0.50	<0.50
	Aluminium	7429905	µg l-¹	N	3550	8200	9100	9600	4000	1650
	Gold	7440575	µg l-¹	N	<1.0	<1.0	18	<1.0	2.7	<1.0
	Arsenic	7440382	µg l-¹	U	13	305	35	1000	670	435
	Barium	7440393	µg l-¹	U	5.5	26	9.5	24	17	13
	Beryllium	7440417	µg l-¹	U	2.5	2.1	4.3	<1.0	<1.0	<1.0
	Bismuth	7440699	µg l-¹	N	3.2	41	<0.50	22	12	15
	Cadmium	7440439	µg l-¹	U	0.46	0.33	0.82	0.14	0.15	<0.080
	Cerium	7440451	µg l-¹	N	2.5	8.7	10	4.7	2.6	3.2
	Cobalt	7440484	µg l-¹	U	35	5.1	41	<1.0	<1.0	<1.0
	Chromium	7440473	µg l-¹	U	<1.0	3.5	11	8.5	150	36
	Caesium	7440762	µg l-¹	N	10	17	14	4.5	3.3	1.8
	Copper	7440508	µg l-¹	U	63	82	3250	30	14	27
	Iron	7439896	µg l-¹	N	11200	2650	43800	3250	950	1800
	Gallium	7440553	µg l-¹	N	<1.0	4.1	<1.0	9.2	4.6	1.6

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Login Batch No					**221743**						
Chemtest LIMS ID					AI23252	AI23253	AI23254	AI23255	AI23256	AI23257
Sample ID					SGS383:0183R	SGS383:0183R	SGS383:0183R	SGS383:0183R	SGS383:0183R	SGS383:0183R
Sample No					M	N	J	H	K	I
Sampling Date					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Depth										
Matrix					*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
SOP↓	Determinand↓	CAS No↓	Units↓	*						
1010	pH	PH		U	7.883	7.744	6.683	5.477	6.522	3.755
1020	Electrical Conductivity	EC	µS cm-¹	U	63.5	50.2	112	1002	49.3	717
1040	Total Dissolved Solids	TDS	mg l-¹	N	41	33	73	651	32	466
1170	Redox potential	EH	mV	N	171.8	201	196.4	178.6	102	314.5
1180	Sulfur (total)	7704349	mg l-¹	N	<1	<1	<1	<1	<1	<1
1220	Alkalinity	ALK	mg CaCO3 l-¹	U	46	41	37	34	41	< 10
	Chloride	16887006	mg l-¹	U	6.6	5.9	12	200	9.5	170
	Fluoride	16984488	mg l-¹	U	0.76	0.57	0.31	15	0.68	4.4
1610	Dissolved Organic Carbon	DOC	mg l-¹	N	4.3	<2.5	< 2.5	3.8	< 2.5	< 2.5
6030	Silver	7440224	µg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	Aluminium	7429905	µg l-¹	N	2450	800	1260	1160	510	9500
	Gold	7440575	µg l-¹	N	<1.0	<1.0	<1.0	2.0	<1.0	15
	Arsenic	7440382	µg l-¹	U	93	60	7.0	3.2	5.6	7.8
	Barium	7440393	µg l-¹	U	31	8.1	9.6	175	4.3	125
	Beryllium	7440417	µg l-¹	U	<1.0	<1.0	<1.0	1.1	<1.0	2.6
	Bismuth	7440699	µg l-¹	N	17	7.7	2.9	1.4	1.1	<0.50
	Cadmium	7440439	µg l-¹	U	0.080	<0.080	0.14	0.73	<0.080	0.78
	Cerium	7440451	µg l-¹	N	3.0	1.5	<1.0	2.2	<1.0	13
	Cobalt	7440484	µg l-¹	U	1.1	<1.0	<1.0	4.4	<1.0	7.1
	Chromium	7440473	µg l-¹	U	9.6	5.4	1.6	<1.0	<1.0	9.8
	Caesium	7440762	µg l-¹	N	2.7	1.2	2.6	12	1.7	5.4
	Copper	7440508	µg l-¹	U	33	11	2.0	8.8	<1.0	135
	Iron	7439896	µg l-¹	N	850	710	260	19700	195	41500
	Gallium	7440553	µg l-¹	N	1.5	<1.0	<1.0	3.0	<1.0	1.7

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Login Batch No					**221743**						
Chemtest LIMS ID					AI23258	AI23259	AI23260	AI23261	AI23262	AI23263
Sample ID					SGS383:0012R	SGS383:0012R	SGS383:0012R	SGS383:0012R	SGS383:0012R	SGS383:0012R
Sample No					C	D	E	L	M	H
Sampling Date					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Depth										
Matrix					*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
SOP↓	Determinand↓	CAS No↓	Units↓	*						
1010	pH	PH		U	10.679	9.545	8.567	7.794	6.321	5.314
1020	Electrical Conductivity	EC	µS cm-¹	U	236	116.1	86	49	114	338
1040	Total Dissolved Solids	TDS	mg l-¹	N	153	75	56	32	74	220
1170	Redox potential	EH	mV	N	123.6	123.9	135	165.6	169.7	173.6
1180	Sulfur (total)	7704349	mg l-¹	N	<1	<1	<1	<1	<1	<1
1220	Alkalinity	ALK	mg CaCO3 l-¹	U	130	58	23	21	<10	120
	Chloride	16887006	mg l-¹	U	11	8.6	11	4.9	4.6	5.0
	Fluoride	16984488	mg l-¹	U	1.3	2.0	1.7	1.1	0.39	10
1610	Dissolved Organic Carbon	DOC	mg l-¹	N	12	12	<2.5	< 2.5	< 2.5	< 2.5
6030	Silver	7440224	µg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	Aluminium	7429905	µg l-¹	N	4700	2350	2050	5800	255	770
	Gold	7440575	µg l-¹	N	<1.0	<1.0	1.5	<1.0	1.4	1.8
	Arsenic	7440382	µg l-¹	U	380	345	135	32	2.2	1.7
	Barium	7440393	µg l-¹	U	8.7	8.7	9.4	14	4.7	33
	Beryllium	7440417	µg l-¹	U	<1.0	<1.0	<1.0	1.6	<1.0	1.8
	Bismuth	7440699	µg l-¹	N	3.0	2.5	3.9	2.8	<0.50	<0.50
	Cadmium	7440439	µg l-¹	U	0.12	0.12	0.096	0.14	0.16	0.86
	Cerium	7440451	µg l-¹	N	13	21	6.2	16	<1.0	<1.0
	Cobalt	7440484	µg l-¹	U	1.3	1.3	<1.0	1.9	2.7	24
	Chromium	7440473	µg l-¹	U	5.2	6.0	125	42	5.6	1.8
	Caesium	7440762	µg l-¹	N	3.6	4.1	4.0	12	6.6	11
	Copper	7440508	µg l-¹	U	22	21	19	27	1.9	20
	Iron	7439896	µg l-¹	N	850	610	1320	1240	305	14100
	Gallium	7440553	µg l-¹	N	5.9	4.7	1.4	2.5	<1.0	<1.0

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A26086 - pH dependence, Coffey Geotechnic

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Login Batch No					**221743**						
Chemtest LIMS ID					AI23264	AI23265	AI23266	AI23267	AI23268	AI23269
Sample ID					SGS383:0012R	SGS383:0012R	SGS383:0012R	SGS383:0184R	SGS383:0184R	SGS383:0184R
Sample No					K	J	I	C	E	H
Sampling Date					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Depth										
Matrix					*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
SOP↓	Determinand↓	CAS No↓	Units↓	*						
1010	pH	PH		U	6.495	6.085	3.752	10.893	9.161	5.418
1020	Electrical Conductivity	EC	µS cm-¹	U	47.5	136	769	242	71	582
1040	Total Dissolved Solids	TDS	mg l-¹	N	31	88	500	157	46	378
1170	Redox potential	EH	mV	N	76	118.2	301.1	92.6	117	180.1
1180	Sulfur (total)	7704349	mg l-¹	N	<1	<1	<1	<1	<1	<1
1220	Alkalinity	ALK	mg CaCO3 l-¹	U	23	60	< 10	110	24	24
	Chloride	16887006	mg l-¹	U	5.0	24	180	13	8.2	71
	Fluoride	16984488	mg l-¹	U	1.2	0.68	4.5	0.76	0.95	3.4
1610	Dissolved Organic Carbon	DOC	mg l-¹	N	< 2.5	< 2.5	< 2.5	14	<2.5	< 2.5
6030	Silver	7440224	µg l-¹	N	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	Aluminium	7429905	µg l-¹	N	2450	39	8900	5500	3950	3100
	Gold	7440575	µg l-¹	N	<1.0	<1.0	14	<1.0	2.0	9.3
	Arsenic	7440382	µg l-¹	U	20	1.6	4.8	3700	3000	4.9
	Barium	7440393	µg l-¹	U	11	3.0	115	11	22	49
	Beryllium	7440417	µg l-¹	U	<1.0	<1.0	5.9	<1.0	1.6	2.4
	Bismuth	7440699	µg l-¹	N	1.5	<0.50	<0.50	18	33	<0.50
	Cadmium	7440439	µg l-¹	U	0.14	0.086	1.2	0.097	0.16	0.68
	Cerium	7440451	µg l-¹	N	15	<1.0	19	1.9	7.1	<1.0
	Cobalt	7440484	µg l-¹	U	2.1	<1.0	32	1.8	6.2	31
	Chromium	7440473	µg l-¹	U	1.6	<1.0	6.0	10	170	<1.0
	Caesium	7440762	µg l-¹	N	10	5.6	17	3.2	6.6	7.9
	Copper	7440508	µg l-¹	U	22	2.1	245	71	205	475
	Iron	7439896	µg l-¹	N	450	<20	38800	1440	3100	7200
	Gallium	7440553	µg l-¹	N	1.1	<1.0	1.6	6.8	3.3	<1.0

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Login Batch No					**221743**						
Chemtest LIMS ID					AI23270	AI23271	AI23272	AI23273	AI23274	AI23275
Sample ID					SGS383:0184R	SGS383:0184R	SGS383:0184R	SGS383:0184R	SGS383:0184R	SGS383:0184R
Sample No					J	L	M	N	K	I
Sampling Date					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Depth										
Matrix					*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
SOP↓	Determinand↓	CAS No↓	Units↓	*						
1010	pH	PH		U	7.334	10.330	7.947	6.037	7.177	3.952
1020	Electrical Conductivity	EC	µS cm-¹	U	112	223	59	129.6	54.1	709
1040	Total Dissolved Solids	TDS	mg l-¹	N	73	145	38	84	35	461
1170	Redox potential	EH	mV	N	150	126	138.2	153.5	158	263.7
1180	Sulfur (total)	7704349	mg l-¹	N	<1	<1	<1	<1	<1	<1
1220	Alkalinity	ALK	mg CaCO3 l-¹	U	72	110	74	27	68	< 10
	Chloride	16887006	mg l-¹	U	14	12	5.8	8.7	6.8	190
	Fluoride	16984488	mg l-¹	U	0.60	1.1	0.74	0.46	0.79	17
1610	Dissolved Organic Carbon	DOC	mg l-¹	N	< 2.5	< 2.5	7.0	8.2	< 2.5	< 2.5
6030	Silver	7440224	µg l-¹	N	18	<0.50	4.2	<0.5	3.4	1.5
	Aluminium	7429905	µg l-¹	N	1950	1600	1340	60	1750	11600
	Gold	7440575	µg l-¹	N	1.4	5.8	<1.0	2.6	<1.0	2.5
	Arsenic	7440382	µg l-¹	U	210	2200	370	<1.0	760	48
	Barium	7440393	µg l-¹	U	11	1.1	6.7	<5	9.9	19
	Beryllium	7440417	µg l-¹	U	<1.0	<1.0	<1.0	<1	<1.0	8.7
	Bismuth	7440699	µg l-¹	N	14	0.73	15	<0.5	21	2.6
	Cadmium	7440439	µg l-¹	U	0.095	0.088	0.083	<0.08	0.12	1.1
	Cerium	7440451	µg l-¹	N	1.4	<1.0	1.1	<1.0	1.8	7.7
	Cobalt	7440484	µg l-¹	U	1.6	<1.0	1.2	<1.0	1.9	50
	Chromium	7440473	µg l-¹	U	2.9	2.4	3.0	<1.0	4.9	7.2
	Caesium	7440762	µg l-¹	N	5.6	<1.0	3.5	<1.0	4.7	6.2
	Copper	7440508	µg l-¹	U	30	10	40	<1.0	69	1370
	Iron	7439896	µg l-¹	N	820	155	1600	200	2150	23500
	Gallium	7440553	µg l-¹	N	1.7	3.8	<1.0	<1.0	1.4	<1.0

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Login Batch No					**221743**						
Chemtest LIMS ID					AI23276	AI23277	AI23278	AI23279	AI23280	AI23281
Sample ID					SGS383:0040R	SGS383:0040R	SGS383:0040R	SGS383:0040R	SGS383:0040R	SGS383:0040R
Sample No					C	N	E	L	J	H
Sampling Date					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Depth										
Matrix					*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
SOP↓	Determinand↓	CAS No↓	Units↓	*						
1010	pH	PH		U	10.733	9.887	9.520	8.061	6.905	5.393
1020	Electrical Conductivity	EC	µS cm-¹	U	290	86.8	144.7	57	105	405
1040	Total Dissolved Solids	TDS	mg l-¹	N	189	56	94	37	68	263
1170	Redox potential	EH	mV	N	74.2	105.6	132.3	-25.4	75.8	145.6
1180	Sulfur (total)	7704349	mg l-¹	N	<1	<1	<1	<1	<1	<1
1220	Alkalinity	ALK	mg CaCO3 l-¹	U	190	80	83	64	63	28
	Chloride	16887006	mg l-¹	U	7.0	5.1	10	3.4	4.1	3.1
	Fluoride	16984488	mg l-¹	U	1.2	2.6	2.9	1.9	0.95	12
1610	Dissolved Organic Carbon	DOC	mg l-¹	N	14	9.8	25	2.7	< 2.5	2.7
6030	Silver	7440224	µg l-¹	N	0.94	0.74	<0.50	0.79	0.87	<0.50
	Aluminium	7429905	µg l-¹	N	7400	2100	150	1750	640	1120
	Gold	7440575	µg l-¹	N	<1.0	<1.0	9.2	<1.0	<1.0	4.3
	Arsenic	7440382	µg l-¹	U	255	160	235	30	2.3	3.1
	Barium	7440393	µg l-¹	U	4.2	2.5	<1.0	3.2	2.3	42
	Beryllium	7440417	µg l-¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	3.8
	Bismuth	7440699	µg l-¹	N	1.1	0.78	<0.50	1.6	<0.50	<0.50
	Cadmium	7440439	µg l-¹	U	0.11	0.11	0.10	<0.080	0.10	1.0
	Cerium	7440451	µg l-¹	N	8.0	5.3	<1.0	4.0	<1.0	<1.0
	Cobalt	7440484	µg l-¹	U	1.8	1.1	<1.0	<1.0	<1.0	21
	Chromium	7440473	µg l-¹	U	8.1	3.5	125	2.2	1.4	37
	Caesium	7440762	µg l-¹	N	3.6	2.8	1.5	3.6	2.2	8.5
	Copper	7440508	µg l-¹	U	57	30	2.7	23	3.7	230
	Iron	7439896	µg l-¹	N	790	490	<20	870	98	22600
	Gallium	7440553	µg l-¹	N	7.7	3.3	<1.0	<1.0	<1.0	<1.0

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Login Batch No					**221743**						
Chemtest LIMS ID					AI23282	AI23283	AI23284	AI23285	AI23286	AI23287
Sample ID					SGS383:0040R	SGS383:0040R	SGS383:0040R	SGS383:0142R	SGS383:0142R	SGS383:0142R
Sample No					K	I	M	C	K	I
Sampling Date					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Depth										
Matrix					*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
SOP↓	Determinand↓	CAS No↓	Units↓	*						
1010	pH	PH		U	7.085	5.823	4.301	10.906	8.683	7.283
1020	Electrical Conductivity	EC	µS cm-¹	U	52.4	189	952	358	145.8	887
1040	Total Dissolved Solids	TDS	mg l-¹	N	34	123	619	233	95	577
1170	Redox potential	EH	mV	N	10.3	133.7	255	82.9	132.2	210.1
1180	Sulfur (total)	7704349	mg l-¹	N	<1	<1	<1	<1	<1	<1
1220	Alkalinity	ALK	mg CaCO3 l-¹	U	69	59	< 10	250	120	220
	Chloride	16887006	mg l-¹	U	5.1	8.1	330	21	13	220
	Fluoride	16984488	mg l-¹	U	2.0	0.99	41	0.36	0.50	0.24
1610	Dissolved Organic Carbon	DOC	mg l-¹	N	3.4	< 2.5	< 2.5	35	13	15
6030	Silver	7440224	µg l-¹	N	0.64	1.4	1.2	0.50	<0.50	<0.50
	Aluminium	7429905	µg l-¹	N	1850	560	5900	7000	2550	550
	Gold	7440575	µg l-¹	N	<1.0	3.7	2.8	<1.0	<1.0	1.9
	Arsenic	7440382	µg l-¹	U	32	1.3	3.4	8800	330	28
	Barium	7440393	µg l-¹	U	2.9	10	87	16	4.7	12
	Beryllium	7440417	µg l-¹	U	<1.0	1.4	12	<1.0	<1.0	<1.0
	Bismuth	7440699	µg l-¹	N	1.1	<0.50	<0.50	51	28	6.8
	Cadmium	7440439	µg l-¹	U	0.093	0.37	1.3	0.13	0.082	0.080
	Cerium	7440451	µg l-¹	N	4.7	<1.0	3.8	8.6	4.4	<1.0
	Cobalt	7440484	µg l-¹	U	<1.0	8.4	32	1.0	<1.0	<1.0
	Chromium	7440473	µg l-¹	U	1.5	1.3	3.8	18	9.9	19
	Caesium	7440762	µg l-¹	N	3.4	5.0	11	1.6	1.8	<1.0
	Copper	7440508	µg l-¹	U	24	19	1000	91	25	8.8
	Iron	7439896	µg l-¹	N	740	1350	55700	3050	1210	430
	Gallium	7440553	µg l-¹	N	<1.0	<1.0	1.3	8.7	1.5	<1.0

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Login Batch No					**221743**						
Chemtest LIMS ID					AI23288	AI23289	AI23290	AI23291	AI23292	AI23293
Sample ID					SGS383:0142R	SGS383:0142R	SGS383:0142R	SGS383:0142R	SGS383:0142R	SGS383:0142R
Sample No					H	F	G	D	E	J
Sampling Date					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
Depth										
Matrix					*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
SOP↓	Determinand↓	CAS No↓	Units↓	*						
1010	pH	PH		U	4.217	6.733	5.583	9.367	8.743	8.275
1020	Electrical Conductivity	EC	µS cm-¹	U	5004	3004	4110	182	152	201
1040	Total Dissolved Solids	TDS	mg l-¹	N	3250	1953	2672	118	99	131
1170	Redox potential	EH	mV	N	228.6	191.4	146.7	86.4	96.7	111.3
1180	Sulfur (total)	7704349	mg l-¹	N	<1	<1	<1	<1	<1	<1
1220	Alkalinity	ALK	mg CaCO3 l-¹	U	< 10	230	61	120	120	88
	Chloride	16887006	mg l-¹	U	1900	19	1500	22	15	31
	Fluoride	16984488	mg l-¹	U	4.5	0.23	2.1	0.70	0.55	0.68
1610	Dissolved Organic Carbon	DOC	mg l-¹	N	< 2.5	14	4.3	18	12	< 2.5
6030	Silver	7440224	µg l-¹	N	34	<0.50	3.5	<0.50	<0.50	0.61
	Aluminium	7429905	µg l-¹	N	12100	740	445	1430	110	150
	Gold	7440575	µg l-¹	N	48	6.4	8.4	<1.0	1.7	2.0
	Arsenic	7440382	µg l-¹	U	45	42	19	2300	740	115
	Barium	7440393	µg l-¹	U	580	57	210	5.9	1.0	3.4
	Beryllium	7440417	µg l-¹	U	3.3	<1.0	<1.0	<1.0	<1.0	<1
	Bismuth	7440699	µg l-¹	N	<0.50	14	9.2	46	3.4	<0.5
	Cadmium	7440439	µg l-¹	U	1.9	0.35	1.3	0.13	0.087	<0.08
	Cerium	7440451	µg l-¹	N	46	<1.0	3.0	5.9	<1.0	<0.01
	Cobalt	7440484	µg l-¹	U	41	2.0	24	<1.0	<1.0	<1.0
	Chromium	7440473	µg l-¹	U	14	27	4.9	10	165	5.2
	Caesium	7440762	µg l-¹	N	1.9	2.1	1.2	1.1	<1.0	<1.0
	Copper	7440508	µg l-¹	U	680	9.9	27	42	12	9.1
	Iron	7439896	µg l-¹	N	73800	1220	5600	2200	155	410
	Gallium	7440553	µg l-¹	N	8.1	1.1	3.0	3.8	<1.0	<1.0

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					221743					
					AI23204	AI23205	AI23206	AI23207	AI23208	AI23209
					SGS383:0141R	SGS383:0141R	SGS383:0141R	SGS383:0141R	SGS383:0141R	SGS383:0141R
					E	L	J	C	K	I
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Germanium	7440564	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Hafnium	7440586	µg l-¹	N	5.1	7.3	4.1	2.3	3.4	1.5
	Mercury	7439976	µg l-¹	U	80	87	71	87	89	19
	Indium	7440746	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Lanthanum	7439910	µg l-¹	N	2.0	<1.0	<1.0	2.4	1.0	<1.0
	Lithium	7439932	µg l-¹	N	18	16	13	20	24	22
	Manganese	7439965	µg l-¹	U	61	6.7	8.3	110	22	405
	Molybdenum	7439987	µg l-¹	U	13	15	12	16	15	13
	Niobium	7440031	µg l-¹	N	7.4	4.9	3.2	3.9	4.5	2.0
	Nickel	7440020	µg l-¹	N	2.1	<1.0	<1.0	2.2	1.5	2.8
	Phosphorus	7723140	µg l-¹	N	125	41	17	130	49	14
	Lead	7439921	µg l-¹	U	5.7	<1.0	<1.0	10	2.4	<1.0
	Rubidium	7440177	µg l-¹	N	44	36	44	48	50	97
	Rhenium	7440155	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Antimony	7440364	µg l-¹	N	14	11	9.2	14	12	7.5
	Scandium	7440202	µg l-¹	N	9.6	3.5	1.9	6.4	5.0	2.8
	Selenium	7782492	µg l-¹	U	2.3	1.2	1.0	2.1	1.2	<1.0
	Silicon	7440213	µg l-¹	N	5900	3150	2000	8400	7500	3550
	Tin	7440315	µg l-¹	N	3.6	1.7	<1.0	3.3	4.5	<1.0
	Strontium	7440246	µg l-¹	N	8.1	11	24	7.9	13	115
	Tantalum	7440257	µg l-¹	N	1.4	1.4	<1.0	<1.0	1.2	<1.0
	Tellurium	13494809	µg l-¹	N	3.6	<1.0	<1.0	<1.0	<1.0	<1.0
	Thorium	7440291	µg l-¹	N	4.6	2.3	<1.0	1.8	2.0	<1.0
	Titanium	7440326	µg l-¹	N	49	24	44	52	75	280
	Thallium	7440280	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

All tests undertaken between 04/02/2013 and 03/04/2013

* Accreditation status

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Chemtest Technical Services
Depot Road
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LABORATORY TEST REPORT

Results of analysis of 90 samples
received 4 February 2013

A26086 - pH dependence, Coffey Geotechnic

Chemtest
The right chemistry to deliver results

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11 February 2013

					221743					
					AI23210	AI23211	AI23212	AI23213	AI23214	AI23215
					SGS383:0141R	SGS383:0141R	SGS383:0141R	SGS383:0004R	SGS383:0004R	SGS383:0004R
					F	H	G	E	J	L
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Germanium	7440564	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Hafnium	7440586	µg l-¹	N	<1.0	1.2	<1.0	<1.0	<1.0	<1.0
	Mercury	7439976	µg l-¹	U	<0.50	1.9	0.78	2.3	<0.50	1.6
	Indium	7440746	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Lanthanum	7439910	µg l-¹	N	4.5	<1.0	2.8	<1.0	<1.0	<1.0
	Lithium	7439932	µg l-¹	N	44	41	43	0.94	27	5.7
	Manganese	7439965	µg l-¹	U	1900	1800	1850	10	180	13
	Molybdenum	7439987	µg l-¹	U	<1.0	<1.0	<1.0	11	<1.0	<1.0
	Niobium	7440031	µg l-¹	N	<1.0	1.6	<1.0	<1.0	<1.0	2.0
	Nickel	7440020	µg l-¹	N	29	34	21	<1.0	9.3	<1.0
	Phosphorus	7723140	µg l-¹	N	13	11	29	130	5.1	18
	Lead	7439921	µg l-¹	U	9.7	<1.0	<1.0	<1.0	3.7	<1.0
	Rubidium	7440177	µg l-¹	N	73	105	87	9.8	115	35
	Rhenium	7440155	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Antimony	7440364	µg l-¹	N	9.2	<1.0	6.5	7.0	<1.0	<1.0
	Scandium	7440202	µg l-¹	N	3.5	3.3	3.1	2.4	4.9	5.0
	Selenium	7782492	µg l-¹	U	1.8	2.1	1.5	<1.0	<1.0	<1.0
	Silicon	7440213	µg l-¹	N	5700	3850	6300	4400	11200	8800
	Tin	7440315	µg l-¹	N	9.5	<1.0	5.2	3.4	2.6	<1.0
	Strontium	7440246	µg l-¹	N	355	335	305	12	64	2.3
	Tantalum	7440257	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Tellurium	13494809	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Thorium	7440291	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Titanium	7440326	µg l-¹	N	530	520	510	32	4.6	40
	Thallium	7440280	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

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					221743					
					AI23216	AI23217	AI23218	AI23219	AI23220	AI23221
					SGS383:0004R	SGS383:0004R	SGS383:0004R	SGS383:0004R	SGS383:0004R	SGS383:0004R
					I	C	M	D	K	H
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Germanium	7440564	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Hafnium	7440586	µg l-¹	N	<1.0	11	2.8	<1.0	<1.0	<1.0
	Mercury	7439976	µg l-¹	U	1.5	31	19	4.0	0.69	<0.50
	Indium	7440746	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Lanthanum	7439910	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	4.5
	Lithium	7439932	µg l-¹	N	36	2.7	1.9	<0.50	1.8	155
	Manganese	7439965	µg l-¹	U	115	3.7	3.4	1.8	<1.0	520
	Molybdenum	7439987	µg l-¹	U	<1.0	49	37	18	1.5	<1.0
	Niobium	7440031	µg l-¹	N	1.8	3.5	2.5	<1.0	<1.0	<1.0
	Nickel	7440020	µg l-¹	N	5.8	1.5	<1.0	<1.0	<1.0	34
	Phosphorus	7723140	µg l-¹	N	21	2450	2050	120	18	34
	Lead	7439921	µg l-¹	U	<1.0	<1.0	<1.0	1.6	<1.0	3.0
	Rubidium	7440177	µg l-¹	N	110	20	15	9.8	14	250
	Rhenium	7440155	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Antimony	7440364	µg l-¹	N	<1.0	4.6	3.0	2.5	<1.0	<1.0
	Scandium	7440202	µg l-¹	N	6.8	6.6	4.6	1.5	3.6	11
	Selenium	7782492	µg l-¹	U	<1.0	1.0	1.2	<1.0	<1.0	<1.0
	Silicon	7440213	µg l-¹	N	13200	12200	8700	2750	6800	20400
	Tin	7440315	µg l-¹	N	<1.0	1.4	1.1	1.5	<1.0	<1.0
	Strontium	7440246	µg l-¹	N	32	<2.0	<2.0	<2.0	<2.0	160
	Tantalum	7440257	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Tellurium	13494809	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Thorium	7440291	µg l-¹	N	<1.0	1.5	<1.0	<1.0	<1.0	<1.0
	Titanium	7440326	µg l-¹	N	47	46	33	<1.0	<1.0	22
	Thallium	7440280	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

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					221743					
					AI23222	AI23223	AI23224	AI23225	AI23226	AI23227
					SGS383:0185R	SGS383:0185R	SGS383:0185R	SGS383:0185R	SGS383:0185R	SGS383:0185R
					C	E	L	M	J	I
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Germanium	7440564	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Hafnium	7440586	µg l-¹	N	2.4	<1.0	<1.0	<1.0	<1.0	<1.0
	Mercury	7439976	µg l-¹	U	190	63	70	2.9	6.6	<0.50
	Indium	7440746	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Lanthanum	7439910	µg l-¹	N	2.6	<1.0	1.3	<1.0	<1.0	<1.0
	Lithium	7439932	µg l-¹	N	7.7	<0.50	5.8	8.4	6.3	18
	Manganese	7439965	µg l-¹	U	25	<1.0	24	310	135	485
	Molybdenum	7439987	µg l-¹	U	8.8	6.7	5.4	<1.0	2.3	<1.0
	Niobium	7440031	µg l-¹	N	6.3	<1.0	1.7	<1.0	<1.0	<1.0
	Nickel	7440020	µg l-¹	N	5.0	<1.0	12	2.6	<1.0	31
	Phosphorus	7723140	µg l-¹	N	560	120	43	9.0	14	5.5
	Lead	7439921	µg l-¹	U	9.3	<1.0	6.1	<1.0	<1.0	<1.0
	Rubidium	7440177	µg l-¹	N	26	12	29	47	42	52
	Rhenium	7440155	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Antimony	7440364	µg l-¹	N	64	54	41	9.6	22	1.3
	Scandium	7440202	µg l-¹	N	6.1	2.3	3.6	2.4	2.8	2.3
	Selenium	7782492	µg l-¹	U	1.5	<1.0	<1.0	<1.0	1.6	<1.0
	Silicon	7440213	µg l-¹	N	9400	3150	5600	4150	4750	4750
	Tin	7440315	µg l-¹	N	5.3	<1.0	2.0	<1.0	<1.0	<1.0
	Strontium	7440246	µg l-¹	N	9.7	<2.0	11	54	30	82
	Tantalum	7440257	µg l-¹	N	1.7	<1.0	<1.0	<1.0	<1.0	<1.0
	Tellurium	13494809	µg l-¹	N	1.5	<1.0	<1.0	<1.0	<1.0	<1.0
	Thorium	7440291	µg l-¹	N	3.2	<1.0	1.1	<1.0	<1.0	<1.0
	Titanium	7440326	µg l-¹	N	41	<1.0	15	3.9	4.2	6.2
	Thallium	7440280	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

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					221743					
					AI23228	AI23229	AI23230	AI23231	AI23232	AI23233
					SGS383:0185R	SGS383:0185R	SGS383:0185R	SGS383:0069R	SGS383:0069R	SGS383:0069R
					D	K	H	C	M	L
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Germanium	7440564	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Hafnium	7440586	µg l-¹	N	1.9	1.1	<1.0	<1.0	<1.0	<1.0
	Mercury	7439976	µg l-¹	U	135	81	7.3	14	0.64	<0.50
	Indium	7440746	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Lanthanum	7439910	µg l-¹	N	<1.0	1.2	9.3	<1.0	<1.0	1.0
	Lithium	7439932	µg l-¹	N	1.9	4.4	115	175	130	170
	Manganese	7439965	µg l-¹	U	6.0	16	1000	49	195	215
	Molybdenum	7439987	µg l-¹	U	7.4	5.5	<1.0	5.9	<1.0	<1.0
	Niobium	7440031	µg l-¹	N	1.9	2.4	1.1	1.1	<1.0	<1.0
	Nickel	7440020	µg l-¹	N	1.2	1.6	90	1.6	3.4	4.3
	Phosphorus	7723140	µg l-¹	N	375	41	29	190	6.6	20
	Lead	7439921	µg l-¹	U	2.6	4.5	4.3	4.0	<1.0	1.5
	Rubidium	7440177	µg l-¹	N	9.8	23	125	115	195	200
	Rhenium	7440155	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Antimony	7440364	µg l-¹	N	53	40	2.6	3.6	<1.0	4.8
	Scandium	7440202	µg l-¹	N	2.3	2.4	6.8	4.6	2.3	3.6
	Selenium	7782492	µg l-¹	U	1.1	<1.0	1.3	<1.0	<1.0	<1.0
	Silicon	7440213	µg l-¹	N	3700	4100	14000	10100	4900	7700
	Tin	7440315	µg l-¹	N	1.4	2.1	1.4	14	<1.0	2.6
	Strontium	7440246	µg l-¹	N	3.6	10	140	3.3	9.5	14
	Tantalum	7440257	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Tellurium	13494809	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Thorium	7440291	µg l-¹	N	<1.0	1.2	<1.0	4.1	1.1	<1.0
	Titanium	7440326	µg l-¹	N	11	19	17	49	1.0	4.3
	Thallium	7440280	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

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					221743					
					AI23234	AI23235	AI23236	AI23237	AI23238	AI23239
					SGS383:0069R	SGS383:0069R	SGS383:0069R	SGS383:0069R	SGS383:0069R	SGS383:0069R
					J	N	I	H	E	K
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Germanium	7440564	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Hafnium	7440586	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Mercury	7439976	µg l-¹	U	9.9	2.7	<0.50	<0.50	21	11
	Indium	7440746	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Lanthanum	7439910	µg l-¹	N	<1.0	<1.0	<1.0	1.7	<1.0	<1.0
	Lithium	7439932	µg l-¹	N	83	70	150	415	98	130
	Manganese	7439965	µg l-¹	U	47	66	225	305	26	34
	Molybdenum	7439987	µg l-¹	U	5.0	1.9	<1.0	<1.0	6.2	5.3
	Niobium	7440031	µg l-¹	N	1.4	<1.0	<1.0	<1.0	1.5	<1.0
	Nickel	7440020	µg l-¹	N	1.3	<1.0	4.2	8.0	1.2	<1.0
	Phosphorus	7723140	µg l-¹	N	46	450	11	13	220	84
	Lead	7439921	µg l-¹	U	2.3	<1.0	<1.0	1.4	<1.0	2.4
	Rubidium	7440177	µg l-¹	N	175	180	220	285	84	120
	Rhenium	7440155	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Antimony	7440364	µg l-¹	N	4.5	2.1	<1.0	<1.0	6.9	3.3
	Scandium	7440202	µg l-¹	N	3.8	2.9	2.8	3.5	3.5	3.1
	Selenium	7782492	µg l-¹	U	<1.0	1.1	<1.0	<1.0	1.2	<1.0
	Silicon	7440213	µg l-¹	N	8400	6600	5600	7500	6500	5700
	Tin	7440315	µg l-¹	N	15	10	<1.0	2.5	13	9.8
	Strontium	7440246	µg l-¹	N	3.8	3.7	11	17	2.0	2.6
	Tantalum	7440257	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Tellurium	13494809	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Thorium	7440291	µg l-¹	N	4.0	1.7	<1.0	<1.0	3.9	3.4
	Titanium	7440326	µg l-¹	N	53	29	<1.0	8.6	41	39
	Thallium	7440280	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

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					221743					
					AI23240	AI23241	AI23242	AI23243	AI23244	AI23245
					SGS383:0182R	SGS383:0182R	SGS383:0182R	SGS383:0182R	SGS383:0182R	SGS383:0182R
					C	L	E	M	J	N
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Germanium	7440564	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Hafnium	7440586	µg l-¹	N	1.4	<1.0	<1.0	7.7	<1.0	13
	Mercury	7439976	µg l-¹	U	87	35	54	28	1.7	1.1
	Indium	7440746	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Lanthanum	7439910	µg l-¹	N	3.7	<1.0	2.0	3.0	<1.0	<1.0
	Lithium	7439932	µg l-¹	N	45	2.0	14	17	14	25
	Manganese	7439965	µg l-¹	U	100	4.5	50	54	235	265
	Molybdenum	7439987	µg l-¹	U	17	14	13	8.9	2.2	<1.0
	Niobium	7440031	µg l-¹	N	4.6	<1.0	1.0	8.3	<1.0	5.6
	Nickel	7440020	µg l-¹	N	12	<1.0	3.5	2.6	<1.0	2.9
	Phosphorus	7723140	µg l-¹	N	770	205	395	105	8.3	4.5
	Lead	7439921	µg l-¹	U	8.8	<1.0	4.1	4.4	<1.0	<1.0
	Rubidium	7440177	µg l-¹	N	130	28	79	89	105	100
	Rhenium	7440155	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Antimony	7440364	µg l-¹	N	13	5.7	7.0	4.3	2.8	<1.0
	Scandium	7440202	µg l-¹	N	10	1.3	4.1	8.7	1.6	2.2
	Selenium	7782492	µg l-¹	U	1.6	1.0	<1.0	<1.0	<1.0	<1.0
	Silicon	7440213	µg l-¹	N	29500	2500	8700	5800	3300	2800
	Tin	7440315	µg l-¹	N	7.8	<1.0	1.9	2.4	<1.0	<1.0
	Strontium	7440246	µg l-¹	N	19	<2.0	9.8	10	20	17
	Tantalum	7440257	µg l-¹	N	1.1	<1.0	<1.0	2.6	<1.0	1.9
	Tellurium	13494809	µg l-¹	N	1.1	<1.0	<1.0	2.2	<1.0	<1.0
	Thorium	7440291	µg l-¹	N	8.1	<1.0	4.0	9.8	<1.0	3.7
	Titanium	7440326	µg l-¹	N	80	<1.0	24	20	1.8	2.0
	Thallium	7440280	µg l-¹	N	<1.0	<1.0	<1.0	1.6	<1.0	<1.0

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Chemtest Technical Services
Depot Road
Newmarket
Suffolk
CB8 0AL

FAO S Fisher/J Cutting/ P Hellier

LABORATORY TEST REPORT

Results of analysis of 90 samples
received 4 February 2013

A26086 - pH dependence, Coffey Geotechnic

Chemtest
The right chemistry to deliver results

Report Date
11 February 2013

					221743					
					AI23246	AI23247	AI23248	AI23249	AI23250	AI23251
					SGS383:0182R	SGS383:0182R	SGS383:0182R	SGS383:0183R	SGS383:0183R	SGS383:0183R
					H	K	I	C	E	L
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Germanium	7440564	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Hafnium	7440586	µg l-¹	N	11	1.1	<1.0	2.4	1.5	2.2
	Mercury	7439976	µg l-¹	U	1.2	37	<0.50	135	70	99
	Indium	7440746	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Lanthanum	7439910	µg l-¹	N	<1.0	3.4	4.9	2.0	<1.0	1.4
	Lithium	7439932	µg l-¹	N	83	27	61	12	7.7	3.8
	Manganese	7439965	µg l-¹	U	900	79	1280	33	37	9.7
	Molybdenum	7439987	µg l-¹	U	<1.0	9.3	<1.0	49	42	6.4
	Niobium	7440031	µg l-¹	N	5.9	5.2	<1.0	6.4	2.9	4.4
	Nickel	7440020	µg l-¹	N	27	5.2	38	1.9	1.5	2.2
	Phosphorus	7723140	µg l-¹	N	19	150	10	430	385	130
	Lead	7439921	µg l-¹	U	<1.0	6.2	2.0	5.9	4.8	4.4
	Rubidium	7440177	µg l-¹	N	180	120	225	35	26	16
	Rhenium	7440155	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Antimony	7440364	µg l-¹	N	<1.0	5.8	<1.0	12	6.4	38
	Scandium	7440202	µg l-¹	N	3.4	5.3	3.6	4.9	4.4	2.7
	Selenium	7782492	µg l-¹	U	<1.0	1.5	<1.0	1.1	<1.0	<1.0
	Silicon	7440213	µg l-¹	N	5700	11400	7400	9400	6100	3800
	Tin	7440315	µg l-¹	N	1.6	4.2	<1.0	5.5	2.2	2.4
	Strontium	7440246	µg l-¹	N	56	17	83	9.3	4.5	5.9
	Tantalum	7440257	µg l-¹	N	1.2	1.9	<1.0	1.8	1.0	1.1
	Tellurium	13494809	µg l-¹	N	<1.0	<1.0	<1.0	1.2	<1.0	<1.0
	Thorium	7440291	µg l-¹	N	3.3	6.0	<1.0	4.2	1.8	2.1
	Titanium	7440326	µg l-¹	N	10	47	11	46	16	21
	Thallium	7440280	µg l-¹	N	<1.0	<1.0	1.1	<1.0	<1.0	<1.0

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					221743					
					AI23252	AI23253	AI23254	AI23255	AI23256	AI23257
					SGS383:0183R	SGS383:0183R	SGS383:0183R	SGS383:0183R	SGS383:0183R	SGS383:0183R
					M	N	J	H	K	I
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Germanium	7440564	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Hafnium	7440586	µg l-¹	N	<1.0	1.2	<1.0	<1.0	<1.0	<1.0
	Mercury	7439976	µg l-¹	U	55	69	4.1	1.1	10	<0.50
	Indium	7440746	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Lanthanum	7439910	µg l-¹	N	1.2	<1.0	<1.0	1.1	<1.0	12
	Lithium	7439932	µg l-¹	N	6.3	6.7	8.9	52	4.5	65
	Manganese	7439965	µg l-¹	U	35	18	215	890	51	1050
	Molybdenum	7439987	µg l-¹	U	5.6	5.9	3.6	<1.0	15	<1.0
	Niobium	7440031	µg l-¹	N	2.3	2.6	1.1	<1.0	<1.0	<1.0
	Nickel	7440020	µg l-¹	N	3.6	<1.0	1.6	26	<1.0	33
	Phosphorus	7723140	µg l-¹	N	40	30	16	8.6	8.4	6.0
	Lead	7439921	µg l-¹	U	6.2	2.4	<1.0	<1.0	<1.0	4.7
	Rubidium	7440177	µg l-¹	N	29	27	68	175	39	140
	Rhenium	7440155	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Antimony	7440364	µg l-¹	N	35	46	2.0	<1.0	2.7	<1.0
	Scandium	7440202	µg l-¹	N	3.0	2.7	2.2	2.3	1.5	3.7
	Selenium	7782492	µg l-¹	U	<1.0	1.0	<1.0	1.8	<1.0	1.4
	Silicon	7440213	µg l-¹	N	4700	4250	4750	4300	2900	6700
	Tin	7440315	µg l-¹	N	1.7	1.9	<1.0	6.6	<1.0	<1.0
	Strontium	7440246	µg l-¹	N	13	11	14	44	4.6	44
	Tantalum	7440257	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Tellurium	13494809	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Thorium	7440291	µg l-¹	N	1.0	1.1	<1.0	<1.0	<1.0	<1.0
	Titanium	7440326	µg l-¹	N	13	11	4.8	7.4	4.7	3.6
	Thallium	7440280	µg l-¹	N	<1.0	<1.0	<1.0	1.1	<1.0	<1.0

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					221743					
					AI23258	AI23259	AI23260	AI23261	AI23262	AI23263
					SGS383:0012R	SGS383:0012R	SGS383:0012R	SGS383:0012R	SGS383:0012R	SGS383:0012R
					C	D	E	L	M	H
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Germanium	7440564	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Hafnium	7440586	µg l-¹	N	1.9	1.9	1.4	<1.0	<1.0	<1.0
	Mercury	7439976	µg l-¹	U	62	57	43	8.2	0.73	<0.50
	Indium	7440746	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Lanthanum	7439910	µg l-¹	N	6.0	9.5	2.8	7.1	<1.0	<1.0
	Lithium	7439932	µg l-¹	N	2.7	2.6	3.5	10	17	47
	Manganese	7439965	µg l-¹	U	7.5	6.9	6.1	26	100	620
	Molybdenum	7439987	µg l-¹	U	7.8	7.4	5.9	3.4	<1.0	<1.0
	Niobium	7440031	µg l-¹	N	2.2	1.9	2.7	1.6	<1.0	<1.0
	Nickel	7440020	µg l-¹	N	1.3	<1.0	1.7	1.4	1.1	13
	Phosphorus	7723140	µg l-¹	N	680	650	135	75	14	17
	Lead	7439921	µg l-¹	U	2.0	2.2	<1.0	1.9	<1.0	<1.0
	Rubidium	7440177	µg l-¹	N	24	25	29	67	86	155
	Rhenium	7440155	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Antimony	7440364	µg l-¹	N	5.8	5.2	6.2	2.5	<1.0	<1.0
	Scandium	7440202	µg l-¹	N	2.3	1.8	2.8	4.1	1.7	2.4
	Selenium	7782492	µg l-¹	U	<1.0	<1.0	1.0	1.2	1.2	1.1
	Silicon	7440213	µg l-¹	N	5300	3700	5400	8800	3400	5000
	Tin	7440315	µg l-¹	N	1.3	1.1	2.0	1.7	<1.0	<1.0
	Strontium	7440246	µg l-¹	N	2.8	3.9	3.2	5.0	9.2	59
	Tantalum	7440257	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Tellurium	13494809	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Thorium	7440291	µg l-¹	N	5.9	8.0	5.5	5.2	1.3	1.1
	Titanium	7440326	µg l-¹	N	13	12	25	20	5.1	7.4
	Thallium	7440280	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

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					221743					
					AI23264	AI23265	AI23266	AI23267	AI23268	AI23269
					SGS383:0012R	SGS383:0012R	SGS383:0012R	SGS383:0184R	SGS383:0184R	SGS383:0184R
					K	J	I	C	E	H
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Germanium	7440564	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Hafnium	7440586	µg l-¹	N	<1.0	<1.0	<1.0	1.0	<1.0	<1.0
	Mercury	7439976	µg l-¹	U	8.7	0.70	<0.50	67	52	<0.50
	Indium	7440746	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Lanthanum	7439910	µg l-¹	N	6.8	<1.0	9.9	<1.0	3.2	<1.0
	Lithium	7439932	µg l-¹	N	7.6	5.7	49	6.9	14	39
	Manganese	7439965	µg l-¹	U	16	59	870	29	105	920
	Molybdenum	7439987	µg l-¹	U	2.9	1.3	<1.0	7.8	5.7	<1.0
	Niobium	7440031	µg l-¹	N	<1.0	<1.0	<1.0	1.6	1.3	<1.0
	Nickel	7440020	µg l-¹	N	1.0	<1.0	18	3.0	10	38
	Phosphorus	7723140	µg l-¹	N	56	8.5	8.2	580	540	7.6
	Lead	7439921	µg l-¹	U	2.0	<1.0	3.8	3.3	9.7	<1.0
	Rubidium	7440177	µg l-¹	N	58	82	200	25	53	185
	Rhenium	7440155	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Antimony	7440364	µg l-¹	N	2.2	<1.0	<1.0	86	94	1.6
	Scandium	7440202	µg l-¹	N	2.0	1.5	3.9	2.9	4.3	3.0
	Selenium	7782492	µg l-¹	U	<1.0	<1.0	<1.0	3.9	3.0	1.9
	Silicon	7440213	µg l-¹	N	4000	3050	7900	7100	7200	6200
	Tin	7440315	µg l-¹	N	<1.0	<1.0	<1.0	1.7	1.7	<1.0
	Strontium	7440246	µg l-¹	N	4.6	6.0	67	4.4	30	145
	Tantalum	7440257	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Tellurium	13494809	µg l-¹	N	<1.0	<1.0	<1.0	1.0	<1.0	<1.0
	Thorium	7440291	µg l-¹	N	5.3	1.1	<1.0	1.6	3.4	<1.0
	Titanium	7440326	µg l-¹	N	8.2	<1.0	4.5	11	38	13
	Thallium	7440280	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	2.0

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					221743					
					AI23270	AI23271	AI23272	AI23273	AI23274	AI23275
					SGS383:0184R	SGS383:0184R	SGS383:0184R	SGS383:0184R	SGS383:0184R	SGS383:0184R
					J	L	M	N	K	I
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Germanium	7440564	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Hafnium	7440586	µg l-¹	N	8.4	<1.0	6.5	<1.0	5.3	7.3
	Mercury	7439976	µg l-¹	U	31	38	47	<0.50	70	2.5
	Indium	7440746	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Lanthanum	7439910	µg l-¹	N	1.1	<1.0	<1.0	<1.0	<1.0	3.8
	Lithium	7439932	µg l-¹	N	24	2.1	12	7	17	115
	Manganese	7439965	µg l-¹	U	77	7.6	26	110	38	1280
	Molybdenum	7439987	µg l-¹	U	5.0	6.7	4.8	1.0	6.5	<1.0
	Niobium	7440031	µg l-¹	N	8.9	<1.0	7.0	1.0	8.0	4.2
	Nickel	7440020	µg l-¹	N	2.4	<1.0	2.3	2.0	3.8	65
	Phosphorus	7723140	µg l-¹	N	41	305	63	7	130	31
	Lead	7439921	µg l-¹	U	1.8	<1.0	2.0	<1.0	3.7	1.5
	Rubidium	7440177	µg l-¹	N	74	17	38	24	56	185
	Rhenium	7440155	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Antimony	7440364	µg l-¹	N	79	85	62	24	95	4.0
	Scandium	7440202	µg l-¹	N	8.5	1.8	2.4	<1.0	3.4	5.0
	Selenium	7782492	µg l-¹	U	2.0	2.5	1.3	1.4	2.6	1.4
	Silicon	7440213	µg l-¹	N	6500	3550	4100	2600	5500	10000
	Tin	7440315	µg l-¹	N	2.3	<1.0	2.3	3.6	2.9	<1.0
	Strontium	7440246	µg l-¹	N	28	<2.0	10	18	14	210
	Tantalum	7440257	µg l-¹	N	2.0	<1.0	2.4	<1.0	2.8	1.1
	Tellurium	13494809	µg l-¹	N	2.6	<1.0	<1.0	<1.0	<1.0	<1.0
	Thorium	7440291	µg l-¹	N	6.3	<1.0	3.0	<1.0	2.7	2.5
	Titanium	7440326	µg l-¹	N	14	<1.0	15	3.6	19	37
	Thallium	7440280	µg l-¹	N	1.5	<1.0	<1.0	<1.0	<1.0	1.4

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					221743					
					AI23276	AI23277	AI23278	AI23279	AI23280	AI23281
					SGS383:0040R	SGS383:0040R	SGS383:0040R	SGS383:0040R	SGS383:0040R	SGS383:0040R
					C	N	E	L	J	H
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Germanium	7440564	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Hafnium	7440586	µg l-¹	N	4.3	4.9	<1.0	2.1	<1.0	<1.0
	Mercury	7439976	µg l-¹	U	53	39	25	23	1.5	1.4
	Indium	7440746	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Lanthanum	7439910	µg l-¹	N	2.4	1.6	<1.0	1.3	<1.0	<1.0
	Lithium	7439932	µg l-¹	N	4.9	3.6	1.2	9.8	18	45
	Manganese	7439965	µg l-¹	U	14	7.9	<1.0	11	78	820
	Molybdenum	7439987	µg l-¹	U	29	24	26	17	6.7	<1.0
	Niobium	7440031	µg l-¹	N	7.8	6.3	<1.0	10	2.0	<1.0
	Nickel	7440020	µg l-¹	N	2.0	1.2	<1.0	1.2	<1.0	17
	Phosphorus	7723140	µg l-¹	N	890	600	275	41	13	10
	Lead	7439921	µg l-¹	U	5.6	3.5	<1.0	2.8	<1.0	1.5
	Rubidium	7440177	µg l-¹	N	32	21	38	42	51	155
	Rhenium	7440155	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Antimony	7440364	µg l-¹	N	6.2	4.5	6.0	6.5	1.1	<1.0
	Scandium	7440202	µg l-¹	N	4.2	1.9	1.9	2.4	2.2	3.2
	Selenium	7782492	µg l-¹	U	<1.0	<1.0	1.1	<1.0	<1.0	<1.0
	Silicon	7440213	µg l-¹	N	9300	4100	3200	5100	5000	6400
	Tin	7440315	µg l-¹	N	1.4	<1.0	<1.0	1.5	<1.0	<1.0
	Strontium	7440246	µg l-¹	N	3.5	8.7	<2.0	6.1	5.6	49
	Tantalum	7440257	µg l-¹	N	2.6	1.3	<1.0	2.2	<1.0	<1.0
	Tellurium	13494809	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Thorium	7440291	µg l-¹	N	2.9	2.3	<1.0	2.1	<1.0	<1.0
	Titanium	7440326	µg l-¹	N	16	16	<1.0	30	2.9	4.7
	Thallium	7440280	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

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					221743					
					AI23282	AI23283	AI23284	AI23285	AI23286	AI23287
					SGS383:0040R	SGS383:0040R	SGS383:0040R	SGS383:0142R	SGS383:0142R	SGS383:0142R
					K	I	M	C	K	I
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Germanium	7440564	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Hafnium	7440586	µg l-¹	N	1.3	<1.0	<1.0	6.1	3.3	<1.0
	Mercury	7439976	µg l-¹	U	20	1.0	<0.50	435	245	29
	Indium	7440746	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Lanthanum	7439910	µg l-¹	N	1.5	<1.0	1.9	3.2	1.9	<1.0
	Lithium	7439932	µg l-¹	N	7.6	54	120	3.5	3.9	4.4
	Manganese	7439965	µg l-¹	U	5.6	365	1170	66	19	400
	Molybdenum	7439987	µg l-¹	U	14	<1.0	<1.0	10	6.4	5.5
	Niobium	7440031	µg l-¹	N	8.1	1.2	<1.0	5.7	2.7	<1.0
	Nickel	7440020	µg l-¹	N	<1.0	6.0	29	1.4	1.3	2.6
	Phosphorus	7723140	µg l-¹	N	52	19	13	495	64	31
	Lead	7439921	µg l-¹	U	3.2	<1.0	12	12	4.0	<1.0
	Rubidium	7440177	µg l-¹	N	35	125	230	14	20	41
	Rhenium	7440155	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Antimony	7440364	µg l-¹	N	4.8	<1.0	<1.0	28	15	6.3
	Scandium	7440202	µg l-¹	N	1.6	2.5	4.1	4.4	2.6	2.1
	Selenium	7782492	µg l-¹	U	<1.0	<1.0	<1.0	7.2	1.4	1.8
	Silicon	7440213	µg l-¹	N	4500	5900	8800	5300	3900	3500
	Tin	7440315	µg l-¹	N	1.1	<1.0	<1.0	2.6	2.0	<1.0
	Strontium	7440246	µg l-¹	N	3.3	24	72	4.2	16	120
	Tantalum	7440257	µg l-¹	N	1.8	<1.0	<1.0	<1.0	<1.0	<1.0
	Tellurium	13494809	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Thorium	7440291	µg l-¹	N	1.9	<1.0	<1.0	2.8	1.3	<1.0
	Titanium	7440326	µg l-¹	N	25	4.6	12	30	38	250
	Thallium	7440280	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

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					221743					
					AI23288	AI23289	AI23290	AI23291	AI23292	AI23293
					SGS383:0142R	SGS383:0142R	SGS383:0142R	SGS383:0142R	SGS383:0142R	SGS383:0142R
					H	F	G	D	E	J
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Germanium	7440564	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Hafnium	7440586	µg l-¹	N	<1.0	<1.0	<1.0	3.9	3.1	<1.0
	Mercury	7439976	µg l-¹	U	<0.50	11	4.0	345	295	19
	Indium	7440746	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Lanthanum	7439910	µg l-¹	N	27	<1.0	2.2	2.2	<1.0	<1.0
	Lithium	7439932	µg l-¹	N	73	9.8	25	1.8	1.0	2.3
	Manganese	7439965	µg l-¹	U	4600	1950	3200	39	6.3	30
	Molybdenum	7439987	µg l-¹	U	<1.0	3.0	<1.0	7.0	6.6	4.6
	Niobium	7440031	µg l-¹	N	<1.0	1.3	<1.0	3.2	<1.0	<1.0
	Nickel	7440020	µg l-¹	N	72	14	56	1.0	<1.0	<1.0
	Phosphorus	7723140	µg l-¹	N	26	34	15	165	83	28
	Lead	7439921	µg l-¹	U	3.6	1.2	<1.0	6.7	<1.0	<1.0
	Rubidium	7440177	µg l-¹	N	97	72	59	12	12	14
	Rhenium	7440155	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Antimony	7440364	µg l-¹	N	4.4	3.6	<1.0	21	16	11
	Scandium	7440202	µg l-¹	N	6.1	3.3	3.1	2.0	3.3	<1.0
	Selenium	7782492	µg l-¹	U	1.8	2.8	2.1	2.7	2.8	1.2
	Silicon	7440213	µg l-¹	N	12900	4550	4700	1850	3150	2100
	Tin	7440315	µg l-¹	N	3.5	<1.0	<1.0	2.2	<1.0	1.8
	Strontium	7440246	µg l-¹	N	450	285	355	4.9	12	19
	Tantalum	7440257	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Tellurium	13494809	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Thorium	7440291	µg l-¹	N	<1.0	<1.0	<1.0	2.3	<1.0	<1.0
	Titanium	7440326	µg l-¹	N	540	365	425	27	12	26
	Thallium	7440280	µg l-¹	N	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

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					221743					
					AI23204	AI23205	AI23206	AI23207	AI23208	AI23209
					SGS383:0141R	SGS383:0141R	SGS383:0141R	SGS383:0141R	SGS383:0141R	SGS383:0141R
					E	L	J	C	K	I
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Uranium	7440611	µg l-¹	N	7.8	4.8	5.5	6.2	4.8	6.4
	Vanadium	7440622	µg l-¹	U	10	6.2	4.4	23	8.2	5.9
	Tungsten	7440337	µg l-¹	N	1130	1210	1000	1240	1320	295
	Yttrium	7440655	µg l-¹	N	2.5	<1.0	<1.0	4.0	1.2	<1.0
	Zinc	7440666	µg l-¹	U	15	1.2	<1.0	23	4.3	<1.0
	Zirconium	7440677	µg l-¹	N	10	6.1	1.7	11	8.4	1.6
1415	Calcium	7440702	mg l-¹	U	8.1	12	30	6.5	13	150
	Potassium	7440097	mg l-¹	U	10	6.8	14	14	7.5	62
	Magnesium	7439954	mg l-¹	U	<0.50	<0.50	1.2	<0.50	<0.50	3.8
	Sodium	7440235	mg l-¹	U	18	8.3	5.9	58	5.5	6.4
1220	Sulfate	14808798	mg l-¹	U	1.8	1.2	<1	2.5	<1	<1

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					221743					
					AI23210	AI23211	AI23212	AI23213	AI23214	AI23215
					SGS383:0141R	SGS383:0141R	SGS383:0141R	SGS383:0004R	SGS383:0004R	SGS383:0004R
					F	H	G	E	J	L
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Uranium	7440611	µg l-¹	N	14	<1.0	<1.0	<1.0	2.7	<1.0
	Vanadium	7440622	µg l-¹	U	27	12	24	19	2.4	10
	Tungsten	7440337	µg l-¹	N	7.4	28	17	74	4.9	25
	Yttrium	7440655	µg l-¹	N	11	<1.0	4.8	2.3	20	1.9
	Zinc	7440666	µg l-¹	U	40	14	61	1.8	16	1.4
	Zirconium	7440677	µg l-¹	N	<1.0	<1.0	<1.0	2.3	<1.0	1.4
1415	Calcium	7440702	mg l-¹	U	560	500	620	5.4	6.1	<5.0
	Potassium	7440097	mg l-¹	U	18	16	21	4.3	38	9.9
	Magnesium	7439954	mg l-¹	U	24	15	14	<0.50	8.7	<0.50
	Sodium	7440235	mg l-¹	U	10	5.3	10	31	3.7	3.1
1220	Sulfate	14808798	mg l-¹	U	< 1.0	<1	<1	4.1	<1	<1

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					221743					
					AI23216	AI23217	AI23218	AI23219	AI23220	AI23221
					SGS383:0004R	SGS383:0004R	SGS383:0004R	SGS383:0004R	SGS383:0004R	SGS383:0004R
					I	C	M	D	K	H
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Uranium	7440611	µg l-¹	N	<1.0	1.3	1.1	<1.0	<1.0	29
	Vanadium	7440622	µg l-¹	U	8.7	79	62	4.0	5.6	9.1
	Tungsten	7440337	µg l-¹	N	24	530	335	115	12	1.1
	Yttrium	7440655	µg l-¹	N	5.6	9.9	11	<1.0	<1.0	770
	Zinc	7440666	µg l-¹	U	6.9	3.5	2.2	1.4	<1.0	88
	Zirconium	7440677	µg l-¹	N	1.5	5.5	2.9	<1.0	<1.0	<1.0
1415	Calcium	7440702	mg l-¹	U	<5.0	<5.0	<5.0	<5.0	<5.0	14
	Potassium	7440097	mg l-¹	U	26	4.7	3.6	5.1	3.4	60
	Magnesium	7439954	mg l-¹	U	4.2	<0.50	<0.50	<0.50	<0.50	20
	Sodium	7440235	mg l-¹	U	3.6	90	76	24	2.0	5.1
1220	Sulfate	14808798	mg l-¹	U	<1	9.9	6.2	4.0	<1	<1

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					221743					
					AI23222	AI23223	AI23224	AI23225	AI23226	AI23227
					SGS383:0185R	SGS383:0185R	SGS383:0185R	SGS383:0185R	SGS383:0185R	SGS383:0185R
					C	E	L	M	J	I
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Uranium	7440611	µg l-¹	N	4.4	<1.0	1.6	<1.0	<1.0	<1.0
	Vanadium	7440622	µg l-¹	U	19	2.8	5.9	2.0	4.1	1.8
	Tungsten	7440337	µg l-¹	N	2750	1800	1070	78	130	8.4
	Yttrium	7440655	µg l-¹	N	14	<1.0	5.5	<1.0	<1.0	1.5
	Zinc	7440666	µg l-¹	U	15	<1.0	15	31	1.2	120
	Zirconium	7440677	µg l-¹	N	12	<1.0	5.0	<1.0	1.3	<1.0
1415	Calcium	7440702	mg l-¹	U	<5.0	<5.0	<5.0	6.3	<5.0	9.9
	Potassium	7440097	mg l-¹	U	3.1	6.5	4.2	18	12	15
	Magnesium	7439954	mg l-¹	U	<0.50	<0.50	<0.50	2.2	1.5	3.2
	Sodium	7440235	mg l-¹	U	43	18	5.2	5.2	6.4	5.6
1220	Sulfate	14808798	mg l-¹	U	3.1	<1	1.2	<1	<1	<1

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					221743					
					AI23228	AI23229	AI23230	AI23231	AI23232	AI23233
					SGS383:0185R	SGS383:0185R	SGS383:0185R	SGS383:0069R	SGS383:0069R	SGS383:0069R
					D	K	H	C	M	L
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Uranium	7440611	µg l-¹	N	1.5	<1.0	12	12	1.6	10
	Vanadium	7440622	µg l-¹	U	13	4.3	4.2	6.2	2.7	21
	Tungsten	7440337	µg l-¹	N	2000	1220	130	255	13	<1.0
	Yttrium	7440655	µg l-¹	N	2.4	3.1	71	4.0	<1.0	5.2
	Zinc	7440666	µg l-¹	U	3.4	4.1	465	13	13	30
	Zirconium	7440677	µg l-¹	N	4.1	5.0	5.6	9.4	1.5	<1.0
1415	Calcium	7440702	mg l-¹	U	<5.0	<5.0	12	<5.0	<5.0	<5.0
	Potassium	7440097	mg l-¹	U	2.3	2.7	14	13	12	38
	Magnesium	7439954	mg l-¹	U	<0.50	<0.50	5.0	<0.50	<0.50	1.0
	Sodium	7440235	mg l-¹	U	17	4.6	6.0	37	1.3	2.1
1220	Sulfate	14808798	mg l-¹	U	2.5	1.5	<1	3.8	<1	< 1.0

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					AI23234	AI23235	AI23236	AI23237	AI23238	AI23239
					SGS383:0069R	SGS383:0069R	SGS383:0069R	SGS383:0069R	SGS383:0069R	SGS383:0069R
					J	N	I	H	E	K
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Uranium	7440611	µg l-¹	N	4.0	<1.0	1.7	11	3.6	5.8
	Vanadium	7440622	µg l-¹	U	4.6	2.9	3.2	2.6	3.8	3.9
	Tungsten	7440337	µg l-¹	N	190	46	2.2	5.7	390	205
	Yttrium	7440655	µg l-¹	N	3.2	<1.0	<1.0	6.2	2.8	3.0
	Zinc	7440666	µg l-¹	U	10	4.2	15	110	7.3	8.9
	Zirconium	7440677	µg l-¹	N	12	4.9	<1.0	<1.0	15	8.1
1415	Calcium	7440702	mg l-¹	U	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Potassium	7440097	mg l-¹	U	20	19	29	36	9.6	14
	Magnesium	7439954	mg l-¹	U	<0.50	<0.50	1.1	1.4	<0.50	<0.50
	Sodium	7440235	mg l-¹	U	1.7	2.6	2.3	2.4	9.7	1.3
1220	Sulfate	14808798	mg l-¹	U	<1	<1	<1	<1	<1	<1

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					221743					
					AI23240	AI23241	AI23242	AI23243	AI23244	AI23245
					SGS383:0182R	SGS383:0182R	SGS383:0182R	SGS383:0182R	SGS383:0182R	SGS383:0182R
					C	L	E	M	J	N
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Uranium	7440611	µg l-¹	N	22	2.1	8.2	8.0	1.7	<1.0
	Vanadium	7440622	µg l-¹	U	11	3.6	3.5	2.9	2.3	1.0
	Tungsten	7440337	µg l-¹	N	1440	960	860	510	46	19
	Yttrium	7440655	µg l-¹	N	21	<1.0	11	12	<1.0	<1.0
	Zinc	7440666	µg l-¹	U	39	2.2	14	11	4.0	1.5
	Zirconium	7440677	µg l-¹	N	15	<1.0	5.8	9.3	<1.0	6.3
1415	Calcium	7440702	mg l-¹	U	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Potassium	7440097	mg l-¹	U	13	7.8	9.5	7.9	24	14
	Magnesium	7439954	mg l-¹	U	1.2	<0.50	<0.50	<0.50	1.2	1.2
	Sodium	7440235	mg l-¹	U	52	30	8.7	3.8	7.5	4.4
1220	Sulfate	14808798	mg l-¹	U	<1	<1	<1	<1	<1	<1

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					221743					
					AI23246	AI23247	AI23248	AI23249	AI23250	AI23251
					SGS383:0182R	SGS383:0182R	SGS383:0182R	SGS383:0183R	SGS383:0183R	SGS383:0183R
					H	K	I	C	E	L
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Uranium	7440611	µg l-¹	N	8.1	11	84	8.3	6.6	1.4
	Vanadium	7440622	µg l-¹	U	1.3	3.6	2.7	11	6.3	3.3
	Tungsten	7440337	µg l-¹	N	22	630	4.7	2050	1110	1500
	Yttrium	7440655	µg l-¹	N	3.4	15	49	7.8	5.1	4.2
	Zinc	7440666	µg l-¹	U	56	18	110	6.4	6.5	5.8
	Zirconium	7440677	µg l-¹	N	3.8	7.8	<1.0	12	6.0	6.6
1415	Calcium	7440702	mg l-¹	U	8.1	<5.0	15	<5.0	<5.0	<5.0
	Potassium	7440097	mg l-¹	U	23	9.1	34	4.8	4.5	2.8
	Magnesium	7439954	mg l-¹	U	2.9	<0.50	3.6	<0.50	<0.50	<0.50
	Sodium	7440235	mg l-¹	U	4.9	3.5	5.1	43	20	8.4
1220	Sulfate	14808798	mg l-¹	U	<1	2.1	<1	3.7	<1	1.4

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					AI23252	AI23253	AI23254	AI23255	AI23256	AI23257
					SGS383:0183R	SGS383:0183R	SGS383:0183R	SGS383:0183R	SGS383:0183R	SGS383:0183R
					M	N	J	H	K	I
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Uranium	7440611	µg l-¹	N	1.6	<1.0	<1.0	5.0	<1.0	59
	Vanadium	7440622	µg l-¹	U	3.2	3.0	1.3	1.7	1.1	2.6
	Tungsten	7440337	µg l-¹	N	860	1080	82	18	195	<1.0
	Yttrium	7440655	µg l-¹	N	5.5	1.6	<1.0	8.8	<1.0	38
	Zinc	7440666	µg l-¹	U	14	2.0	<1.0	33	<1.0	95
	Zirconium	7440677	µg l-¹	N	4.7	4.6	<1.0	<1.0	1.8	<1.0
1415	Calcium	7440702	mg l-¹	U	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Potassium	7440097	mg l-¹	U	6.1	3.3	12	180	9.4	24
	Magnesium	7439954	mg l-¹	U	1.0	<0.50	<0.50	1.8	<0.50	1.9
	Sodium	7440235	mg l-¹	U	6.6	4.6	4.0	3.7	4.0	3.6
1220	Sulfate	14808798	mg l-¹	U	1.6	<1	<1	<1	<1	<1

Chemtest Technical Services
Depot Road
Newmarket
Suffolk
CB8 0AL

FAO S Fisher/J Cutting/ P Hellier

LABORATORY TEST REPORT

Results of analysis of 90 samples
received 4 February 2013

A26086 - pH dependence, Coffey Geotechnic

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					221743					
					AI23258	AI23259	AI23260	AI23261	AI23262	AI23263
					SGS383:0012R	SGS383:0012R	SGS383:0012R	SGS383:0012R	SGS383:0012R	SGS383:0012R
					C	D	E	L	M	H
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Uranium	7440611	µg l-¹	N	4.5	3.1	1.8	3.9	<1.0	4.0
	Vanadium	7440622	µg l-¹	U	6.1	5.4	1.5	2.8	1.2	1.1
	Tungsten	7440337	µg l-¹	N	920	870	640	160	12	4.9
	Yttrium	7440655	µg l-¹	N	9.5	11	7.4	12	<1.0	5.0
	Zinc	7440666	µg l-¹	U	2.1	2.5	2.4	5.4	<1.0	22
	Zirconium	7440677	µg l-¹	N	8.0	9.2	8.6	8.7	1.2	<1.0
1415	Calcium	7440702	mg l-¹	U	<5.0	<5.0	<5.0	<5.0	<5.0	9.3
	Potassium	7440097	mg l-¹	U	5.4	4.3	6.6	8.9	16	23
	Magnesium	7439954	mg l-¹	U	<0.50	<0.50	<0.50	<0.50	1.2	5.6
	Sodium	7440235	mg l-¹	U	35	17	9.7	4.8	5.7	5.6
1220	Sulfate	14808798	mg l-¹	U	2.3	2.4	2.5	<1	<1	<1

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					221743					
					AI23264	AI23265	AI23266	AI23267	AI23268	AI23269
					SGS383:0012R	SGS383:0012R	SGS383:0012R	SGS383:0184R	SGS383:0184R	SGS383:0184R
					K	J	I	C	E	H
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Uranium	7440611	µg l-¹	N	3.7	<1.0	57	9.6	9.1	5.8
	Vanadium	7440622	µg l-¹	U	1.4	1.2	3.1	7.9	7.9	3.3
	Tungsten	7440337	µg l-¹	N	165	12	<1.0	1050	800	<1.0
	Yttrium	7440655	µg l-¹	N	12	<1.0	110	4.9	15	5.8
	Zinc	7440666	µg l-¹	U	3.7	<1.0	44	38	64	370
	Zirconium	7440677	µg l-¹	N	7.5	1.9	<1.0	3.5	4.0	<1.0
1415	Calcium	7440702	mg l-¹	U	<5.0	<5.0	5.7	<5.0	<5.0	15
	Potassium	7440097	mg l-¹	U	7.0	21	28	4.3	6.0	77
	Magnesium	7439954	mg l-¹	U	<0.50	<0.50	5.3	<0.50	1.1	4.1
	Sodium	7440235	mg l-¹	U	3.1	3.8	4.4	32	8.5	4.9
1220	Sulfate	14808798	mg l-¹	U	1.4	<1	<1	4.2	4.2	<1

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					221743					
					AI23270	AI23271	AI23272	AI23273	AI23274	AI23275
					SGS383:0184R	SGS383:0184R	SGS383:0184R	SGS383:0184R	SGS383:0184R	SGS383:0184R
					J	L	M	N	K	I
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Uranium	7440611	µg l-¹	N	2.1	6.4	2.1	<1.0	3.5	30
	Vanadium	7440622	µg l-¹	U	1.9	6.6	1.0	18	3.6	2.2
	Tungsten	7440337	µg l-¹	N	580	1140	730	8	1090	46
	Yttrium	7440655	µg l-¹	N	2.6	<1.0	3.0	<1.0	5.4	56
	Zinc	7440666	µg l-¹	U	9.7	3.6	9.2	5.6	17	600
	Zirconium	7440677	µg l-¹	N	7.9	<1.0	6.0	<1.0	6.1	2.8
1415	Calcium	7440702	mg l-¹	U	<5.0	<5.0	<5.0	<5.0	<5.0	20
	Potassium	7440097	mg l-¹	U	13	5.2	5.8	10	5.9	27
	Magnesium	7439954	mg l-¹	U	1.3	<0.50	<0.50	1.4	<0.50	7.3
	Sodium	7440235	mg l-¹	U	4.5	35	4.2	3.0	3.8	5.9
1220	Sulfate	14808798	mg l-¹	U	<1	<1	1.3	<1	<1	7.7

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					221743					
					AI23276	AI23277	AI23278	AI23279	AI23280	AI23281
					SGS383:0040R	SGS383:0040R	SGS383:0040R	SGS383:0040R	SGS383:0040R	SGS383:0040R
					C	N	E	L	J	H
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Uranium	7440611	µg l-¹	N	7.5	2.5	1.5	1.5	<1.0	12
	Vanadium	7440622	µg l-¹	U	8.2	4.7	3.1	1.8	1.1	2.5
	Tungsten	7440337	µg l-¹	N	790	750	750	460	30	35
	Yttrium	7440655	µg l-¹	N	2.5	1.5	<1.0	3.6	<1.0	1.5
	Zinc	7440666	µg l-¹	U	8.9	4.7	<1.0	4.0	1.0	125
	Zirconium	7440677	µg l-¹	N	5.8	5.2	<1.0	5.3	<1.0	<1.0
1415	Calcium	7440702	mg l-¹	U	<5.0	<5.0	<5.0	<5.0	<5.0	7.6
	Potassium	7440097	mg l-¹	U	5.2	2.9	14	6.7	12	27
	Magnesium	7439954	mg l-¹	U	<0.50	<0.50	<0.50	<0.50	<0.50	3.6
	Sodium	7440235	mg l-¹	U	35	11	20	4.6	5.7	6.3
1220	Sulfate	14808798	mg l-¹	U	1.9	2.5	1.9	1.6	<1	<1

* Accreditation status

This report should be interpreted in conjuction with the notes on the accompanying cover page.

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					221743					
					AI23282	AI23283	AI23284	AI23285	AI23286	AI23287
					SGS383:0040R	SGS383:0040R	SGS383:0040R	SGS383:0142R	SGS383:0142R	SGS383:0142R
					K	I	M	C	K	I
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Uranium	7440611	µg l-¹	N	1.5	1.3	43	5.9	4.9	7.2
	Vanadium	7440622	µg l-¹	U	<1.0	1.3	1.7	27	3.3	2.2
	Tungsten	7440337	µg l-¹	N	405	20	2.9	6300	3750	465
	Yttrium	7440655	µg l-¹	N	2.9	<1.0	10	3.6	1.1	<1.0
	Zinc	7440666	µg l-¹	U	3.7	17	110	17	5.7	<1.0
	Zirconium	7440677	µg l-¹	N	4.4	<1.0	<1.0	24	6.9	1.3
1415	Calcium	7440702	mg l-¹	U	<5.0	<5.0	7.5	<5.0	11	120
	Potassium	7440097	mg l-¹	U	7.4	22	54	4.4	3.1	8.7
	Magnesium	7439954	mg l-¹	U	<0.50	1.9	4.2	<0.50	1.1	5.7
	Sodium	7440235	mg l-¹	U	4.5	6.5	6.3	59	7.5	8.5
1220	Sulfate	14808798	mg l-¹	U	1.1	<1	<1	<1	1.6	2.4

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					221743					
					AI23288	AI23289	AI23290	AI23291	AI23292	AI23293
					SGS383:0142R	SGS383:0142R	SGS383:0142R	SGS383:0142R	SGS383:0142R	SGS383:0142R
					H	F	G	D	E	J
					Not Provided	Not Provided	Not Provided	Not Provided	Not Provided	Not Provided
					WATER	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
6030	Uranium	7440611	µg l-¹	N	1.5	5.3	<1.0	5.6	4.4	3.6
	Vanadium	7440622	µg l-¹	U	29	1.7	6.8	9.8	2.9	18
	Tungsten	7440337	µg l-¹	N	1.9	160	59	4550	3950	2700
	Yttrium	7440655	µg l-¹	N	32	<1.0	1.8	2.3	<1.0	<1.0
	Zinc	7440666	µg l-¹	U	790	5.2	205	8.5	<1.0	5.1
	Zirconium	7440677	µg l-¹	N	<1.0	1.6	<1.0	13	1.5	<1.0
1415	Calcium	7440702	mg l-¹	U	630	300	390	<5.0	12	27
	Potassium	7440097	mg l-¹	U	46	11	14	2.9	3.3	8.0
	Magnesium	7439954	mg l-¹	U	26	11	16	<0.50	<0.50	1.9
	Sodium	7440235	mg l-¹	U	8.7	8.4	8.8	23	11	6.7
1220	Sulfate	14808798	mg l-¹	U	37	1.9	<1	2.3	7.3	3.6

APPENDIX 3C-11

Laboratory Certificates from Total Sulphur Testing (Phase II)

Wheal Jane Laboratory

Wheal Jane Services, Old Mine Offices, Wheal Jane, Baldhu, Truro, Cornwall TR3 6EE
Telephone (01872) 560200, Direct Line (01872) 562023, Facsimile (01872) 562000
E-mail crice@wheal-jane.co.uk

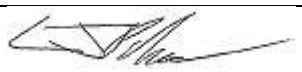
Test Report

WJL ID No: 47540 - 47559
Report No: 13040301b

Sample(s) Received: 01/04/13
Sample(s) Tested: 03/04/13
Tested By: AA
Test Procedure: O2

For the attention of: **Name:** Mike Cook
Company: **SGS**
Subject: Wolf Minerals – Sample Prep

Sample	%S
SGS383	
BH3A	
0266A Sample 1	0.06
0267A Sample 2	0.02
0268A Sample 3	0.24
0269A Sample 4	<0.01
0270A Sample 5	0.06
0271A Sample 6	<0.01
0272A Sample 7	<0.01
0273A Sample 8	<0.01
0274A Sample 9	<0.01
0275A Sample 10	<0.01
BH6	
0296A Sample 1	0.03
0297A Sample 2	0.02
0298A Sample 3	0.01
0299A Sample 4	0.04
0300A Sample 5	0.02
0301A Sample 6	0.01
0302A Sample 7	0.04
0303A Sample 8	<0.01
0304A Sample 9	0.34
0305A Sample 10	0.01

		Authorised Signatories:	Signed by:	Checked by:
Signed		Clifford Rice, Laboratory Director		
		Liam Palmer, Laboratory Manager	**X**	
Dated	03/04/13	Karen Hocking, Systems Technician		**X**

Wheal Jane Laboratory

Wheal Jane Services, Old Mine Offices, Wheal Jane, Baldhu, Truro, Cornwall TR3 6EE
Telephone (01872) 560200, Direct Line (01872) 562023, Facsimile (01872) 562000
E-mail crice@wheal-jane.co.uk

Test Report

WJL ID No: 46876 - 46885
Report No: 13032501d
Sample(s) Received: 14/03/13
Sample(s) Tested: 17/03/13
Tested By: IN
Test Procedure: O2

For the attention of: **Name:** Mike Cook
Company: **SGS**
Subject: Wolf Minerals

Sample	%S
SGS383	
BH2	
0236A Sample 1	0.04
0237A Sample 2	0.26
0238A Sample 3	0.02
0239A Sample 4	0.01
0240A Sample 5	0.04
0241A Sample 6	0.02
0242A Sample 7	0.05
0243A Sample 8	0.02
0244A Sample 9	0.08
0245A Sample 10	0.02

Signed		Authorised Signatories:	Signed by:	Checked by:
		Clifford Rice, Laboratory Director	X	
		Liam Palmer, Laboratory Manager		
Dated	25/03/13	Karen Hocking, Systems Technician		X

Wheal Jane Laboratory

Wheal Jane Services, Old Mine Offices, Wheal Jane, Baldhu, Truro, Cornwall TR3 6EE
Telephone (01872) 560200, Direct Line (01872) 562023, Facsimile (01872) 562000
E-mail crice@wheal-jane.co.uk

Test Report

WJL ID No: 45711 - 45720
Report No: 13031101a
Sample(s) Received: 08/03/13
Sample(s) Tested: 08-10/03/13
Tested By: IN
Test Procedure: O2

For the attention of: **Name:** Mike Cook
Company: **SGS**
Subject: Wolf Minerals – Sample Prep

Sample	%S
SGS383	
BH5	
0206A Sample 1	0.04
0207A Sample 2	0.01
0208A Sample 3	0.02
0209A Sample 4	0.01
0210A Sample 5	0.06
0211A Sample 6	0.07
0212A Sample 7	0.01
0213A Sample 8	<0.01
0214A Sample 9	0.02
0215A Sample 10	<0.01

		Authorised Signatories:	Signed by:	Checked by:
Signed		Clifford Rice, Laboratory Director	X	
		Liam Palmer, Laboratory Manager		
Dated	11/03/13	Karen Hocking, Systems Technician		X

Wheal Jane Laboratory

Wheal Jane Services, Old Mine Offices, Wheal Jane, Baldhu, Truro, Cornwall TR3 6EE
Telephone (01872) 560200, Direct Line (01872) 562023, Facsimile (01872) 562000
E-mail crice@wheal-jane.co.uk

Test Report

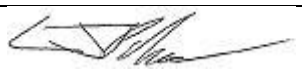
WJL ID No: 47838 - 47857
Report No: 13040901a

Sample(s) Received: 04/04/13
Sample(s) Tested: 09/04/13

Tested By: AA
Test Procedure: O2

For the attention of: **Name:** N MacDonald
Company: **SGS**
Subject: Hemerdon GeoMet Samples

Sample		%S
SGS383		
BH1		
0326	Sample 1	0.03
0327	Sample 2	0.02
0328	Sample 3	0.01
0329	Sample 4	0.01
0330	Sample 5	0.06
0331	Sample 6	0.03
0332	Sample 7	0.02
0333	Sample 8	0.01
0334	Sample 9	0.03
0335	Sample 10	0.02
BH4		
0356	Sample 1	0.03
0357	Sample 2	0.17
0358	Sample 3	0.11
0359	Sample 4	0.04
0360	Sample 5	0.02
0361	Sample 6	0.01
0362	Sample 7	0.02
0363	Sample 8	0.03
0364	Sample 9	0.09
0365	Sample 10	0.50

Signed		Authorised Signatories:	Signed by:	Checked by:
		Clifford Rice, Laboratory Director		
		Liam Palmer, Laboratory Manager	**X**	
Dated	09/04/13	Karen Hocking, Systems Technician		**X**

APPENDIX 3C-12

Factual report from ICP and EN BS 12457-3 Testing (Phase II)

ALcontrol Laboratories

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: mkt@alcontrol.com
Website: www.alcontrol.com

Coffey Geotechnics Limited
9/11 Hornbeam Square South
Hornbeam Park
Harrogate
North Yorkshire
HG2 8NB

Attention: Lesley MacCormack

CERTIFICATE OF ANALYSIS

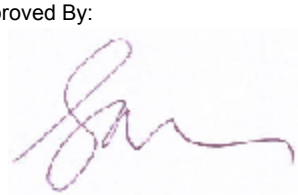
Date:	24 April 2013
Customer:	H_COFFEYGEO_HGT
Sample Delivery Group (SDG):	130411-9
Your Reference:	
Location:	Leachate Analysis
Report No:	221669

We received 10 samples on Wednesday April 10, 2013 and 10 of these samples were scheduled for analysis which was completed on Wednesday April 24, 2013. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
7215324	SGS 383: 0316 BH1 Sample 1		0.00	08/04/2013
7215325	SGS 383: 0317 BH1 Sample 2		0.00	08/04/2013
7215327	SGS 383: 0318 BH1 Sample 3		0.00	08/04/2013
7215328	SGS 383: 0319 BH1 Sample 4		0.00	08/04/2013
7215329	SGS 383: 0320 BH1 Sample 5		0.00	08/04/2013
7215331	SGS 383: 0321 BH1 Sample 6		0.00	08/04/2013
7215332	SGS 383: 0322 BH1 Sample 7		0.00	08/04/2013
7215333	SGS 383: 0323 BH1 Sample 8		0.00	08/04/2013
7215334	SGS 383: 0324 BH1 Sample 9		0.00	08/04/2013
7215336	SGS 383: 0325 BH1 Sample 10		0.00	08/04/2013

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

SOLID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			7215324	SGS 383: 0316 BH1		0.00	BAG
			7215325	SGS 383: 0317 BH1		0.00	BAG
			7215327	SGS 383: 0318 BH1		0.00	BAG
			7215328	SGS 383: 0319 BH1		0.00	BAG
			7215329	SGS 383: 0320 BH1		0.00	BAG
			7215331	SGS 383: 0321 BH1		0.00	BAG
			7215332	SGS 383: 0322 BH1		0.00	BAG
			7215333	SGS 383: 0323 BH1		0.00	BAG
			7215334	SGS 383: 0324 BH1		0.00	BAG
			7215336	SGS 383: 0325 BH1		0.00	BAG
Alkali Metals by iCap-OES (Soil)	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
CEN 2:1 Readings	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
CEN 8:1 Readings	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Dissolved W, Nb and Zr by ICP-MS	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Fluoride	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Mercury Dissolved	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Metals in solid samples by OES	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Metals Ultra Low	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
pH Value of Filtered Water	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Sample description	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Silver	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Total Dissolved Solids	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X

CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
7215324	SGS 383: 0316 BH1 Sample 1	0.00	Light Brown	Dry Sample Received	0.1 - 2 mm	None	None
7215325	SGS 383: 0317 BH1 Sample 2	0.00	Light Brown	Dry Sample Received	2 - 10 mm	Stones	None
7215327	SGS 383: 0318 BH1 Sample 3	0.00	Light Brown	Dry Sample Received	0.1 - 2 mm	None	None
7215328	SGS 383: 0319 BH1 Sample 4	0.00	Light Brown	Dry Sample Received	2 - 10 mm	Stones	None
7215329	SGS 383: 0320 BH1 Sample 5	0.00	Light Brown	Dry Sample Received	0.1 - 2 mm	None	None
7215331	SGS 383: 0321 BH1 Sample 6	0.00	Light Brown	Dry Sample Received	0.1 - 2 mm	Stones	None
7215332	SGS 383: 0322 BH1 Sample 7	0.00	Beige	Dry Sample Received	0.1 - 2 mm	Stones	None
7215333	SGS 383: 0323 BH1 Sample 8	0.00	Light Brown	Dry Sample Received	0.1 - 2 mm	Stones	None
7215334	SGS 383: 0324 BH1 Sample 9	0.00	Light Brown	Dry Sample Received	0.1 - 2 mm	Stones	None
7215336	SGS 383: 0325 BH1 Sample 10	0.00	Light Brown	Dry Sample Received	0.1 - 2 mm	N/A	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	SGS 383: 0316 B H1 Sample 1	SGS 383: 0317 B H1 Sample 2	SGS 383: 0318 B H1 Sample 3	SGS 383: 0319 B H1 Sample 4	SGS 383: 0320 B H1 Sample 5	SGS 383: 0321 B H1 Sample 6
			Depth (m)	0.00	0.00	0.00	0.00	0.00	0.00
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	08/04/2013	08/04/2013	08/04/2013	08/04/2013	08/04/2013	08/04/2013
			Sample Time	.	.	.	.	.	.
			Date Received	10/04/2013	10/04/2013	10/04/2013	10/04/2013	10/04/2013	10/04/2013
			SDG Ref	130411-9	130411-9	130411-9	130411-9	130411-9	130411-9
			Lab Sample No.(s)	7215324	7215325	7215327	7215328	7215329	7215331
			AGS Reference						
Aluminium	<11 mg/kg	TM181		48800	12600	4180	5820	2690	4500
Antimony	<0.6 mg/kg	TM181		<0.6 #	8.49 #	3.67 #	3 #	6.49 #	5.35 #
Arsenic	<0.6 mg/kg	TM181		813 #	997 #	500 #	482 #	427 #	543 #
Barium	<0.6 mg/kg	TM181		66.5 #	63 #	33.4 #	10.7 #	11.3 #	41 #
Beryllium	<0.01 mg/kg	TM181		4.16 #	2.44 #	1.69 #	2.95 #	1.26 #	1.93 #
Boron	<0.7 mg/kg	TM181		0.757 #	4.79 #	4.18 #	4.07 #	2.38 #	4.54 #
Cadmium	<0.02 mg/kg	TM181		0.875 #	3.59 #	<0.02 #	<0.02 #	<0.02 #	<0.02 #
Chromium	<0.9 mg/kg	TM181		59.5 #	33.9 #	36.2 #	44.8 #	22.7 #	36.3 #
Cobalt	<0.1 mg/kg	TM181		21.7 #	4.17 #	26.2 #	1.36 #	1.14 #	0.986 #
Copper	<1.4 mg/kg	TM181		549 #	167 #	78.9 #	297 #	75.6 #	62.1 #
Iron	<1000 mg/kg	TM181		28200 #	18200 #	31800 #	58400 #	25000 #	40400 #
Lead	<0.7 mg/kg	TM181		18.5 #	18 #	3.86 #	3.12 #	4.25 #	4.87 #
Manganese	<0.13 mg/kg	TM181		165 #	55.8 #	81.3 #	11.3 #	24.7 #	25.4 #
Mercury	<0.14 mg/kg	TM181		<0.14 #	<0.14 #	<0.14 #	<0.14 #	<0.14 #	<0.14 #
Molybdenum	<0.1 mg/kg	TM181		2.54 #	6.21 #	7.63 #	16.4 #	4.63 #	7.86 #
Nickel	<0.2 mg/kg	TM181		43.9 #	5.7 #	3 #	7.09 #	4.3 #	2.99 #
Phosphorus	<1 mg/kg	TM181		3360	684	596	663	358	623
Selenium	<1 mg/kg	TM181		<1 #	<1 #	1.57 #	<1 #	<1 #	3.01 #
Strontium	<0.4 mg/kg	TM181		20.8 #	60.3 #	15.3 #	3.3 #	2.96 #	15.1 #
Tin	<0.24 mg/kg	TM181		109 #	69.5 #	16.9 #	3.54 #	6.87 #	16.2 #
Thallium	<0.7 mg/kg	TM181		<0.7 #	<0.7 #	<0.7 #	<0.7 #	<0.7 #	<0.7 #
Titanium	<0.1 mg/kg	TM181		2100	1210	481	469	360	493
Vanadium	<0.2 mg/kg	TM181		227 #	227 #	52.1 #	70.8 #	32.3 #	55.3 #
Zinc	<1.9 mg/kg	TM181		381 #	22.2 #	12.5 #	19.9 #	11.5 #	13.5 #
Calcium	<21 mg/kg	TM224		4330	519	162	163	186	180
Sodium	<7 mg/kg	TM224		45.6	<7	<7	<7	11.7	222
Magnesium	<8 mg/kg	TM224		8900	440	272	311	213	205
Potassium	<16 mg/kg	TM224		5820	886	1180	1250	1270	996
Silver	<10 mg/kg	TM250		<10	<10	<10	<10	<10	<10

CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	SGS 383: 0322 B H1 Sample 7	SGS 383: 0323 B H1 Sample 8	SGS 383: 0324 B H1 Sample 9	SGS 383: 0325 B H1 Sample 10		
			Depth (m)	0.00	0.00	0.00	0.00		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	08/04/2013	08/04/2013	08/04/2013	08/04/2013		
			Sample Time	.	.	.	.		
			Date Received	10/04/2013	10/04/2013	10/04/2013	10/04/2013		
			SDG Ref	130411-9	130411-9	130411-9	130411-9		
			Lab Sample No.(s)	7215332	7215333	7215334	7215336		
			AGS Reference						
Aluminium	<11 mg/kg	TM181		4680	4140	3430	5810		
Antimony	<0.6 mg/kg	TM181		10.9 #	11.8 #	9.05 #	12.9 #		
Arsenic	<0.6 mg/kg	TM181		384 #	478 #	95.1 #	226 #		
Barium	<0.6 mg/kg	TM181		29.4 #	32 #	80.5 #	42.1 #		
Beryllium	<0.01 mg/kg	TM181		2.39 #	1.54 #	0.581 #	1.35 #		
Boron	<0.7 mg/kg	TM181		8.53 #	4.02 #	3.73 #	13.9 #		
Cadmium	<0.02 mg/kg	TM181		<0.02 #	<0.02 #	<0.02 #	<0.02 #		
Chromium	<0.9 mg/kg	TM181		14.5 #	22.8 #	4.87 #	14.9 #		
Cobalt	<0.1 mg/kg	TM181		2.19 #	1.69 #	0.862 #	1.97 #		
Copper	<1.4 mg/kg	TM181		113 #	57.9 #	18.9 #	39.5 #		
Iron	<1000 mg/kg	TM181		23300 #	24600 #	7960 #	20000 #		
Lead	<0.7 mg/kg	TM181		2.43 #	2.26 #	4.66 #	4.28 #		
Manganese	<0.13 mg/kg	TM181		45.5 #	24.4 #	28.4 #	73.2 #		
Mercury	<0.14 mg/kg	TM181		<0.14 #	<0.14 #	<0.14 #	<0.14 #		
Molybdenum	<0.1 mg/kg	TM181		3.73 #	2.66 #	0.569 #	2.18 #		
Nickel	<0.2 mg/kg	TM181		7.7 #	4.59 #	2.77 #	6.26 #		
Phosphorus	<1 mg/kg	TM181		469	359	182	246		
Selenium	<1 mg/kg	TM181		3.31 #	2.89 #	1.22 #	1.67 #		
Strontium	<0.4 mg/kg	TM181		11.3 #	7.19 #	20.5 #	7.66 #		
Tin	<0.24 mg/kg	TM181		8.71 #	12.9 #	4.38 #	11.8 #		
Thallium	<0.7 mg/kg	TM181		<0.7 #	<0.7 #	<0.7 #	<0.7 #		
Titanium	<0.1 mg/kg	TM181		264	387	148	314		
Vanadium	<0.2 mg/kg	TM181		24.8 #	32 #	8.71 #	28.5 #		
Zinc	<1.9 mg/kg	TM181		35.4 #	14.1 #	8.54 #	20.7 #		
Calcium	<21 mg/kg	TM224		490	216	772	433		
Sodium	<7 mg/kg	TM224		52.4	12.8	<7	12.9		
Magnesium	<8 mg/kg	TM224		458	349	569	901		
Potassium	<16 mg/kg	TM224		2020	1930	1670	3230		
Silver	<10 mg/kg	TM250		<10	<10	<10	<10		

CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	1.32
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215324			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0316 BH1 Sample 1			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.0191	0.0265	0.0382	0.257	0.5	2	25
Barium	0.0684	0.00486	0.137	0.121	20	100	300
Cadmium	0.000918	0.000119	0.00184	0.0021	0.04	1	5
Chromium	<0.00022	0.00372	<0.00044	0.033	0.5	10	70
Copper	0.185	0.0227	0.37	0.412	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	<0.00024	0.000345	<0.00048	0.00306	0.5	10	30
Nickel	0.0115	0.00394	0.0231	0.0481	0.4	10	40
Lead	0.00155	0.00516	0.00311	0.0474	0.5	10	50
Antimony	<0.00016	0.000782	<0.00032	0.00693	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000781	<0.0039	0.1	0.5	7
Zinc	0.0672	0.00845	0.134	0.152	4	50	200
Chloride	45.3	6.1	90.7	106	800	15000	25000
Fluoride	0.602	<0.5	1.21	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	132	21.5	265	341	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	4.835	6.138
Conductivity (µS/cm)	177.70	22.40
Temperature (°C)	21.00	19.50
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.200	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
24/04/2013 09:03:16

09:01:52 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	1.32
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215324			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0316 BH1 Sample 1			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	4.46	4.9	8.9	49	-	-	-
Aluminium	0.926	0.114	1.85	2.06	-	-	-
Calcium	6.83	0.469	13.7	12	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	0.000946	0.000114	0.00189	0.00209	-	-	-
Sodium	5.63	0.638	11.3	12.1	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	8.49	1.04	17	18.9	-	-	-
Tungsten	<0.0015	0.00179	<0.003	0.0158	-	-	-
Potassium	<2.34	<2.34	<4.68	<23.4	-	-	-
Beryllium	0.00304	0.000448	0.00608	0.00744	-	-	-
Iron	<0.019	<0.019	<0.038	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	<0.0094	<0.0094	<0.0188	<0.094	-	-	-
Cobalt	0.00721	0.00103	0.0144	0.0173	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.121	0.0229	0.242	0.341	-	-	-
Manganese	0.092	0.0127	0.184	0.218	-	-	-
Phosphorus	0.0247	0.0371	0.0494	0.357	-	-	-
Strontium	0.0684	0.00928	0.137	0.16	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	4.835	6.138
Conductivity (µS/cm)	177.70	22.40
Temperature (°C)	21.00	19.50
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.200	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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24/04/2013 09:03:16

09:01:52 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	1.32
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215324			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0316 BH1 Sample 1			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	<0.00036	<0.00036	<0.000721	<0.0036	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00397	<0.0015	0.00794	<0.015	-	-	-
Vanadium	<0.00024	0.000517	<0.00048	0.00458	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	4.835	6.138
Conductivity (µS/cm)	177.70	22.40
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09:01:52 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.634
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.4
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215325			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0317 BH1 Sample 2			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.139	0.193	0.278	1.86	0.5	2	25
Barium	0.00192	<0.00003	0.00385	0.00241	20	100	300
Cadmium	0.000307	<0.0001	0.000614	<0.001	0.04	1	5
Chromium	0.00253	0.00246	0.00506	0.0247	0.5	10	70
Copper	0.00704	0.000951	0.0141	0.0172	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.000353	0.000312	0.000706	0.00317	0.5	10	30
Nickel	0.000426	0.000923	0.000852	0.00861	0.4	10	40
Lead	0.000975	0.000626	0.00195	0.0067	0.5	10	50
Antimony	0.000753	0.000457	0.00151	0.00494	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.00078	<0.0039	0.1	0.5	7
Zinc	0.00182	0.00189	0.00364	0.0188	4	50	200
Chloride	10.3	<2	20.6	-	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	37.7	9.41	75.4	-	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.076	7.205
Conductivity (µS/cm)	45.10	10.22
Temperature (°C)	20.50	17.10
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.220	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.634
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.4
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215325			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0317 BH1 Sample 2			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	5.88	5.83	12	-	-	-	-
Aluminium	0.0571	0.136	0.114	1.26	-	-	-
Calcium	0.598	<0.012	1.2	0.752	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	0.000264	0.0000225	0.000528	0.000528	-	-	-
Sodium	4.75	1.01	9.5	14.8	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.719	0.0826	1.44	1.63	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	2.43	<2.34	4.87	<23.4	-	-	-
Beryllium	0.000169	<0.00007	0.000338	<0.0007	-	-	-
Iron	<0.019	0.0258	<0.038	0.226	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0163	<0.0094	0.0326	<0.094	-	-	-
Cobalt	0.000193	0.000083	0.000386	0.000968	-	-	-
Sulphate (soluble) as S	<1	<1	<2	-	-	-	-
Lithium	0.00524	0.00305	0.0105	0.0332	-	-	-
Manganese	0.00414	0.00084	0.00829	0.0125	-	-	-
Phosphorus	0.119	0.151	0.237	1.47	-	-	-
Strontium	0.00712	0.000937	0.0142	0.0171	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.076	7.205
Conductivity (µS/cm)	45.10	10.22
Temperature (°C)	20.50	17.10
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.220	

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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.634
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.4
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215325			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0317 BH1 Sample 2			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	<0.00036	<0.00036	<0.00072	<0.0036	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00279	0.00196	0.00559	0.0206	-	-	-
Vanadium	0.00142	0.00254	0.00284	0.024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.076	7.205
Conductivity (µS/cm)	45.10	10.22
Temperature (°C)	20.50	17.10
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.220	

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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.241
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215327			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0318 BH1 Sample 3			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.0197	0.0176	0.0394	0.179	0.5	2	25
Barium	0.00124	<0.00003	0.00248	0.00177	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000248	0.00416	0.000497	0.036	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00372	0.00309	0.00746	0.0318	0.5	10	30
Nickel	<0.00015	0.0026	<0.0003	0.0223	0.4	10	40
Lead	0.00433	0.00269	0.00866	0.0293	0.5	10	50
Antimony	<0.00016	0.000832	<0.00032	0.00713	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000781	<0.0039	0.1	0.5	7
Zinc	<0.00041	<0.00041	<0.000821	<0.0041	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	1.31	0.917	2.62	9.73	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	21.5	8.17	43.1	101	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	6.483	6.721
Conductivity (µS/cm)	22.50	8.47
Temperature (°C)	20.60	18.90
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.250	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.241
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215327			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0318 BH1 Sample 3			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.71	6.5	13	65	-	-	-
Aluminium	0.0434	0.0563	0.0868	0.545	-	-	-
Calcium	0.154	<0.012	0.308	0.22	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	<0.00001	<0.00001	<0.00002	<0.0001	-	-	-
Sodium	0.888	0.181	1.78	2.82	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.127	0.0435	0.253	0.554	-	-	-
Tungsten	0.00154	0.00289	0.00309	0.027	-	-	-
Potassium	4.23	2.81	8.47	30.2	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0347	0.0235	0.0695	0.251	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0924	0.0339	0.185	0.423	-	-	-
Cobalt	0.000072	<0.00006	0.000144	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0147	0.00502	0.0294	0.064	-	-	-
Manganese	0.00456	0.00127	0.00914	0.0174	-	-	-
Phosphorus	0.0103	0.0107	0.0206	0.107	-	-	-
Strontium	0.00518	0.000435	0.0104	0.0111	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	6.483	6.721
Conductivity (µS/cm)	22.50	8.47
Temperature (°C)	20.60	18.90
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.250	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.241
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215327			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0318 BH1 Sample 3			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	<0.00036	<0.00036	<0.000721	<0.0036	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.0021	<0.0015	0.0042	<0.015	-	-	-
Vanadium	0.000588	0.000398	0.00118	0.00425	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	6.483	6.721
Conductivity (µS/cm)	22.50	8.47
Temperature (°C)	20.60	18.90
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.250	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.341
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215328			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0319 BH1 Sample 4			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.0186	0.0194	0.0371	0.192	0.5	2	25
Barium	0.000467	0.558	0.000933	4.72	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000319	0.000401	0.000637	0.00388	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00497	0.00479	0.00994	0.0482	0.5	10	30
Nickel	<0.00015	<0.00015	<0.0003	<0.0015	0.4	10	40
Lead	<0.00002	<0.00002	<0.00004	<0.0002	0.5	10	50
Antimony	<0.00016	0.00019	<0.00032	0.00161	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	<0.00041	<0.00041	<0.000819	<0.0041	4	50	200
Chloride	<2	<2	<4	-	800	15000	25000
Fluoride	1.08	0.777	2.15	8.24	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	13.6	7.67	27.1	-	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.880	7.149
Conductivity (µS/cm)	13.25	7.29
Temperature (°C)	20.90	18.60
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.270	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.341
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215328			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0319 BH1 Sample 4			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.62	6.6	13	66	-	-	-
Aluminium	0.0732	0.036	0.146	0.417	-	-	-
Calcium	<0.012	<0.012	<0.024	<0.12	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	<0.00001	<0.00001	<0.00002	<0.0001	-	-	-
Sodium	0.732	0.125	1.46	2.18	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	<0.036	<0.036	<0.0719	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	2.8	<2.34	5.59	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.146	0.0498	0.292	0.646	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0234	<0.0094	0.0468	<0.094	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	-	-	-	-
Lithium	0.00738	0.00219	0.0148	0.0299	-	-	-
Manganese	0.00126	0.000206	0.00251	0.00369	-	-	-
Phosphorus	0.0387	0.028	0.0773	0.296	-	-	-
Strontium	0.000645	0.000416	0.00129	0.00451	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.880	7.149
Conductivity (µS/cm)	13.25	7.29
Temperature (°C)	20.90	18.60
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.270	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.341
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215328			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0319 BH1 Sample 4			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	<0.00036	<0.00036	<0.000719	<0.0036	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00293	<0.0015	0.00585	<0.015	-	-	-
Vanadium	0.00126	0.00038	0.00252	0.00516	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.880	7.149
Conductivity (µS/cm)	13.25	7.29
Temperature (°C)	20.90	18.60
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.270	

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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.321
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215329			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0320 BH1 Sample 5			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.0371	0.0461	0.0741	0.449	0.5	2	25
Barium	0.00468	<0.00003	0.00934	0.00628	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000513	0.000997	0.00102	0.00932	0.5	10	70
Copper	0.00103	<0.00085	0.00206	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.017	0.0121	0.0339	0.128	0.5	10	30
Nickel	0.000227	0.000548	0.000453	0.00505	0.4	10	40
Lead	0.00438	0.00183	0.00876	0.0217	0.5	10	50
Antimony	0.000418	0.00056	0.000835	0.00541	0.06	0.7	5
Selenium	0.000421	0.000528	0.000841	0.00514	0.1	0.5	7
Zinc	0.00156	<0.00041	0.00312	<0.0041	4	50	200
Chloride	<2	<2	<3.99	<20	800	15000	25000
Fluoride	2.19	1.1	4.36	12.4	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	52.2	17.1	104	218	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.652	8.329
Conductivity (µS/cm)	58.00	14.71
Temperature (°C)	21.00	16.80
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.235	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.321
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215329			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0320 BH1 Sample 5			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	7.72	7.9	15	78	-	-	-
Aluminium	0.0787	0.0465	0.157	0.508	-	-	-
Calcium	3.5	2.32	7	24.8	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	0	0.0000114	0.0000423	0.000127	-	-	-
Sodium	1.18	<0.076	2.36	1.58	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.501	0.0939	1	1.49	-	-	-
Tungsten	0.00331	0.00426	0.00661	0.0413	-	-	-
Potassium	8.08	3.15	16.1	38.1	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0733	0.0748	0.146	0.746	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0277	0.00951	0.0554	0.12	-	-	-
Cobalt	0.000061	<0.00006	0.000122	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0231	0.00673	0.0461	0.0893	-	-	-
Manganese	0.00124	0.000433	0.00248	0.00541	-	-	-
Phosphorus	0.0526	0.037	0.105	0.391	-	-	-
Strontium	0.0216	0.0116	0.0432	0.129	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.652	8.329
Conductivity (µS/cm)	58.00	14.71
Temperature (°C)	21.00	16.80
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.235	

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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.321
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
SDG	130411-9			
Lab Sample Number(s)	7215329			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0320 BH1 Sample 5			
Depth (m)	0.00			
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	<0.00036	<0.00036	<0.000719	<0.0036	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00266	0.0023	0.00532	0.0234	-	-	-
Vanadium	0.00039	0.000347	0.000779	0.00353	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.652	8.329
Conductivity (µS/cm)	58.00	14.71
Temperature (°C)	21.00	16.80
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.235	

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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.291
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case	
SDG	130411-9
Lab Sample Number(s)	7215331
Sampled Date	08-Apr-2013
Customer Sample Ref.	SGS 383: 0321 BH1 Sample 6
Depth (m)	0.00

Solid Waste Analysis		**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.022	0.0236	0.044	0.233	0.5	2	25
Barium	0.00146	<0.00003	0.00292	0.00229	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000388	0.00199	0.000775	0.0174	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00484	0.00308	0.00967	0.0335	0.5	10	30
Nickel	<0.00015	0.00109	<0.0003	0.0092	0.4	10	40
Lead	0.000318	0.000042	0.000635	0.000854	0.5	10	50
Antimony	0.00256	0.00111	0.0051	0.0133	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	<0.00041	<0.00041	<0.000819	<0.0041	4	50	200
Chloride	<2	<2	<3.99	<20	800	15000	25000
Fluoride	1.86	0.869	3.72	10.2	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	27.1	8.05	54.1	110	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.598	6.616
Conductivity (µS/cm)	32.00	6.86
Temperature (°C)	21.00	19.20
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.275	

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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.291
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215331			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0321 BH1 Sample 6			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.96	6.4	14	65	-	-	-
Aluminium	0.0442	0.0773	0.0883	0.721	-	-	-
Calcium	0.281	<0.012	0.561	0.442	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	<0.00001	<0.00001	<0.00002	<0.0001	-	-	-
Sodium	0.911	<0.076	1.82	1.43	-	-	-
Zirconium	<0.002	<0.002	<0.00399	<0.02	-	-	-
Magnesium	0.0856	<0.036	0.171	<0.36	-	-	-
Tungsten	0.0164	0.0164	0.0327	0.164	-	-	-
Potassium	6.01	2.86	12	33.5	-	-	-
Beryllium	0.000157	<0.00007	0.000314	<0.0007	-	-	-
Iron	0.0927	0.0481	0.185	0.551	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0398	0.0177	0.0794	0.211	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.00974	0.00248	0.0194	0.0362	-	-	-
Manganese	0.00336	0.000723	0.00672	0.0114	-	-	-
Phosphorus	0.0186	0.015	0.0372	0.156	-	-	-
Strontium	0.00465	0.000318	0.00928	0.00999	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.598	6.616
Conductivity (µS/cm)	32.00	6.86
Temperature (°C)	21.00	19.20
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.275	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.291
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215331			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0321 BH1 Sample 6			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	0.000753	0.000459	0.0015	0.00505	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.0042	0.00225	0.00839	0.0255	-	-	-
Vanadium	0.000334	0.00044	0.000667	0.00423	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.598	6.616
Conductivity (µS/cm)	32.00	6.86
Temperature (°C)	21.00	19.20
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.275	

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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.291
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215332			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0322 BH1 Sample 7			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.0365	0.0291	0.073	0.302	0.5	2	25
Barium	0.00137	<0.00003	0.00273	0.00204	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000279	0.000347	0.000557	0.00337	0.5	10	70
Copper	0.000919	<0.00085	0.00184	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00488	0.00424	0.00975	0.0434	0.5	10	30
Nickel	<0.00015	<0.00015	<0.0003	<0.0015	0.4	10	40
Lead	0.00224	0.00022	0.00447	0.0052	0.5	10	50
Antimony	0.00127	0.00549	0.00254	0.0486	0.06	0.7	5
Selenium	<0.00039	0.000694	<0.000779	0.00591	0.1	0.5	7
Zinc	<0.00041	<0.00041	<0.000819	<0.0041	4	50	200
Chloride	<2	<2	<3.99	<20	800	15000	25000
Fluoride	2.39	1.02	4.78	12.3	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	24.3	13.5	48.5	151	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.602	7.607
Conductivity (µS/cm)	2,506.00	6.71
Temperature (°C)	20.10	19.60
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.260	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.291
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215332			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0322 BH1 Sample 7			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.81	6.7	14	67	-	-	-
Aluminium	0.151	0.0658	0.301	0.784	-	-	-
Calcium	<0.012	0.0265	<0.024	0.226	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	<0.00001	<0.00001	<0.00002	<0.0001	-	-	-
Sodium	3.48	0.152	6.95	6.46	-	-	-
Zirconium	<0.002	<0.002	<0.00399	<0.02	-	-	-
Magnesium	0.041	<0.036	0.0819	<0.36	-	-	-
Tungsten	0.0425	0.0375	0.0849	0.383	-	-	-
Potassium	3.88	<2.34	7.75	<23.4	-	-	-
Beryllium	<0.00007	0.000101	<0.00014	0.00086	-	-	-
Iron	0.0735	<0.019	0.147	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.132	0.046	0.264	0.588	-	-	-
Cobalt	0.000065	<0.00006	0.00013	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0142	0.00598	0.0283	0.072	-	-	-
Manganese	0.000779	0.000175	0.00156	0.00265	-	-	-
Phosphorus	0.0404	0.015	0.0806	0.188	-	-	-
Strontium	0.00121	0.000137	0.00242	0.00296	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.602	7.607
Conductivity (µS/cm)	2,506.00	6.71
Temperature (°C)	20.10	19.60
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.260	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.291
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215332			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0322 BH1 Sample 7			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	<0.00036	0.00198	<0.000719	0.0169	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00211	<0.0015	0.00421	<0.015	-	-	-
Vanadium	0.000353	0.00035	0.000705	0.0035	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.602	7.607
Conductivity (µS/cm)	2,506.00	6.71
Temperature (°C)	20.10	19.60
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.260	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.291
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215333			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0323 BH1 Sample 8			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.0428	0.0344	0.0855	0.356	0.5	2	25
Barium	0.000882	<0.00003	0.00176	0.00134	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000339	0.000298	0.000677	0.00304	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00198	0.00131	0.00396	0.0141	0.5	10	30
Nickel	<0.00015	<0.00015	<0.0003	<0.0015	0.4	10	40
Lead	0.000604	<0.00002	0.00121	0.000915	0.5	10	50
Antimony	0.000844	0.000489	0.00169	0.00543	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	<0.00041	<0.00041	<0.000819	<0.0041	4	50	200
Chloride	<2	<2	<3.99	<20	800	15000	25000
Fluoride	2.25	1.01	4.5	12	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	22.4	7.94	44.7	101	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.918	7.646
Conductivity (µS/cm)	25.40	8.90
Temperature (°C)	20.20	18.80
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.265	

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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.291
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215333			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0323 BH1 Sample 8			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.8	6.7	14	67	-	-	-
Aluminium	0.0971	0.0438	0.194	0.518	-	-	-
Calcium	0.0382	<0.012	0.0763	<0.12	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	<0.00001	<0.00001	<0.00002	<0.0001	-	-	-
Sodium	1.07	<0.076	2.14	1.62	-	-	-
Zirconium	<0.002	<0.002	<0.00399	<0.02	-	-	-
Magnesium	<0.036	<0.036	<0.0719	<0.36	-	-	-
Tungsten	0.0286	0.0238	0.0571	0.245	-	-	-
Potassium	5.22	2.95	10.4	33	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.102	0.0312	0.203	0.419	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0614	0.0176	0.123	0.242	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0149	0.00495	0.0297	0.0645	-	-	-
Manganese	0.000321	0.000288	0.000641	0.00293	-	-	-
Phosphorus	0.023	0.00757	0.0458	0.099	-	-	-
Strontium	0.00221	0.000103	0.00441	0.00422	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.918	7.646
Conductivity (µS/cm)	25.40	8.90
Temperature (°C)	20.20	18.80
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.265	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.291
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215333			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0323 BH1 Sample 8			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	<0.00036	<0.00036	<0.000719	<0.0036	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00462	0.00179	0.00923	0.0222	-	-	-
Vanadium	0.00035	0.000668	0.000699	0.0062	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.918	7.646
Conductivity (µS/cm)	25.40	8.90
Temperature (°C)	20.20	18.80
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.265	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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09:01:52 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.301
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case	
SDG	130411-9
Lab Sample Number(s)	7215334
Sampled Date	08-Apr-2013
Customer Sample Ref.	SGS 383: 0324 BH1 Sample 9
Depth (m)	0.00

Solid Waste Analysis		**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.0274	0.0176	0.0547	0.19	0.5	2	25
Barium	0.00212	<0.00003	0.00423	0.00297	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000276	0.000291	0.000551	0.00289	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	0.0000104	<0.00001	0.0000208	<0.0001	0.01	0.2	2
Molybdenum	0.000824	0.000399	0.00165	0.00458	0.5	10	30
Nickel	<0.00015	0.000278	<0.0003	0.00239	0.4	10	40
Lead	0.0857	<0.00002	0.171	0.12	0.5	10	50
Antimony	0.00121	0.000467	0.00242	0.00571	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	0.00668	<0.00041	0.0133	0.00935	4	50	200
Chloride	<2	<2	<3.99	-	800	15000	25000
Fluoride	2.6	1.11	5.19	13.1	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	32.6	8.58	65.1	-	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.886	8.056
Conductivity (µS/cm)	39.00	9.56
Temperature (°C)	20.80	18.40
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.245	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.301
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215334			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0324 BH1 Sample 9			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.99	6.8	14	69	-	-	-
Aluminium	0.148	0.0476	0.295	0.616	-	-	-
Calcium	1.1	<0.012	2.19	1.54	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	0	<0.00001	0.000113	<0.0001	-	-	-
Sodium	1.51	0.123	3.02	3.17	-	-	-
Zirconium	<0.002	<0.002	<0.00399	<0.02	-	-	-
Magnesium	0.165	<0.036	0.33	<0.36	-	-	-
Tungsten	0.0321	0.0149	0.0642	0.173	-	-	-
Potassium	5.63	2.94	11.2	33.2	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.064	<0.019	0.128	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.109	0.0383	0.217	0.482	-	-	-
Cobalt	<0.00006	0.000069	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	-	-	-	-
Lithium	0.0223	0.00839	0.0445	0.103	-	-	-
Manganese	0.000827	0.0005	0.00165	0.00546	-	-	-
Phosphorus	0.0257	0.00938	0.0513	0.117	-	-	-
Strontium	0.00937	0.000278	0.0187	0.0155	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.886	8.056
Conductivity (µS/cm)	39.00	9.56
Temperature (°C)	20.80	18.40
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.245	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.301
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215334			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0324 BH1 Sample 9			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	<0.00036	<0.00036	<0.000719	<0.0036	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00288	<0.0015	0.00576	<0.015	-	-	-
Vanadium	0.00074	0.000279	0.00148	0.00343	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.886	8.056
Conductivity (µS/cm)	39.00	9.56
Temperature (°C)	20.80	18.40
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.245	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.392
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

Case	
SDG	130411-9
Lab Sample Number(s)	7215336
Sampled Date	08-Apr-2013
Customer Sample Ref.	SGS 383: 0325 BH1 Sample 10
Depth (m)	0.00

Solid Waste Analysis		**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.0206	0.0153	0.0411	0.159	0.5	2	25
Barium	0.000558	<0.00003	0.00112	0.000717	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	<0.00022	0.000551	<0.00044	0.0048	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00333	0.00167	0.00666	0.0188	0.5	10	30
Nickel	0.000219	0.000295	0.000438	0.00285	0.4	10	40
Lead	0.000161	0.0425	0.000322	0.37	0.5	10	50
Antimony	0.000851	0.000675	0.0017	0.00698	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	0.00105	0.0039	0.0021	0.0353	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	2.74	1.19	5.48	13.9	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	39.6	11.2	79.1	148	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.816	7.914
Conductivity (µS/cm)	30.10	9.07
Temperature (°C)	21.40	18.00
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.225	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
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24/04/2013 09:03:16

09:01:52 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.392
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215336			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0325 BH1 Sample 10			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	7.02	6.8	14	68	-	-	-
Aluminium	0.321	0.0836	0.641	1.14	-	-	-
Calcium	0.056	0.286	0.112	2.56	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	<0.00001	0.0000345	<0.00002	0.0003	-	-	-
Sodium	2.09	0.29	4.17	5.21	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.0818	<0.036	0.163	<0.36	-	-	-
Tungsten	0.0115	0.00913	0.023	0.0943	-	-	-
Potassium	5.68	3.08	11.4	34.1	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0599	<0.019	0.12	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.231	0.0793	0.461	0.988	-	-	-
Cobalt	0.000161	<0.00006	0.000322	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0453	0.0152	0.0904	0.19	-	-	-
Manganese	0.00175	0.000309	0.0035	0.00494	-	-	-
Phosphorus	0.0156	0.0141	0.0312	0.143	-	-	-
Strontium	0.00357	0.00103	0.00713	0.0136	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.816	7.914
Conductivity (µS/cm)	30.10	9.07
Temperature (°C)	21.40	18.00
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.225	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
24/04/2013 09:03:16

09:01:52 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.392
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-9			
Lab Sample Number(s)	7215336			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0325 BH1 Sample 10			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	<0.00036	<0.00036	<0.000719	<0.0036	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00319	<0.0015	0.00638	<0.015	-	-	-
Vanadium	0.000402	0.000261	0.000803	0.00279	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.816	7.914
Conductivity (µS/cm)	30.10	9.07
Temperature (°C)	21.40	18.00
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.225	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
24/04/2013 09:03:16

09:01:52 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM114		Leaching Procedure for CEN Two Stage BatchTest 2:1/8:1 Cumulative		
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM224	US EPA Method 6010B	Determination of Alkaline Metals by iCap 6500 Duo ICP-OES		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM250		Determination of Silver in Soil by ICP-OES		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM283		Determination of Dissolved Niobium, Tungsten, and Zirconium in Water Matrices by ICP-MS		
TM307		Ultra Low Metals		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	7215324	7215325	7215327	7215328	7215329	7215331	7215332	7215333	7215334	7215336
Customer Sample Ref.	SGS 383: 0316 B H1 Sample 1	SGS 383: 0317 B H1 Sample 2	SGS 383: 0318 B H1 Sample 3	SGS 383: 0319 B H1 Sample 4	SGS 383: 0320 B H1 Sample 5	SGS 383: 0321 B H1 Sample 6	SGS 383: 0322 B H1 Sample 7	SGS 383: 0323 B H1 Sample 8	SGS 383: 0324 B H1 Sample 9	SGS 383: 0325 B H1 Sample 10
AGS Ref.										
Depth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Alkali Metals by iCap-OES (Soil)	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	19-Apr-2013	23-Apr-2013
Anions by Kone (w)	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	18-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013
CEN 2:1 Leachate (2 Stage)	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013
CEN 2:1 Readings	17-Apr-2013	18-Apr-2013	17-Apr-2013	18-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	18-Apr-2013	17-Apr-2013
CEN 8:1 Leachate (2 Stage)	17-Apr-2013	18-Apr-2013	17-Apr-2013	18-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	18-Apr-2013	17-Apr-2013
CEN 8:1 Readings	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013
Dissolved Metals by ICP-MS	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	19-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013
Dissolved W, Nb and Zr by ICP-MS	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013
Fluoride	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013
Mercury Dissolved	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013
Metals by iCap-OES Dissolved (W)	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013
Metals in solid samples by OES	24-Apr-2013	24-Apr-2013	24-Apr-2013	24-Apr-2013	24-Apr-2013	24-Apr-2013	24-Apr-2013	24-Apr-2013	19-Apr-2013	23-Apr-2013
Metals Ultra Low	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013
pH Value of Filtered Water	17-Apr-2013	17-Apr-2013	17-Apr-2013	18-Apr-2013	17-Apr-2013	17-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013
Sample description	11-Apr-2013	17-Apr-2013	11-Apr-2013	17-Apr-2013	11-Apr-2013	17-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	17-Apr-2013
Silver	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	19-Apr-2013	23-Apr-2013
Total Dissolved Solids	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	18-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013

SDG:	130411-9	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221669
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -
Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

ALcontrol Laboratories

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Coffey Geotechnics Limited
9/11 Hornbeam Square South
Hornbeam Park
Harrogate
North Yorkshire
HG2 8NB

Attention: Lesley MacCormack

CERTIFICATE OF ANALYSIS

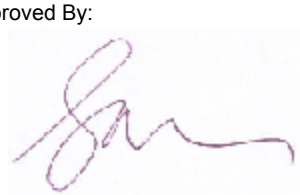
Date:	28 March 2013
Customer:	H_COFFEYGEO_HGT
Sample Delivery Group (SDG):	130318-8
Your Reference:	
Location:	Leachate Analysis
Report No:	217787

We received 10 samples on Friday March 15, 2013 and 10 of these samples were scheduled for analysis which was completed on Thursday March 28, 2013. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
7087647	BH2 SAMPLE 1			14/03/2013
7087648	BH2 SAMPLE 2			14/03/2013
7087649	BH2 SAMPLE 3			14/03/2013
7087652	BH2 SAMPLE 4			14/03/2013
7087654	BH2 SAMPLE 5			14/03/2013
7087655	BH2 SAMPLE 6			14/03/2013
7087657	BH2 SAMPLE 7			14/03/2013
7087658	BH2 SAMPLE 8			14/03/2013
7087660	BH2 SAMPLE 9			14/03/2013
7087661	BH2 SAMPLE 10			14/03/2013

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

SOLID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			7087647	BH2 SAMPLE 1			BAG
			7087648	BH2 SAMPLE 2			Kone Cup
			7087649	BH2 SAMPLE 3			BAG
			7087652	BH2 SAMPLE 4			BAG
			7087654	BH2 SAMPLE 5			BAG
			7087655	BH2 SAMPLE 6			BAG
			7087657	BH2 SAMPLE 7			BAG
			7087658	BH2 SAMPLE 8			BAG
			7087660	BH2 SAMPLE 9			BAG
			7087661	BH2 SAMPLE 10			BAG
Alkali Metals by iCap-OES (Soil)	All	NDPs: 0 Tests: 10	X	X	X	X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 10	X	X	X	X	X
CEN 2:1 Readings	All	NDPs: 0 Tests: 10	X	X	X	X	X
CEN 8:1 Readings	All	NDPs: 0 Tests: 10	X	X	X	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 10	X	X	X	X	X
Dissolved W, Nb and Zr by ICP-MS	All	NDPs: 0 Tests: 10	X	X	X	X	X
Fluoride	All	NDPs: 0 Tests: 10	X	X	X	X	X
Mercury Dissolved	All	NDPs: 0 Tests: 10	X	X	X	X	X
Metals by iCap-OES	All	NDPs: 0 Tests: 10	X	X	X	X	X
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 10	X	X	X	X	X
pH Value	All	NDPs: 0 Tests: 1		X			
pH Value of Filtered Water	All	NDPs: 0 Tests: 10	X	X	X	X	X
Sample description	All	NDPs: 0 Tests: 10	X	X	X	X	X
Silver	All	NDPs: 0 Tests: 10	X	X	X	X	X
Total Dissolved Solids	All	NDPs: 0 Tests: 10	X	X	X	X	X

CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
7087647	BH2 SAMPLE 1		Light Brown	N/A	0.1 - 2 mm	N/A	N/A
7087648	BH2 SAMPLE 2		Light Brown	N/A	0.063 - 0.1 mm	N/A	N/A
7087649	BH2 SAMPLE 3		Light Brown	N/A	0.1 - 2 mm	N/A	N/A
7087652	BH2 SAMPLE 4		Light Brown	N/A	0.1 - 2 mm	N/A	N/A
7087654	BH2 SAMPLE 5		Light Brown	N/A	0.1 - 2 mm	N/A	N/A
7087655	BH2 SAMPLE 6		Light Brown	N/A	0.1 - 2 mm	N/A	N/A
7087657	BH2 SAMPLE 7		Light Brown	N/A	0.1 - 2 mm	N/A	N/A
7087658	BH2 SAMPLE 8		Light Brown	N/A	0.1 - 2 mm	N/A	N/A
7087660	BH2 SAMPLE 9		Cream	N/A	0.1 - 2 mm	N/A	N/A
7087661	BH2 SAMPLE 10		Light Brown	N/A	0.1 - 2 mm	N/A	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH2 SAMPLE 1	BH2 SAMPLE 2	BH2 SAMPLE 3	BH2 SAMPLE 4	BH2 SAMPLE 5	BH2 SAMPLE 6
			Depth (m)	.	.	.	.	.	.
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	14/03/2013	14/03/2013	14/03/2013	14/03/2013	14/03/2013	14/03/2013
			Sample Time	.	.	.	.	.	.
			Date Received	15/03/2013	15/03/2013	15/03/2013	15/03/2013	15/03/2013	15/03/2013
			SDG Ref	130318-8	130318-8	130318-8	130318-8	130318-8	130318-8
			Lab Sample No.(s)	7087647	7087648	7087649	7087652	7087654	7087655
			AGS Reference						
Aluminium	<11 mg/kg	TM181		3160	3060	5720	2650	8300	5060
Antimony	<0.6 mg/kg	TM181		6.81	25.6	14.9	6.65	10.4	4.29
Arsenic	<0.6 mg/kg	TM181		335	636	429	282	492	442
Barium	<0.6 mg/kg	TM181		150	20.3	71.3	30.3	87.5	22.5
Beryllium	<0.01 mg/kg	TM181		1.43	1.85	1.69	1.33	2.33	1.95
Boron	<0.7 mg/kg	TM181		11.1	5.36	5.32	13.9	7.16	3.41
Cadmium	<0.02 mg/kg	TM181		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Chromium	<0.9 mg/kg	TM181		15	11.2	27	11.4	24	25.8
Cobalt	<0.1 mg/kg	TM181		0.813	0.558	2.02	1.16	2.76	0.832
Copper	<1.4 mg/kg	TM181		118	215	102	87.3	221	138
Iron	<1000 mg/kg	TM181		15500	24500	26500	15000	30900	22900
Lead	<0.7 mg/kg	TM181		2.69	5.26	2.32	1.37	3.39	1.9
Manganese	<0.13 mg/kg	TM181		16.8	8.19	59.4	11.5	72.7	10.8
Mercury	<0.14 mg/kg	TM181		<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Molybdenum	<0.1 mg/kg	TM181		1.11	1.51	0.523	0.712	1.49	0.791
Nickel	<0.2 mg/kg	TM181		4.56	5.31	7.79	5.14	10.9	3.84
Phosphorus	<1 mg/kg	TM181		357	260	392	242	484	364
Selenium	<1 mg/kg	TM181		2.84	7.87	5.5	4.36	6.83	2.33
Strontium	<0.4 mg/kg	TM181		14.9	3.07	15.5	7.85	16.5	6.53
Tin	<0.24 mg/kg	TM181		12.7	6.32	16.8	20.9	23.5	3.57
Thallium	<0.7 mg/kg	TM181		<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Titanium	<0.1 mg/kg	TM181		140	53.6	496	220	742	189
Vanadium	<0.2 mg/kg	TM181		15.1	22.6	26.1	12.5	28.7	31.5
Zinc	<1.9 mg/kg	TM181		7.53	12.3	13.2	5.72	20.8	7.59
Calcium	<21 mg/kg	TM224		97.5	53.9	54.4	53.3	68.2	30.9
Sodium	<7 mg/kg	TM224		18.7	9.92	16.9	14.7	21.7	11.5
Magnesium	<8 mg/kg	TM224		228	98.4	785	180	1230	115
Potassium	<16 mg/kg	TM224		1440	1230	2910	1200	3820	1260
Silver	<10 mg/kg	TM250		<10	<10	<10	<10	<10	<10

CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH2 SAMPLE 7	BH2 SAMPLE 8	BH2 SAMPLE 9	BH2 SAMPLE 10		
			Depth (m)	.	.	.	.		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	14/03/2013	14/03/2013	14/03/2013	14/03/2013		
			Sample Time	.	.	.	.		
			Date Received	15/03/2013	15/03/2013	15/03/2013	15/03/2013		
			SDG Ref	130318-8	130318-8	130318-8	130318-8		
			Lab Sample No.(s)	7087657	7087658	7087660	7087661		
			AGS Reference						
Aluminium	<11 mg/kg	TM181		3380	3750	4280	7120		
Antimony	<0.6 mg/kg	TM181		10.3	7.23	3.16	10.5		
Arsenic	<0.6 mg/kg	TM181		313	601	341	397		
Barium	<0.6 mg/kg	TM181		44.1	20.3	25.8	55.9		
Beryllium	<0.01 mg/kg	TM181		2.53	2	0.954	1.7		
Boron	<0.7 mg/kg	TM181		8.29	2.1	1.34	7.94		
Cadmium	<0.02 mg/kg	TM181		<0.02	<0.02	<0.02	<0.02		
Chromium	<0.9 mg/kg	TM181		8.73	34.8	15	21		
Cobalt	<0.1 mg/kg	TM181		1.27	0.937	0.599	1.5		
Copper	<1.4 mg/kg	TM181		184	111	67.4	96		
Iron	<1000 mg/kg	TM181		24500	38400	10800	15200		
Lead	<0.7 mg/kg	TM181		2.35	1	1.55	2.43		
Manganese	<0.13 mg/kg	TM181		25.2	11.7	9.75	43.9		
Mercury	<0.14 mg/kg	TM181		<0.14	<0.14	<0.14	<0.14		
Molybdenum	<0.1 mg/kg	TM181		1.16	2.89	1.51	1.6		
Nickel	<0.2 mg/kg	TM181		10.6	4.05	2.31	4.34		
Phosphorus	<1 mg/kg	TM181		427	383	160	242		
Selenium	<1 mg/kg	TM181		9.46	2.57	<1	1.84		
Strontium	<0.4 mg/kg	TM181		10.1	2.39	7.4	11.7		
Tin	<0.24 mg/kg	TM181		10.3	7.9	2.35	11.7		
Thallium	<0.7 mg/kg	TM181		<0.7	<0.7	<0.7	<0.7		
Titanium	<0.1 mg/kg	TM181		258	382	129	297		
Vanadium	<0.2 mg/kg	TM181		10.1	40.8	29.4	32		
Zinc	<1.9 mg/kg	TM181		18.6	9.36	5.97	13.7		
Calcium	<21 mg/kg	TM224		50.8	44.9	51	47.9		
Sodium	<7 mg/kg	TM224		10.9	13	12.8	12		
Magnesium	<8 mg/kg	TM224		383	211	47.9	630		
Potassium	<16 mg/kg	TM224		1620	1240	774	2190		
Silver	<10 mg/kg	TM250		<10	<10	<10	<10		

CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.452
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130318-8			
Lab Sample Number(s)	7087648			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 2			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	-	0.00461	-	0.0462	0.5	2	25
Barium	0.000965	0.00131	0.00193	0.0125	20	100	300
Cadmium	-	<0.0001	-	<0.001	0.04	1	5
Chromium	<0.00022	<0.00022	<0.00044	<0.0022	0.5	10	70
Copper	-	<0.00085	-	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	-	0.000281	-	0.00514	0.5	10	30
Nickel	<0.00015	<0.00015	<0.0003	<0.0015	0.4	10	40
Lead	-	0.0114	-	0.0947	0.5	10	50
Antimony	-	0.000433	-	0.0133	0.06	0.7	5
Selenium	0.000859	<0.00039	0.00172	<0.0039	0.1	0.5	7
Zinc	-	0.00755	-	0.0655	4	50	200
Chloride	2.4	<2	4.8	<20	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	16.2	<5	32.4	<50	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	19-Mar-2013	22-Mar-2013
pH (pH Units)	6.061	7.041
Conductivity (µS/cm)	19.54	3.46
Temperature (°C)	19.90	19.80
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.300	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.452
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130318-8			
Lab Sample Number(s)	7087648			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 2			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.72	7.3	13	72	-	-	-
Aluminium	0.00805	0.0225	0.0161	0.2	-	-	-
Calcium	-	0.25	-	3.08	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	1.08	<0.076	2.15	1.85	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.102	<0.036	0.204	<0.36	-	-	-
Tungsten	0.00259	0.00259	0.00517	0.0259	-	-	-
Potassium	<2.34	<2.34	<4.68	<23.4	-	-	-
Beryllium	-	<0.00007	-	<0.0007	-	-	-
Iron	-	<0.019	-	<0.19	-	-	-
Silver	-	<0.0015	-	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0921	0.0249	0.184	0.364	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0103	0.00238	0.0205	0.0373	-	-	-
Manganese	-	0.000905	-	0.00894	-	-	-
Phosphorus	-	0.0151	-	0.136	-	-	-
Strontium	-	0.000488	-	0.00903	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	-	<0.00036	-	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	19-Mar-2013	22-Mar-2013
pH (pH Units)	6.061	7.041
Conductivity (µS/cm)	19.54	3.46
Temperature (°C)	19.90	19.80
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.300	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.452
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130318-8			
Lab Sample Number(s)	7087648			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 2			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	<0.00024	0.000332	<0.00048	0.00275	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	19-Mar-2013	22-Mar-2013
pH (pH Units)	6.061	7.041
Conductivity (µS/cm)	19.54	3.46
Temperature (°C)	19.90	19.80
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.300	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.472
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.5
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130318-8			
Lab Sample Number(s)	7087649			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 3			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.003	0.00733	0.00599	0.0662	0.5	2	25
Barium	-	0.00148	-	0.0174	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	-	<0.00022	-	<0.0022	0.5	10	70
Copper	0.00171	<0.00085	0.00341	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	-	<0.00024	-	<0.0024	0.5	10	30
Nickel	<0.00015	<0.00015	<0.0003	<0.0015	0.4	10	40
Lead	-	<0.00002	-	0.00079	0.5	10	50
Antimony	-	<0.00016	-	<0.0016	0.06	0.7	5
Selenium	-	<0.00039	-	<0.0039	0.1	0.5	7
Zinc	0.00907	<0.00041	0.0181	0.0148	4	50	200
Chloride	7.4	<2	14.8	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	17.2	21.7	34.5	210	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	19-Mar-2013	22-Mar-2013
pH (pH Units)	6.441	7.270
Conductivity (µS/cm)	20.30	4.03
Temperature (°C)	19.90	19.90
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.285	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.472
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.5
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130318-8			
Lab Sample Number(s)	7087649			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 3			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.99	8.1	14	79	-	-	-
Aluminium	0.00318	0.028	0.00636	0.239	-	-	-
Calcium	-	5.35	-	46.1	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	1.28	<0.076	2.56	2.08	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.143	<0.036	0.286	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	<2.34	<2.34	<4.68	<23.4	-	-	-
Beryllium	-	<0.00007	-	<0.0007	-	-	-
Iron	-	<0.019	-	<0.19	-	-	-
Silver	-	<0.0015	-	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0487	0.00987	0.0973	0.162	-	-	-
Cobalt	0.000082	<0.00006	0.000164	<0.0006	-	-	-
Sulphate (soluble) as S	4.7	<1	9.4	<10	-	-	-
Lithium	0.0149	0.00266	0.0298	0.0466	-	-	-
Manganese	-	0.000133	-	0.00518	-	-	-
Phosphorus	-	0.0184	-	0.188	-	-	-
Strontium	-	0.00551	-	0.0534	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	-	<0.00036	-	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	19-Mar-2013	22-Mar-2013
pH (pH Units)	6.441	7.270
Conductivity (µS/cm)	20.30	4.03
Temperature (°C)	19.90	19.90
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.285	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.472
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.5
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130318-8			
Lab Sample Number(s)	7087649			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 3			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	0.000268	0.000381	0.000536	0.00363	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	19-Mar-2013	22-Mar-2013
pH (pH Units)	6.441	7.270
Conductivity (µS/cm)	20.30	4.03
Temperature (°C)	19.90	19.90
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.285	

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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.422
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130318-8			
Lab Sample Number(s)	7087652			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 4			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	-	0.00156	-	0.0162	0.5	2	25
Barium	0.00366	0.00165	0.00731	0.0197	20	100	300
Cadmium	-	<0.0001	-	<0.001	0.04	1	5
Chromium	<0.00022	<0.00022	<0.00044	<0.0022	0.5	10	70
Copper	-	<0.00085	-	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	-	0.000303	-	0.00255	0.5	10	30
Nickel	<0.00015	<0.00015	<0.0003	<0.0015	0.4	10	40
Lead	-	0.000657	-	0.00582	0.5	10	50
Antimony	<0.00016	0.000643	<0.00032	0.00542	0.06	0.7	5
Selenium	-	<0.00039	-	<0.0039	0.1	0.5	7
Zinc	0.00351	0.00976	0.00702	0.0878	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	30.6	5.58	61.2	95.1	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	21-Mar-2013
pH (pH Units)	7.790	6.572
Conductivity (µS/cm)	34.00	4.52
Temperature (°C)	19.20	20.10
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.275	

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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.422
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130318-8			
Lab Sample Number(s)	7087652			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 4			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.63	7.1	13	70	-	-	-
Aluminium	0.0123	0.00846	0.0245	0.0906	-	-	-
Calcium	-	0.73	-	10.4	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	0.285	<0.076	0.569	<0.76	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.245	<0.036	0.489	0.385	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	2.57	<2.34	5.14	<23.4	-	-	-
Beryllium	-	<0.00007	-	<0.0007	-	-	-
Iron	-	<0.019	-	<0.19	-	-	-
Silver	-	<0.0015	-	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0973	0.0291	0.194	0.398	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	2.77	<1	5.53	<10	-	-	-
Lithium	0.00355	<0.00192	0.0071	<0.0192	-	-	-
Manganese	-	0.00251	-	0.0252	-	-	-
Phosphorus	-	<0.0063	-	<0.063	-	-	-
Strontium	-	0.00151	-	0.0283	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	-	<0.00036	-	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	21-Mar-2013
pH (pH Units)	7.790	6.572
Conductivity (µS/cm)	34.00	4.52
Temperature (°C)	19.20	20.10
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.275	

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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.422
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130318-8			
Lab Sample Number(s)	7087652			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 4			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	<0.00024	<0.00024	<0.00048	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	21-Mar-2013
pH (pH Units)	7.790	6.572
Conductivity (µS/cm)	34.00	4.52
Temperature (°C)	19.20	20.10
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.275	

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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.705
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.3
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130318-8			
Lab Sample Number(s)	7087654			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 5			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	-	0.00564	-	0.0506	0.5	2	25
Barium	0.00139	0.00335	0.00279	0.0303	20	100	300
Cadmium	-	<0.0001	-	<0.001	0.04	1	5
Chromium	<0.00022	<0.00022	<0.00044	<0.0022	0.5	10	70
Copper	-	<0.00085	-	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	-	<0.00024	-	<0.0024	0.5	10	30
Nickel	<0.00015	<0.00015	<0.0003	<0.0015	0.4	10	40
Lead	-	0.0112	-	0.0944	0.5	10	50
Antimony	-	0.00035	-	0.00399	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000781	<0.0039	0.1	0.5	7
Zinc	-	0.0192	-	0.184	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	13.9	27.6	27.8	254	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	19-Mar-2013	22-Mar-2013
pH (pH Units)	7.316	7.001
Conductivity (µS/cm)	15.23	3.65
Temperature (°C)	20.10	20.00
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.280	

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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.705
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.3
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130318-8			
Lab Sample Number(s)	7087654			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 5			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.59	8.2	13	79	-	-	-
Aluminium	0.00469	0.0455	0.00938	0.389	-	-	-
Calcium	-	7.3	-	61.9	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	1.01	<0.076	2.02	1.62	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.0893	<0.036	0.179	<0.36	-	-	-
Tungsten	0.00298	<0.0015	0.00596	<0.015	-	-	-
Potassium	<2.34	<2.34	<4.68	<23.4	-	-	-
Beryllium	-	<0.00007	-	<0.0007	-	-	-
Iron	-	<0.019	-	<0.19	-	-	-
Silver	-	<0.0015	-	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0262	0.0105	0.0525	0.13	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0126	0.00279	0.0252	0.0436	-	-	-
Manganese	-	0.00059	-	0.01	-	-	-
Phosphorus	-	0.00836	-	0.0987	-	-	-
Strontium	-	0.00341	-	0.0346	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	-	<0.00036	-	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	19-Mar-2013	22-Mar-2013
pH (pH Units)	7.316	7.001
Conductivity (µS/cm)	15.23	3.65
Temperature (°C)	20.10	20.00
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.280	

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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.705
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.3
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130318-8			
Lab Sample Number(s)	7087654			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 5			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	<0.00024	0.000507	<0.00048	0.00426	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	19-Mar-2013	22-Mar-2013
pH (pH Units)	7.316	7.001
Conductivity (µS/cm)	15.23	3.65
Temperature (°C)	20.10	20.00
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.280	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.98
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130318-8			
Lab Sample Number(s)	7087655			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 6			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	-	0.00131	-	0.0137	0.5	2	25
Barium	0.00431	0.000783	0.00862	0.0133	20	100	300
Cadmium	-	<0.0001	-	<0.001	0.04	1	5
Chromium	<0.00022	<0.00022	<0.00044	<0.0022	0.5	10	70
Copper	-	0.00638	-	0.0585	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	-	<0.00024	-	<0.0024	0.5	10	30
Nickel	0.000288	<0.00015	0.000576	<0.0015	0.4	10	40
Lead	-	<0.00002	-	0.00862	0.5	10	50
Antimony	-	0.000361	-	0.00305	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	-	0.00807	-	0.0968	4	50	200
Chloride	2.1	<2	4.2	<20	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	28.4	8.15	56.8	113	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	21-Mar-2013
pH (pH Units)	6.650	6.758
Conductivity (µS/cm)	31.80	5.52
Temperature (°C)	19.50	19.90
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.270	

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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.98
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130318-8			
Lab Sample Number(s)	7087655			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 6			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.9	7.1	14	71	-	-	-
Aluminium	0.0597	0.0114	0.119	0.188	-	-	-
Calcium	-	1.28	-	15.3	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	0.415	<0.076	0.829	<0.76	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.257	0.0574	0.514	0.882	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	<2.34	<2.34	<4.68	<23.4	-	-	-
Beryllium	-	<0.00007	-	<0.0007	-	-	-
Iron	-	<0.019	-	<0.19	-	-	-
Silver	-	<0.0015	-	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.014	<0.0094	0.0279	<0.094	-	-	-
Cobalt	0.00158	<0.00006	0.00315	0.00244	-	-	-
Sulphate (soluble) as S	1.27	<1	2.53	<10	-	-	-
Lithium	0.00694	<0.00192	0.0139	<0.0192	-	-	-
Manganese	-	0.00712	-	0.0721	-	-	-
Phosphorus	-	0.00725	-	0.0968	-	-	-
Strontium	-	0.00486	-	0.057	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	-	<0.00036	-	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	21-Mar-2013
pH (pH Units)	6.650	6.758
Conductivity (µS/cm)	31.80	5.52
Temperature (°C)	19.50	19.90
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.270	

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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.98
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130318-8			
Lab Sample Number(s)	7087655			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 6			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	<0.00024	0.000594	<0.00048	0.00502	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	21-Mar-2013
pH (pH Units)	6.650	6.758
Conductivity (µS/cm)	31.80	5.52
Temperature (°C)	19.50	19.90
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.270	

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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.341
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130318-8			
Lab Sample Number(s)	7087657			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 7			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.00251	0.00426	0.00501	0.0399	0.5	2	25
Barium	-	0.00499	-	0.0492	20	100	300
Cadmium	-	<0.0001	-	<0.001	0.04	1	5
Chromium	<0.00022	<0.00022	<0.00044	<0.0022	0.5	10	70
Copper	-	<0.00085	-	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	-	0.000741	-	0.00627	0.5	10	30
Nickel	<0.00015	0.00016	<0.0003	<0.0015	0.4	10	40
Lead	-	0.000792	-	0.00763	0.5	10	50
Antimony	<0.00016	0.000318	<0.00032	0.00269	0.06	0.7	5
Selenium	-	<0.00039	-	<0.0039	0.1	0.5	7
Zinc	0.00798	0.0165	0.0159	0.152	4	50	200
Chloride	<2	2.1	<4	<20	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	32.9	43.2	65.7	416	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	21-Mar-2013
pH (pH Units)	7.393	6.697
Conductivity (µS/cm)	32.60	23.50
Temperature (°C)	19.30	20.00
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.270	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.341
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130318-8			
Lab Sample Number(s)	7087657			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 7			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	7.21	7.6	14	75	-	-	-
Aluminium	0.00575	0.00964	0.0115	0.0903	-	-	-
Calcium	-	8.36	-	78.2	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	<0.076	2.21	<0.152	18.7	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.116	<0.036	0.232	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	2.78	<2.34	5.55	<23.4	-	-	-
Beryllium	-	<0.00007	-	<0.0007	-	-	-
Iron	-	<0.019	-	<0.19	-	-	-
Silver	-	<0.0015	-	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0899	0.0247	0.18	0.348	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	2.33	<2	19.7	-	-	-
Lithium	0.0132	0.00339	0.0263	0.049	-	-	-
Manganese	-	0.000551	-	0.00613	-	-	-
Phosphorus	-	<0.0063	-	<0.063	-	-	-
Strontium	-	0.00736	-	0.072	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	-	<0.00036	-	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	21-Mar-2013
pH (pH Units)	7.393	6.697
Conductivity (µS/cm)	32.60	23.50
Temperature (°C)	19.30	20.00
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.270	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.341
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130318-8			
Lab Sample Number(s)	7087657			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 7			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	<0.00024	0.000263	<0.000479	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	21-Mar-2013
pH (pH Units)	7.393	6.697
Conductivity (µS/cm)	32.60	23.50
Temperature (°C)	19.30	20.00
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.270	

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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	1.62
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98.4
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130318-8			
Lab Sample Number(s)	7087658			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 8			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	-	0.00245	-	0.0243	0.5	2	25
Barium	0.00303	0.0015	0.00607	0.0174	20	100	300
Cadmium	-	<0.0001	-	<0.001	0.04	1	5
Chromium	0.000261	<0.00022	0.000522	<0.0022	0.5	10	70
Copper	-	<0.00085	-	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	-	0.000289	-	0.00244	0.5	10	30
Nickel	<0.00015	<0.00015	<0.0003	<0.0015	0.4	10	40
Lead	-	<0.00002	-	0.0025	0.5	10	50
Antimony	-	<0.00016	-	<0.0016	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.00078	<0.0039	0.1	0.5	7
Zinc	-	0.000436	-	0.0114	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	32.8	12.5	65.6	156	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	21-Mar-2013
pH (pH Units)	7.689	7.283
Conductivity (µS/cm)	19.79	12.65
Temperature (°C)	19.30	20.00
Volume Leachant (Litres)	0.347	1.400
Volume of Eluate VE1 (Litres)	0.275	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	1.62
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98.4
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130318-8			
Lab Sample Number(s)	7087658			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 8			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.83	6.8	14	68	-	-	-
Aluminium	0.0151	0.0111	0.0302	0.117	-	-	-
Calcium	-	1.44	-	14.8	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	0.0852	0.65	0.17	5.61	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.131	0.0415	0.262	0.556	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	<2.34	<2.34	<4.68	<23.4	-	-	-
Beryllium	-	<0.00007	-	<0.0007	-	-	-
Iron	-	<0.019	-	<0.19	-	-	-
Silver	-	<0.0015	-	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0106	<0.0094	0.0212	<0.094	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.00406	<0.00192	0.00811	<0.0192	-	-	-
Manganese	-	0.00796	-	0.0692	-	-	-
Phosphorus	-	<0.0063	-	<0.063	-	-	-
Strontium	-	0.00176	-	0.0216	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	-	<0.00036	-	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	21-Mar-2013
pH (pH Units)	7.689	7.283
Conductivity (µS/cm)	19.79	12.65
Temperature (°C)	19.30	20.00
Volume Leachant (Litres)	0.347	1.400
Volume of Eluate VE1 (Litres)	0.275	

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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	1.62
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98.4
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130318-8			
Lab Sample Number(s)	7087658			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 8			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	0.000643	<0.00024	0.00129	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	21-Mar-2013
pH (pH Units)	7.689	7.283
Conductivity (µS/cm)	19.79	12.65
Temperature (°C)	19.30	20.00
Volume Leachant (Litres)	0.347	1.400
Volume of Eluate VE1 (Litres)	0.275	

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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.0901
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130318-8			
Lab Sample Number(s)	7087660			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 9			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.00238	0.00202	0.00475	0.0208	0.5	2	25
Barium	-	0.00207	-	0.0226	20	100	300
Cadmium	-	<0.0001	-	<0.001	0.04	1	5
Chromium	0.000281	<0.00022	0.000562	<0.0022	0.5	10	70
Copper	-	0.00113	-	0.0119	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	-	0.000361	-	0.00415	0.5	10	30
Nickel	0.000412	<0.00015	0.000824	<0.0015	0.4	10	40
Lead	-	<0.00002	-	0.00109	0.5	10	50
Antimony	<0.00016	0.000235	<0.00032	0.00198	0.06	0.7	5
Selenium	-	<0.00039	-	<0.0039	0.1	0.5	7
Zinc	0.00747	0.00147	0.0149	0.0241	4	50	200
Chloride	10.8	<2	21.6	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	49	15.1	98	205	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	20-Mar-2013
pH (pH Units)	7.547	6.882
Conductivity (µS/cm)	56.70	1,480.00
Temperature (°C)	20.20	20.10
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.275	

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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.0901
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130318-8			
Lab Sample Number(s)	7087660			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 9			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.53	6.7	13	67	-	-	-
Aluminium	0.00607	0.00669	0.0121	0.0659	-	-	-
Calcium	-	1.58	-	19.8	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	2.78	0.967	5.57	12.5	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.273	0.106	0.546	1.32	-	-	-
Tungsten	0.0019	<0.0015	0.0038	<0.015	-	-	-
Potassium	3.59	<2.34	7.19	<23.4	-	-	-
Beryllium	-	<0.00007	-	<0.0007	-	-	-
Iron	-	0.0219	-	<0.19	-	-	-
Silver	-	<0.0015	-	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.014	<0.0094	0.0281	<0.094	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	1.83	1.23	3.67	13.3	-	-	-
Lithium	0.00501	<0.00192	0.01	<0.0192	-	-	-
Manganese	-	0.0131	-	0.115	-	-	-
Phosphorus	-	0.0802	-	0.695	-	-	-
Strontium	-	0.0056	-	0.0648	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	-	<0.00036	-	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	20-Mar-2013
pH (pH Units)	7.547	6.882
Conductivity (µS/cm)	56.70	1,480.00
Temperature (°C)	20.20	20.10
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.275	

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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.0901
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130318-8			
Lab Sample Number(s)	7087660			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 9			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	0.000317	0.000318	0.000634	0.00318	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	20-Mar-2013
pH (pH Units)	7.547	6.882
Conductivity (µS/cm)	56.70	1,480.00
Temperature (°C)	20.20	20.10
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.275	

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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.695
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.3
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130318-8			
Lab Sample Number(s)	7087661			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 10			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	-	0.00252	-	0.0251	0.5	2	25
Barium	0.00438	0.000613	0.00877	0.0119	20	100	300
Cadmium	-	<0.0001	-	<0.001	0.04	1	5
Chromium	<0.00022	<0.00022	<0.00044	<0.0022	0.5	10	70
Copper	-	<0.00085	-	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	-	<0.00024	-	<0.0024	0.5	10	30
Nickel	<0.00015	<0.00015	<0.0003	<0.0015	0.4	10	40
Lead	-	0.00003	-	0.00144	0.5	10	50
Antimony	-	0.000263	-	0.00222	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000781	<0.0039	0.1	0.5	7
Zinc	-	0.00128	-	0.032	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	28	8.49	56	115	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	21-Mar-2013
pH (pH Units)	7.959	7.376
Conductivity (µS/cm)	27.20	5.63
Temperature (°C)	19.20	19.90
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.270	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Mcerts Certification does not apply to leachates
28/03/2013 14:13:21

14:13:15 28/03/2013

CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.695
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.3
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130318-8			
Lab Sample Number(s)	7087661			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 10			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.93	6.9	14	69	-	-	-
Aluminium	0.0106	0.00612	0.0212	0.0681	-	-	-
Calcium	-	0.999	-	11.9	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	0.151	<0.076	0.302	<0.76	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.136	<0.036	0.271	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	2.92	<2.34	5.84	<23.4	-	-	-
Beryllium	-	<0.00007	-	<0.0007	-	-	-
Iron	-	<0.019	-	<0.19	-	-	-
Silver	-	<0.0015	-	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.097	0.0329	0.194	0.428	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.013	0.00424	0.026	0.0559	-	-	-
Manganese	-	0.000926	-	0.0103	-	-	-
Phosphorus	-	<0.0063	-	<0.063	-	-	-
Strontium	-	0.000961	-	0.0155	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	-	<0.00036	-	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	21-Mar-2013
pH (pH Units)	7.959	7.376
Conductivity (µS/cm)	27.20	5.63
Temperature (°C)	19.20	19.90
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.270	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
28/03/2013 14:13:21

14:13:15 28/03/2013

CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.695
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.3
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130318-8			
Lab Sample Number(s)	7087661			
Sampled Date	14-Mar-2013			
Customer Sample Ref.	BH2 SAMPLE 10			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	<0.00024	<0.00024	<0.00048	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	18-Mar-2013	21-Mar-2013
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CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM114		Leaching Procedure for CEN Two Stage BatchTest 2:1/8:1 Cumulative		
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM224	US EPA Method 6010B	Determination of Alkaline Metals by iCap 6500 Duo ICP-OES		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM250		Determination of Silver in Soil by ICP-OES		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM283		Determination of Dissolved Niobium, Tungsten, and Zirconium in Water Matrices by ICP-MS		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	7087647	7087648	7087649	7087652	7087654	7087655	7087657	7087658	7087660	7087661
Customer Sample Ref.	BH2 SAMPLE 1	BH2 SAMPLE 2	BH2 SAMPLE 3	BH2 SAMPLE 4	BH2 SAMPLE 5	BH2 SAMPLE 6	BH2 SAMPLE 7	BH2 SAMPLE 8	BH2 SAMPLE 9	BH2 SAMPLE 10
AGS Ref.										
Depth										
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Alkali Metals by iCap-OES (Soil)	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013
Anions by Kone (w)	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013
CEN 2:1 Leachate (2 Stage)	22-Mar-2013	21-Mar-2013	21-Mar-2013	22-Mar-2013	21-Mar-2013	22-Mar-2013	22-Mar-2013	22-Mar-2013	22-Mar-2013	22-Mar-2013
CEN 2:1 Readings	26-Mar-2013	27-Mar-2013	27-Mar-2013	26-Mar-2013	27-Mar-2013	26-Mar-2013	26-Mar-2013	26-Mar-2013	27-Mar-2013	26-Mar-2013
CEN 8:1 Leachate (2 Stage)	26-Mar-2013	27-Mar-2013	27-Mar-2013	26-Mar-2013	27-Mar-2013	26-Mar-2013	26-Mar-2013	26-Mar-2013	27-Mar-2013	26-Mar-2013
CEN 8:1 Readings	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013
Dissolved Metals by ICP-MS	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	28-Mar-2013	27-Mar-2013	28-Mar-2013	27-Mar-2013	28-Mar-2013
Dissolved W, Nb and Zr by ICP-MS	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013
Fluoride	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013
Mercury Dissolved	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013
Metals by iCap-OES Dissolved (W)	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013
Metals in solid samples by OES	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	28-Mar-2013	27-Mar-2013
pH Value	27-Mar-2013									
pH Value of Filtered Water	26-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013
Sample description	25-Mar-2013	25-Mar-2013	25-Mar-2013	25-Mar-2013	25-Mar-2013	25-Mar-2013	25-Mar-2013	25-Mar-2013	25-Mar-2013	25-Mar-2013
Silver	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013
Total Dissolved Solids	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013	27-Mar-2013

SDG:	130318-8	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	217787
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -
Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

ALcontrol Laboratories

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Website: www.alcontrol.com

Coffey Geotechnics Limited
9/11 Hornbeam Square South
Hornbeam Park
Harrogate
North Yorkshire
HG2 8NB

Attention: Lesley MacCormack

CERTIFICATE OF ANALYSIS

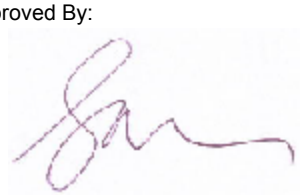
Date:	24 April 2013
Customer:	H_COFFEYGEO_HGT
Sample Delivery Group (SDG):	130402-19
Your Reference:	
Location:	Leachate Analysis
Report No:	221667

We received 10 samples on Tuesday April 02, 2013 and 10 of these samples were scheduled for analysis which was completed on Wednesday April 24, 2013. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
7166666	SGS 383:0256 BH3A Sample 1		3.90 - 4.25	
7166667	SGS 383:0257 BH3A Sample 2		10.10 - 10.45	
7166668	SGS 383:0258 BH3A Sample 3		14.00 - 14.35	
7166670	SGS 383:0259 BH3A Sample 4		21.35 - 21.75	
7166672	SGS 383:0260 BH3A Sample 5		26.30 - 26.70	
7166673	SGS 383:0261 BH3A Sample 6		30.45 - 30.90	
7166674	SGS 383:0262 BH3A Sample 7		35.15 - 35.50	
7166675	SGS 383:0263 BH3A Sample 8		38.70 - 38.95	
7166676	SGS 383:0264 BH3A Sample 9		43.15 - 43.60	
7166679	SGS 383:0265 BH3A Sample 10		47.20 - 47.60	

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

SOLID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			716666	SGS 383:0256 BH3A		3.90 - 4.25	BAG
			716667	SGS 383:0257 BH3A		10.10 - 10.45	BAG
			716668	SGS 383:0258 BH3A		14.00 - 14.35	BAG
			716670	SGS 383:0259 BH3A		21.35 - 21.75	BAG
			716672	SGS 383:0260 BH3A		26.30 - 26.70	BAG
			716673	SGS 383:0261 BH3A		30.45 - 30.90	BAG
			716674	SGS 383:0262 BH3A		35.15 - 35.50	BAG
			716675	SGS 383:0263 BH3A		38.70 - 38.95	BAG
			716676	SGS 383:0264 BH3A		43.15 - 43.60	BAG
			716679	SGS 383:0265 BH3A		47.20 - 47.60	BAG
Alkali Metals by iCap-OES (Soil)	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
CEN 2:1 Readings	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
CEN 8:1 Readings	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Dissolved W, Nb and Zr by ICP-MS	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Fluoride	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Mercury Dissolved	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Metals in solid samples by OES	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
pH Value of Filtered Water	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Sample description	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Silver	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Total Dissolved Solids	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X

CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
7166666	SGS 383:0256 BH3A Sample 1	3.90 - 4.25	Light Brown	Dry Sample Received	2 - 10 mm	Stones	None
7166667	SGS 383:0257 BH3A Sample 2	10.10 - 10.45	Light Brown	Dry Sample Received	0.1 - 2 mm	Stones	None
7166668	SGS 383:0258 BH3A Sample 3	14.00 - 14.35	Light Brown	Dry Sample Received	0.1 - 2 mm	Stones	None
7166670	SGS 383:0259 BH3A Sample 4	21.35 - 21.75	Light Brown	Dry Sample Received	2 - 10 mm	Stones	None
7166672	SGS 383:0260 BH3A Sample 5	26.30 - 26.70	Grey	Dry Sample Received	2 - 10 mm	Stones	None
7166673	SGS 383:0261 BH3A Sample 6	30.45 - 30.90	Light Brown	Dry Sample Received	2 - 10 mm	Stones	None
7166674	SGS 383:0262 BH3A Sample 7	35.15 - 35.50	Light Brown	Sand	2 - 10 mm	Stones	None
7166675	SGS 383:0263 BH3A Sample 8	38.70 - 38.95	Grey	Dry Sample Received	2 - 10 mm	Stones	None
7166676	SGS 383:0264 BH3A Sample 9	43.15 - 43.60	Light Brown	Dry Sample Received	2 - 10 mm	Stones	None
7166679	SGS 383:0265 BH3A Sample 10	47.20 - 47.60	Light Brown	Dry Sample Received	2 - 10 mm	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	SGS 383:0256 BH 3A Sample 1	SGS 383:0257 BH 3A Sample 2	SGS 383:0258 BH 3A Sample 3	SGS 383:0259 BH 3A Sample 4	SGS 383:0260 BH 3A Sample 5	SGS 383:0261 BH 3A Sample 6
			Depth (m)	3.90 - 4.25	10.10 - 10.45	14.00 - 14.35	21.35 - 21.75	26.30 - 26.70	30.45 - 30.90
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	-	-	-	-	-	-
			Sample Time	.	.	.	.	.	.
			Date Received	02/04/2013	02/04/2013	02/04/2013	02/04/2013	02/04/2013	02/04/2013
			SDG Ref	130402-19	130402-19	130402-19	130402-19	130402-19	130402-19
			Lab Sample No.(s)	7166666	7166667	7166668	7166670	7166672	7166673
			AGS Reference						
Aluminium	<11 mg/kg	TM181		6550 §	22400 §	14800 §	59700 §	42800 §	41400 §
Antimony	<0.6 mg/kg	TM181		6.93 § #	1.55 § #	<0.6 § #	<0.6 § #	<0.6 § #	1.13 § #
Arsenic	<0.6 mg/kg	TM181		263 § #	192 § #	85.3 § #	117 § #	80.4 § #	83.7 § #
Barium	<0.6 mg/kg	TM181		121 § #	141 § #	129 § #	653 § #	364 § #	361 § #
Beryllium	<0.01 mg/kg	TM181		1.83 § #	1.05 § #	0.839 § #	5.05 § #	3.8 § #	10.1 § #
Boron	<0.7 mg/kg	TM181		9.9 § #	2.48 § #	10.8 § #	8.13 § #	2.62 § #	3.25 § #
Cadmium	<0.02 mg/kg	TM181		<0.02 § #	<0.02 § #	<0.02 § #	<0.02 § #	0.0865 § #	0.646 § #
Chromium	<0.9 mg/kg	TM181		15.6 § #	50.8 § #	27.3 § #	81.8 § #	72.8 § #	62.9 § #
Cobalt	<0.1 mg/kg	TM181		2.41 § #	7.11 § #	4.37 § #	14 § #	51.7 § #	49.1 § #
Copper	<1.4 mg/kg	TM181		130 § #	205 § #	35.9 § #	158 § #	4.35 § #	548 § #
Iron	<1000 mg/kg	TM181		30300 § #	47800 § #	24700 § #	82200 § #	47500 § #	54200 § #
Lead	<0.7 mg/kg	TM181		4.72 § #	6.07 § #	4.14 § #	7.16 § #	5.92 § #	3.76 § #
Manganese	<0.13 mg/kg	TM181		62.7 § #	337 § #	220 § #	1320 § #	457 § #	662 § #
Mercury	<0.14 mg/kg	TM181		<0.14 § #	<0.14 § #	<0.14 § #	<0.14 § #	<0.14 § #	<0.14 § #
Molybdenum	<0.1 mg/kg	TM181		1.8 § #	2.07 § #	0.826 § #	<0.1 § #	0.627 § #	<0.1 § #
Nickel	<0.2 mg/kg	TM181		15.7 § #	26.7 § #	19.3 § #	54.4 § #	200 § #	177 § #
Phosphorus	<1 mg/kg	TM181		357 §	261 §	162 §	3260 §	3250 §	3080 §
Selenium	<1 mg/kg	TM181		5.48 § #	1.78 § #	<1 § #	<1 § #	<1 § #	<1 § #
Strontium	<0.4 mg/kg	TM181		28.5 § #	8.56 § #	14.5 § #	55 § #	167 § #	99.8 § #
Tin	<0.24 mg/kg	TM181		12.5 § #	18.9 § #	18.6 § #	20.2 § #	6.93 § #	23.2 § #
Thallium	<0.7 mg/kg	TM181		<0.7 § #	5.58 § #	<0.7 § #	4.83 § #	<0.7 § #	1.01 § #
Titanium	<0.1 mg/kg	TM181		450 §	2180 §	1260 §	2030 §	1730 §	1950 §
Vanadium	<0.2 mg/kg	TM181		24.1 § #	68 § #	34.8 § #	209 § #	146 § #	122 § #
Zinc	<1.9 mg/kg	TM181		16.5 § #	60.6 § #	22.9 § #	162 § #	207 § #	247 § #
Calcium	<21 mg/kg	TM224		159 §	59.6 §	396 §	8990 §	16600 §	14800 §
Sodium	<7 mg/kg	TM224		15.6 §	37.8 §	32.2 §	618 §	2600 §	1970 §
Magnesium	<8 mg/kg	TM224		1220 §	4640 §	4170 §	70700 §	28900 §	26100 §
Potassium	<16 mg/kg	TM224		3360 §	12600 §	8610 §	46100 §	15000 §	17100 §
Silver	<10 mg/kg	TM250		<10 §	<10 §	<10 §	<10 §	<10 §	<10 §

CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	SGS 383:0262 BH 3A Sample 7	SGS 383:0263 BH 3A Sample 8	SGS 383:0264 BH 3A Sample 9	SGS 383:0265 BH 3A Sample 10		
			Depth (m)	35.15 - 35.50	38.70 - 38.95	43.15 - 43.60	47.20 - 47.60		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	-	-	-	-		
			Sample Time	.	.	.	.		
			Date Received	02/04/2013	02/04/2013	02/04/2013	02/04/2013		
			SDG Ref	130402-19	130402-19	130402-19	130402-19		
			Lab Sample No.(s)	7166674	7166675	7166676	7166679		
			AGS Reference						
Aluminium	<11 mg/kg	TM181		43600 §	1870 §	29700 §	45200 §		
Antimony	<0.6 mg/kg	TM181		<0.6 § #	3.57 § #	2.77 § #	2.05 § #		
Arsenic	<0.6 mg/kg	TM181		158 § M	20.8 § #	53.9 § #	71.8 § #		
Barium	<0.6 mg/kg	TM181		265 § #	115 § #	276 § #	458 § #		
Beryllium	<0.01 mg/kg	TM181		3.49 § M	0.466 § #	1.59 § #	2.54 § #		
Boron	<0.7 mg/kg	TM181		4.14 § #	35.3 § #	2.26 § #	2.34 § #		
Cadmium	<0.02 mg/kg	TM181		<0.02 § M	0.0618 § #	0.362 § #	0.583 § #		
Chromium	<0.9 mg/kg	TM181		74.8 § M	13.8 § #	71 § #	99 § #		
Cobalt	<0.1 mg/kg	TM181		18.6 § M	3.22 § #	11.7 § #	13.1 § #		
Copper	<1.4 mg/kg	TM181		709 § M	24.9 § #	65 § #	57.5 § #		
Iron	<1000 mg/kg	TM181		67800 § #	8270 § #	45400 § #	56600 § #		
Lead	<0.7 mg/kg	TM181		5.49 § M	2.38 § #	5.31 § #	7.58 § #		
Manganese	<0.13 mg/kg	TM181		735 § M	55.8 § #	356 § #	586 § #		
Mercury	<0.14 mg/kg	TM181		<0.14 § M	<0.14 § #	<0.14 § #	<0.14 § #		
Molybdenum	<0.1 mg/kg	TM181		0.362 § #	0.277 § #	<0.1 § #	<0.1 § #		
Nickel	<0.2 mg/kg	TM181		114 § M	8.81 § #	36.6 § #	37.9 § #		
Phosphorus	<1 mg/kg	TM181		2940 §	164 §	233 §	356 §		
Selenium	<1 mg/kg	TM181		<1 § #	<1 § #	<1 § #	<1 § #		
Strontium	<0.4 mg/kg	TM181		53.8 § #	20.3 § #	44.5 § #	64 § #		
Tin	<0.24 mg/kg	TM181		32.9 § #	13.3 § #	22.4 § #	42.9 § #		
Thallium	<0.7 mg/kg	TM181		1.84 § #	<0.7 § #	1.87 § #	2.54 § #		
Titanium	<0.1 mg/kg	TM181		2530 §	136 §	2460 §	2910 §		
Vanadium	<0.2 mg/kg	TM181		163 § #	6.85 § #	67.5 § #	120 § #		
Zinc	<1.9 mg/kg	TM181		309 § M	10.2 § #	42.1 § #	71.3 § #		
Calcium	<21 mg/kg	TM224		7520 §	389 §	397 §	205 §		
Sodium	<7 mg/kg	TM224		268 §	32.4 §	72.2 §	171 §		
Magnesium	<8 mg/kg	TM224		29100 §	709 §	10400 §	17000 §		
Potassium	<16 mg/kg	TM224		22900 §	560 §	18900 §	23300 §		
Silver	<10 mg/kg	TM250		<10 §	<10 §	<10 §	<10 §		

CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.22
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166666			
Sampled Date				
Customer Sample Ref.	SGS 383:0256 BH3A Sample 1			
Depth (m)	3.90 - 4.25			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0507	0.0405	0.101	0.423	0.5	2	25
Barium	0.00558	0.00123	0.0112	0.0196	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000423	0.000392	0.000847	0.00397	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00207	0.000295	0.00415	0.00594	0.5	10	30
Nickel	0.000729	0.000812	0.00146	0.00798	0.4	10	40
Lead	<0.00002	0.000075	<0.00004	0.000624	0.5	10	50
Antimony	<0.00016	<0.00016	<0.00032	<0.0016	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000781	<0.0039	0.1	0.5	7
Zinc	0.000677	<0.00041	0.00136	<0.0041	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	4.75	0.947	9.52	15.9	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	65.8	17.7	132	258	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.358	7.111
Conductivity (µS/cm)	76.00	19.33
Temperature (°C)	19.60	19.50
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.295	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
24/04/2013 08:58:35

08:58:29 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.22
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166666			
Sampled Date				
Customer Sample Ref.	SGS 383:0256 BH3A Sample 1			
Depth (m)	3.90 - 4.25			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.44	7.1	15	72	-	-	-
Aluminium	0.136	0.22	0.273	2.06	-	-	-
Calcium	2.24	1	4.48	12.1	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	5.54	0.713	11.1	15.3	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	1.4	0.2	2.8	4.02	-	-	-
Tungsten	0.0089	<0.0015	0.0178	<0.015	-	-	-
Potassium	11.3	3.85	22.7	51.1	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0645	0.0992	0.129	0.934	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.000178	<0.00016	0.000356	<0.0016	-	-	-
Boron	0.0229	<0.0094	0.0458	<0.094	-	-	-
Cobalt	0.00015	0.000234	0.0003	0.0022	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.218	0.0425	0.437	0.721	-	-	-
Manganese	0.00434	0.00176	0.00869	0.0219	-	-	-
Phosphorus	0.0313	0.0184	0.0626	0.206	-	-	-
Strontium	0.0128	0.00214	0.0256	0.0393	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.000721	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.358	7.111
Conductivity (µS/cm)	76.00	19.33
Temperature (°C)	19.60	19.50
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.295	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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24/04/2013 08:58:35

08:58:29 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.22
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166666			
Sampled Date				
Customer Sample Ref.	SGS 383:0256 BH3A Sample 1			
Depth (m)	3.90 - 4.25			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.0037	0.00414	0.00741	0.0407	-	-	-
Vanadium	0.00508	0.00601	0.0102	0.0586	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
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08:58:29 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.442
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166667			
Sampled Date				
Customer Sample Ref.	SGS 383:0257 BH3A Sample 2			
Depth (m)	10.10 - 10.45			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.00203	0.000979	0.00406	0.0112	0.5	2	25
Barium	0.000886	0.000326	0.00177	0.00401	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000253	<0.00022	0.000506	<0.0022	0.5	10	70
Copper	0.00118	<0.00085	0.00236	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	<0.00024	<0.00024	<0.00048	<0.0024	0.5	10	30
Nickel	<0.00015	0.000183	<0.0003	0.00158	0.4	10	40
Lead	0.000936	0.000526	0.00187	0.00581	0.5	10	50
Antimony	<0.00016	<0.00016	<0.00032	<0.0016	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.00078	<0.0039	0.1	0.5	7
Zinc	0.00141	0.00515	0.00283	0.0465	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	18.8	<5	37.6	<50	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.456	6.24
Conductivity (µS/cm)	18.92	4.84
Temperature (°C)	19.90	20.20
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.235	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.442
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166667			
Sampled Date				
Customer Sample Ref.	SGS 383:0257 BH3A Sample 2			
Depth (m)	10.10 - 10.45			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.53	6.4	13	64	-	-	-
Aluminium	0.016	0.0381	0.0319	0.352	-	-	-
Calcium	1.06	<0.012	2.11	1.42	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	1.51	<0.076	3.01	2.03	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.129	<0.036	0.259	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	2.53	<2.34	5.06	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0238	0.0316	0.0476	0.305	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0926	0.0194	0.185	0.293	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0666	0.0123	0.133	0.195	-	-	-
Manganese	0.00115	0.00175	0.00229	0.0167	-	-	-
Phosphorus	<0.0063	<0.0063	<0.0126	<0.063	-	-	-
Strontium	0.00256	0.000244	0.00512	0.00555	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.00072	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.456	6.24
Conductivity (µS/cm)	18.92	4.84
Temperature (°C)	19.90	20.20
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.235	

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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.442
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166667			
Sampled Date				
Customer Sample Ref.	SGS 383:0257 BH3A Sample 2			
Depth (m)	10.10 - 10.45			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00201	<0.0015	0.00402	<0.015	-	-	-
Vanadium	<0.00024	<0.00024	<0.00048	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.456	6.24
Conductivity (µS/cm)	18.92	4.84
Temperature (°C)	19.90	20.20
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.235	

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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.231
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166668			
Sampled Date				
Customer Sample Ref.	SGS 383:0258 BH3A Sample 3			
Depth (m)	14.00 - 14.35			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.00347	0.00238	0.00695	0.0256	0.5	2	25
Barium	0.00315	0.00404	0.00631	0.0389	20	100	300
Cadmium	<0.0001	0.000334	<0.0002	0.00278	0.04	1	5
Chromium	0.000364	0.00037	0.000729	0.00369	0.5	10	70
Copper	0.00112	<0.00085	0.00224	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00127	0.000458	0.00255	0.00595	0.5	10	30
Nickel	<0.00015	0.000271	<0.0003	0.00225	0.4	10	40
Lead	0.000043	0.00155	0.0000861	0.013	0.5	10	50
Antimony	<0.00016	<0.00016	<0.00032	<0.0016	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000781	<0.0039	0.1	0.5	7
Zinc	0.000493	0.0412	0.000987	0.344	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	0.854	<0.5	1.71	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	30	26.3	60.1	269	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	8.83	6.658
Conductivity (µS/cm)	25.10	10.45
Temperature (°C)	19.70	19.90
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.295	

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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.231
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166668			
Sampled Date				
Customer Sample Ref.	SGS 383:0258 BH3A Sample 3			
Depth (m)	14.00 - 14.35			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.21	7.4	14	73	-	-	-
Aluminium	0.126	0.0697	0.252	0.792	-	-	-
Calcium	3.13	5.73	6.26	52.9	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	1.47	<0.076	2.93	2.48	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.118	<0.036	0.235	<0.36	-	-	-
Tungsten	0.00454	0.00354	0.0091	0.0371	-	-	-
Potassium	4.74	<2.34	9.49	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0738	0.0416	0.148	0.47	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.279	0.0654	0.559	1.01	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	1.2	<1	2.4	<10	-	-	-
Lithium	0.0569	0.00359	0.114	0.126	-	-	-
Manganese	0.000646	0.00189	0.00129	0.0168	-	-	-
Phosphorus	0.0199	<0.0063	0.0399	<0.063	-	-	-
Strontium	0.00397	0.00459	0.00794	0.0448	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.000721	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	8.83	6.658
Conductivity (µS/cm)	25.10	10.45
Temperature (°C)	19.70	19.90
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.295	

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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

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Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166668			
Sampled Date				
Customer Sample Ref.	SGS 383:0258 BH3A Sample 3			
Depth (m)	14.00 - 14.35			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00455	0.00243	0.00911	0.0279	-	-	-
Vanadium	0.000654	0.000388	0.00131	0.00433	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	8.83	6.658
Conductivity (µS/cm)	25.10	10.45
Temperature (°C)	19.70	19.90
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.295	

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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.614
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.4
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166670			
Sampled Date				
Customer Sample Ref.	SGS 383:0259 BH3A Sample 4			
Depth (m)	21.35 - 21.75			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0513	0.0176	0.103	0.223	0.5	2	25
Barium	0.00241	0.002	0.00481	0.0206	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000739	0.00041	0.00148	0.00455	0.5	10	70
Copper	0.00179	<0.00085	0.00358	<0.0085	2	50	100
Mercury Dissolved (CVAF)	0.000109	<0.00001	0.000219	0.00015	0.01	0.2	2
Molybdenum	0.000341	0.00193	0.000682	0.0171	0.5	10	30
Nickel	0.00029	0.000276	0.00058	0.00278	0.4	10	40
Lead	0.0113	0.000112	0.0226	0.0165	0.5	10	50
Antimony	0.000526	0.00459	0.00105	0.0404	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.00078	<0.0039	0.1	0.5	7
Zinc	0.0117	0.00285	0.0234	0.0407	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	0.603	<0.5	1.21	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	31.4	6.62	62.8	100	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.190	5.970
Conductivity (µS/cm)	18.61	6.35
Temperature (°C)	19.70	19.80
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.240	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.614
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.4
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166670			
Sampled Date				
Customer Sample Ref.	SGS 383:0259 BH3A Sample 4			
Depth (m)	21.35 - 21.75			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.15	6.4	14	65	-	-	-
Aluminium	0.122	0.11	0.244	1.11	-	-	-
Calcium	5.67	<0.012	11.4	7.78	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	1.88	<0.076	3.75	2.58	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.144	<0.036	0.289	<0.36	-	-	-
Tungsten	0.0174	0.00534	0.0348	0.07	-	-	-
Potassium	<2.34	<2.34	<4.68	<23.4	-	-	-
Beryllium	<0.00007	0.000161	<0.00014	0.00139	-	-	-
Iron	0.0586	0.0571	0.117	0.573	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.000166	<0.00016	0.000332	<0.0016	-	-	-
Boron	0.0407	0.0159	0.0813	0.193	-	-	-
Cobalt	<0.00006	0.000177	<0.00012	0.00153	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0742	0.0234	0.148	0.303	-	-	-
Manganese	0.00255	0.00376	0.0051	0.0359	-	-	-
Phosphorus	1.09	0.823	2.17	8.6	-	-	-
Strontium	0.00709	0.000967	0.0142	0.0181	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	0.00144	<0.00072	0.0124	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.190	5.970
Conductivity (µS/cm)	18.61	6.35
Temperature (°C)	19.70	19.80
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.240	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.614
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.4
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166670			
Sampled Date				
Customer Sample Ref.	SGS 383:0259 BH3A Sample 4			
Depth (m)	21.35 - 21.75			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00548	0.00689	0.011	0.0669	-	-	-
Vanadium	0.00913	0.00469	0.0183	0.053	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.190	5.970
Conductivity (µS/cm)	18.61	6.35
Temperature (°C)	19.70	19.80
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.240	

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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.837
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.2
Particle Size <4mm	>95%		

Case	
SDG	130402-19
Lab Sample Number(s)	7166672
Sampled Date	
Customer Sample Ref.	SGS 383:0260 BH3A Sample 5
Depth (m)	26.30 - 26.70

Solid Waste Analysis

		Landfill Waste Acceptance Criteria Limits		
		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0594	0.0463	0.119	0.481	0.5	2	25
Barium	0.0148	0.00258	0.0297	0.0433	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000654	0.000399	0.00131	0.00436	0.5	10	70
Copper	0.000865	0.00175	0.00173	0.0162	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00206	0.000596	0.00413	0.00805	0.5	10	30
Nickel	0.00101	0.000753	0.00202	0.0079	0.4	10	40
Lead	0.00342	0.0134	0.00686	0.12	0.5	10	50
Antimony	0.000985	0.000498	0.00197	0.00568	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000781	<0.0039	0.1	0.5	7
Zinc	0.00177	0.0246	0.00355	0.213	4	50	200
Chloride	<2	<2	<4.01	<20	800	15000	25000
Fluoride	4.67	1.02	9.36	15.4	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	90.8	30.2	182	389	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information

	2:1	8:1
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.941	7.151
Conductivity (µS/cm)	78.40	21.70
Temperature (°C)	19.60	19.90
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.250	

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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.837
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.2
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166672			
Sampled Date				
Customer Sample Ref.	SGS 383:0260 BH3A Sample 5			
Depth (m)	26.30 - 26.70			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.8	7.3	16	74	-	-	-
Aluminium	0.174	0.29	0.348	2.73	-	-	-
Calcium	10.6	4.54	21.3	54	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	5.58	0.858	11.2	15.3	-	-	-
Zirconium	<0.002	<0.002	<0.00401	<0.02	-	-	-
Magnesium	1.27	0.176	2.54	3.33	-	-	-
Tungsten	0.00644	<0.0015	0.0129	<0.015	-	-	-
Potassium	10.8	4.18	21.5	51.3	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0703	0.106	0.141	1.01	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0284	<0.0094	0.057	<0.094	-	-	-
Cobalt	0.000133	0.000196	0.000266	0.00187	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.21	0.0515	0.421	0.741	-	-	-
Manganese	0.00292	0.00141	0.00584	0.0163	-	-	-
Phosphorus	0.0363	0.0417	0.0728	0.409	-	-	-
Strontium	0.0255	0.0116	0.051	0.136	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.000721	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.941	7.151
Conductivity (µS/cm)	78.40	21.70
Temperature (°C)	19.60	19.90
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.250	

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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.837
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.2
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166672			
Sampled Date				
Customer Sample Ref.	SGS 383:0260 BH3A Sample 5			
Depth (m)	26.30 - 26.70			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00371	0.00459	0.00742	0.0446	-	-	-
Vanadium	0.00565	0.00624	0.0113	0.0616	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.941	7.151
Conductivity (µS/cm)	78.40	21.70
Temperature (°C)	19.60	19.90
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.250	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.867
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.1
Particle Size <4mm	>95%		

Case	
SDG	130402-19
Lab Sample Number(s)	7166673
Sampled Date	
Customer Sample Ref.	SGS 383:0261 BH3A Sample 6
Depth (m)	30.45 - 30.90

Solid Waste Analysis		**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.0157	0.0128	0.0314	0.132	0.5	2	25
Barium	0.00298	0.00101	0.00596	0.013	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.00047	0.000426	0.000939	0.00432	0.5	10	70
Copper	0.00284	0.00218	0.00567	0.0228	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00159	0.000734	0.00318	0.00861	0.5	10	30
Nickel	0.000873	0.000835	0.00174	0.0084	0.4	10	40
Lead	0.000226	0.000207	0.000451	0.0021	0.5	10	50
Antimony	<0.00016	<0.00016	<0.00032	<0.0016	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	0.00134	0.000971	0.00268	0.0103	4	50	200
Chloride	<2	<2	<3.99	<20	800	15000	25000
Fluoride	4.94	1.37	9.86	19	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	51.7	13.1	103	188	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.629	5.970
Conductivity (µS/cm)	57.20	6.35
Temperature (°C)	19.90	19.80
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.260	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.867
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.1
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166673			
Sampled Date				
Customer Sample Ref.	SGS 383:0261 BH3A Sample 6			
Depth (m)	30.45 - 30.90			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.2	6.8	14	69	-	-	-
Aluminium	0.131	0.131	0.261	1.31	-	-	-
Calcium	2.25	<0.012	4.5	3.34	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	4.74	<0.076	9.47	7.04	-	-	-
Zirconium	<0.002	<0.002	<0.00399	<0.02	-	-	-
Magnesium	1.26	0.195	2.52	3.53	-	-	-
Tungsten	0.0401	0.0131	0.08	0.171	-	-	-
Potassium	7.77	2.37	15.5	31.7	-	-	-
Beryllium	<0.00007	0.000084	<0.00014	0.000715	-	-	-
Iron	0.115	0.153	0.23	1.47	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0265	<0.0094	0.0529	<0.094	-	-	-
Cobalt	0.000221	0.0002	0.000441	0.00203	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.145	0.028	0.29	0.453	-	-	-
Manganese	0.00662	0.00252	0.0132	0.0313	-	-	-
Phosphorus	0.0448	0.0113	0.0894	0.163	-	-	-
Strontium	0.0113	0.00154	0.0225	0.0299	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.000719	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.629	5.970
Conductivity (µS/cm)	57.20	6.35
Temperature (°C)	19.90	19.80
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.260	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.867
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.1
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166673			
Sampled Date				
Customer Sample Ref.	SGS 383:0261 BH3A Sample 6			
Depth (m)	30.45 - 30.90			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00469	0.00448	0.00936	0.0451	-	-	-
Vanadium	0.00424	0.00368	0.00846	0.0376	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.629	5.970
Conductivity (µS/cm)	57.20	6.35
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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.179	**Moisture Content Ratio (%)**	2.32
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	97.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166674			
Sampled Date				
Customer Sample Ref.	SGS 383:0262 BH3A Sample 7			
Depth (m)	35.15 - 35.50			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0109	0.01	0.0219	0.101	0.5	2	25
Barium	0.000971	0.00107	0.00194	0.0105	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000292	<0.00022	0.000584	<0.0022	0.5	10	70
Copper	0.00268	0.00225	0.00536	0.0231	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.000357	<0.00024	0.000714	<0.0024	0.5	10	30
Nickel	0.000306	0.000325	0.000612	0.00322	0.4	10	40
Lead	0.000502	0.00229	0.001	0.0202	0.5	10	50
Antimony	0.000339	<0.00016	0.000678	<0.0016	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.00078	<0.0039	0.1	0.5	7
Zinc	0.0111	0.0218	0.0221	0.202	4	50	200
Chloride	3.3	<2	6.6	<20	800	15000	25000
Fluoride	1.05	0.94	2.11	9.59	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	18.2	7.37	36.4	90.4	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.382	6.899
Conductivity (µS/cm)	17.59	8.40
Temperature (°C)	19.70	19.80
Volume Leachant (Litres)	0.346	1.400
Volume of Eluate VE1 (Litres)	0.270	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.179	**Moisture Content Ratio (%)**	2.32
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	97.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166674			
Sampled Date				
Customer Sample Ref.	SGS 383:0262 BH3A Sample 7			
Depth (m)	35.15 - 35.50			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.32	6.2	13	62	-	-	-
Aluminium	0.0669	0.0906	0.134	0.87	-	-	-
Calcium	0.683	<0.012	1.37	1.05	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	2.75	0.825	5.51	11.2	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.21	<0.036	0.42	<0.36	-	-	-
Tungsten	0.00169	<0.0015	0.00338	<0.015	-	-	-
Potassium	<2.34	<2.34	<4.68	<23.4	-	-	-
Beryllium	<0.00007	0.000134	<0.00014	0.00113	-	-	-
Iron	0.0582	0.0542	0.116	0.548	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0635	0.0131	0.127	0.209	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0278	0.0122	0.0555	0.146	-	-	-
Manganese	0.0017	0.000893	0.00339	0.0102	-	-	-
Phosphorus	0.114	0.111	0.228	1.12	-	-	-
Strontium	0.00195	0.00132	0.00389	0.0141	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.00072	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.382	6.899
Conductivity (µS/cm)	17.59	8.40
Temperature (°C)	19.70	19.80
Volume Leachant (Litres)	0.346	1.400
Volume of Eluate VE1 (Litres)	0.270	

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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.179	**Moisture Content Ratio (%)**	2.32
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	97.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166674			
Sampled Date				
Customer Sample Ref.	SGS 383:0262 BH3A Sample 7			
Depth (m)	35.15 - 35.50			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00462	0.00265	0.00924	0.0295	-	-	-
Vanadium	0.00411	0.00487	0.00823	0.0475	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.382	6.899
Conductivity (µS/cm)	17.59	8.40
Temperature (°C)	19.70	19.80
Volume Leachant (Litres)	0.346	1.400
Volume of Eluate VE1 (Litres)	0.270	

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SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

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WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.11
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166675			
Sampled Date				
Customer Sample Ref.	SGS 383:0263 BH3A Sample 8			
Depth (m)	38.70 - 38.95			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.00073	0.000997	0.00146	0.00952	0.5	2	25
Barium	0.0166	0.0247	0.0331	0.233	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000636	0.000263	0.00127	0.00326	0.5	10	70
Copper	0.00121	<0.00085	0.00242	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00114	0.000381	0.00228	0.00509	0.5	10	30
Nickel	0.000259	<0.00015	0.000518	<0.0015	0.4	10	40
Lead	0.000177	0.000748	0.000354	0.00652	0.5	10	50
Antimony	0.000844	0.000388	0.00169	0.00465	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.00078	<0.0039	0.1	0.5	7
Zinc	0.00305	<0.00041	0.00609	0.00514	4	50	200
Chloride	3.7	<2	7.4	<20	800	15000	25000
Fluoride	0.6	<0.5	1.2	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	33	6.07	66	106	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.134	7.030
Conductivity (µS/cm)	40.40	7.27
Temperature (°C)	19.40	19.80
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.295	

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CERTIFICATE OF ANALYSIS

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Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

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WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.11
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166675			
Sampled Date				
Customer Sample Ref.	SGS 383:0263 BH3A Sample 8			
Depth (m)	38.70 - 38.95			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.14	6.5	14	66	-	-	-
Aluminium	0.0891	0.0746	0.178	0.771	-	-	-
Calcium	3.17	<0.012	6.35	5.34	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	2.51	<0.076	5.03	4.23	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.845	0.285	1.69	3.79	-	-	-
Tungsten	0.0323	0.0126	0.0646	0.159	-	-	-
Potassium	3.65	<2.34	7.3	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0932	0.072	0.187	0.756	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	0.000181	<0.00032	<0.0016	-	-	-
Boron	1.49	0.288	2.98	4.91	-	-	-
Cobalt	0.000085	<0.00006	0.00017	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0121	<0.00192	0.0243	0.0204	-	-	-
Manganese	0.0101	0.00682	0.0201	0.0737	-	-	-
Phosphorus	0.0132	0.00959	0.0265	0.102	-	-	-
Strontium	0.0184	0.0055	0.0369	0.0767	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	0.00102	<0.00036	0.00205	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.134	7.030
Conductivity (µS/cm)	40.40	7.27
Temperature (°C)	19.40	19.80
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.295	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.11
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166675			
Sampled Date				
Customer Sample Ref.	SGS 383:0263 BH3A Sample 8			
Depth (m)	38.70 - 38.95			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00399	0.0027	0.00799	0.0292	-	-	-
Vanadium	0.000468	<0.00024	0.000937	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.134	7.030
Conductivity (µS/cm)	40.40	7.27
Temperature (°C)	19.40	19.80
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.295	

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Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.0901
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166676			
Sampled Date				
Customer Sample Ref.	SGS 383:0264 BH3A Sample 9			
Depth (m)	43.15 - 43.60			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.00599	0.00202	0.012	0.0262	0.5	2	25
Barium	0.0065	0.00117	0.013	0.0198	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.0008	0.00023	0.0016	0.00316	0.5	10	70
Copper	0.00175	0.00651	0.00351	0.0579	2	50	100
Mercury Dissolved (CVAF)	0.0000142	<0.00001	0.0000283	<0.0001	0.01	0.2	2
Molybdenum	0.00115	0.000517	0.00231	0.00613	0.5	10	30
Nickel	0.00022	<0.00015	0.00044	<0.0015	0.4	10	40
Lead	0.0393	0.000026	0.0787	0.0597	0.5	10	50
Antimony	0.000584	<0.00016	0.00117	<0.0016	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.00078	<0.0039	0.1	0.5	7
Zinc	0.135	0.00472	0.269	0.245	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	35.7	6.67	71.4	111	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.790	6.224
Conductivity (µS/cm)	18.21	6.28
Temperature (°C)	19.00	20.20
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.265	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.0901
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166676			
Sampled Date				
Customer Sample Ref.	SGS 383:0264 BH3A Sample 9			
Depth (m)	43.15 - 43.60			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.16	6.5	14	66	-	-	-
Aluminium	0.12	0.0474	0.24	0.584	-	-	-
Calcium	6.45	0.102	12.9	10.6	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	1.36	<0.076	2.71	2.06	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.212	<0.036	0.424	<0.36	-	-	-
Tungsten	0.00229	0.00153	0.00457	0.0164	-	-	-
Potassium	2.36	<2.34	4.73	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0489	0.0208	0.0978	0.251	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0412	<0.0094	0.0825	<0.094	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0159	0.00412	0.0318	0.059	-	-	-
Manganese	0.00143	0.00144	0.00286	0.0144	-	-	-
Phosphorus	0.0259	<0.0063	0.0517	<0.063	-	-	-
Strontium	0.0101	0.00172	0.0201	0.0299	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.00072	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.790	6.224
Conductivity (µS/cm)	18.21	6.28
Temperature (°C)	19.00	20.20
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.265	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.0901
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166676			
Sampled Date				
Customer Sample Ref.	SGS 383:0264 BH3A Sample 9			
Depth (m)	43.15 - 43.60			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.0028	0.0016	0.00561	0.0178	-	-	-
Vanadium	0.000805	0.000431	0.00161	0.00488	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.790	6.224
Conductivity (µS/cm)	18.21	6.28
Temperature (°C)	19.00	20.20
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.265	

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CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	2
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98
Particle Size <4mm	>95%		

Case	
SDG	130402-19
Lab Sample Number(s)	7166679
Sampled Date	
Customer Sample Ref.	SGS 383:0265 BH3A Sample 10
Depth (m)	47.20 - 47.60

Solid Waste Analysis

		Landfill Waste Acceptance Criteria Limits		
		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.00772	0.00481	0.0155	0.0521	0.5	2	25
Barium	0.00495	0.00242	0.00991	0.0277	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000646	0.000244	0.00129	0.00299	0.5	10	70
Copper	0.00123	<0.00085	0.00247	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	<0.00024	0.000357	<0.000481	0.00308	0.5	10	30
Nickel	0.000152	<0.00015	0.000304	<0.0015	0.4	10	40
Lead	0.00102	0.000781	0.00205	0.00814	0.5	10	50
Antimony	<0.00016	0.000374	<0.000321	0.00323	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000781	<0.0039	0.1	0.5	7
Zinc	0.00624	0.0158	0.0125	0.145	4	50	200
Chloride	3.5	<2	7.01	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	37.1	10.3	74.3	140	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information

	2:1	8:1
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.730	5.874
Conductivity (µS/cm)	19.35	6.97
Temperature (°C)	19.70	20.10
Volume Leachant (Litres)	0.347	1.400
Volume of Eluate VE1 (Litres)	0.240	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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08:58:29 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	2
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166679			
Sampled Date				
Customer Sample Ref.	SGS 383:0265 BH3A Sample 10	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Depth (m)	47.20 - 47.60			
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.1	6.5	14	66	-	-	-
Aluminium	0.047	0.0389	0.0942	0.4	-	-	-
Calcium	6.47	0.924	13	16.8	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	1.97	0.0902	3.94	3.48	-	-	-
Zirconium	<0.002	<0.002	<0.00401	<0.02	-	-	-
Magnesium	0.129	<0.036	0.259	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	<2.34	<2.34	<4.69	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	<0.019	<0.019	<0.0381	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.000321	<0.0016	-	-	-
Boron	0.0165	<0.0094	0.0331	<0.094	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0181	0.0072	0.0363	0.087	-	-	-
Manganese	0.00105	0.0122	0.00211	0.106	-	-	-
Phosphorus	0.0186	<0.0063	0.0373	<0.063	-	-	-
Strontium	0.0079	0.00427	0.0158	0.0477	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.000721	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.730	5.874
Conductivity (µS/cm)	19.35	6.97
Temperature (°C)	19.70	20.10
Volume Leachant (Litres)	0.347	1.400
Volume of Eluate VE1 (Litres)	0.240	

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08:58:29 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	2
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-19			
Lab Sample Number(s)	7166679			
Sampled Date				
Customer Sample Ref.	SGS 383:0265 BH3A Sample 10			
Depth (m)	47.20 - 47.60			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	0.000555	0.000421	0.00111	0.0044	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.730	5.874
Conductivity (µS/cm)	19.35	6.97
Temperature (°C)	19.70	20.10
Volume Leachant (Litres)	0.347	1.400
Volume of Eluate VE1 (Litres)	0.240	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
24/04/2013 08:58:35

08:58:29 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM114		Leaching Procedure for CEN Two Stage BatchTest 2:1/8:1 Cumulative		
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM224	US EPA Method 6010B	Determination of Alkaline Metals by iCap 6500 Duo ICP-OES		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM250		Determination of Silver in Soil by ICP-OES		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM283		Determination of Dissolved Niobium, Tungsten, and Zirconium in Water Matrices by ICP-MS		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	7166666	7166667	7166668	7166670	7166672	7166673	7166674	7166675	7166676	7166679
Customer Sample Ref.	SGS 383:0256 BH 3A Sample 1	SGS 383:0257 BH 3A Sample 2	SGS 383:0258 BH 3A Sample 3	SGS 383:0259 BH 3A Sample 4	SGS 383:0260 BH 3A Sample 5	SGS 383:0261 BH 3A Sample 6	SGS 383:0262 BH 3A Sample 7	SGS 383:0263 BH 3A Sample 8	SGS 383:0264 BH 3A Sample 9	SGS 383:0265 BH 3A Sample 10
AGS Ref.										
Depth	3.90 - 4.25	10.10 - 10.45	14.00 - 14.35	21.35 - 21.75	26.30 - 26.70	30.45 - 30.90	35.15 - 35.50	38.70 - 38.95	43.15 - 43.60	47.20 - 47.60
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Alkali Metals by iCap-OES (Soil)	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013
Anions by Kone (w)	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013
CEN 2:1 Leachate (2 Stage)	04-Apr-2013	04-Apr-2013	04-Apr-2013	04-Apr-2013	04-Apr-2013	04-Apr-2013	04-Apr-2013	04-Apr-2013	04-Apr-2013	04-Apr-2013
CEN 2:1 Readings	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013
CEN 8:1 Leachate (2 Stage)	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013
CEN 8:1 Readings	10-Apr-2013	10-Apr-2013	10-Apr-2013	10-Apr-2013	10-Apr-2013	10-Apr-2013	10-Apr-2013	10-Apr-2013	10-Apr-2013	10-Apr-2013
Dissolved Metals by ICP-MS	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013
Dissolved W, Nb and Zr by ICP-MS	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013
Fluoride	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013
Mercury Dissolved	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	18-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013
Metals by iCap-OES Dissolved (W)	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013
Metals in solid samples by OES	24-Apr-2013	24-Apr-2013	24-Apr-2013	24-Apr-2013	24-Apr-2013	24-Apr-2013	24-Apr-2013	23-Apr-2013	24-Apr-2013	24-Apr-2013
pH Value of Filtered Water	10-Apr-2013	10-Apr-2013	10-Apr-2013	11-Apr-2013	10-Apr-2013	11-Apr-2013	10-Apr-2013	10-Apr-2013	10-Apr-2013	10-Apr-2013
Sample description	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013
Silver	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013
Total Dissolved Solids	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	10-Apr-2013

SDG:	130402-19	**Location:**	Leachate Analysis	**Order Number:**	7970
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221667
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -
Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

ALcontrol Laboratories

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Website: www.alcontrol.com

Coffey Geotechnics Limited
9/11 Hornbeam Square South
Hornbeam Park
Harrogate
North Yorkshire
HG2 8NB

Attention: Lesley MacCormack

CERTIFICATE OF ANALYSIS

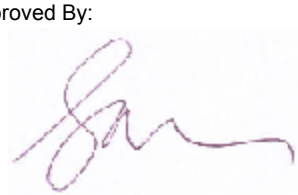
Date:	24 April 2013
Customer:	H_COFFEYGEO_HGT
Sample Delivery Group (SDG):	130411-7
Your Reference:	
Location:	Leachate Analysis
Report No:	221668

We received 10 samples on Wednesday April 10, 2013 and 10 of these samples were scheduled for analysis which was completed on Wednesday April 24, 2013. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
7215269	SGS 383: 0346 BH4 Sample 1		0.00	08/04/2013
7215270	SGS 383: 0347 BH4 Sample 2		0.00	08/04/2013
7215271	SGS 383: 0348 BH4 Sample 3		0.00	08/04/2013
7215272	SGS 383: 0349 BH4 Sample 4		0.00	08/04/2013
7215273	SGS 383: 0350 BH4 Sample 5		0.00	08/04/2013
7215274	SGS 383: 0351 BH4 Sample 6		0.00	08/04/2013
7215275	SGS 383: 0352 BH4 Sample 7		0.00	08/04/2013
7215276	SGS 383: 0353 BH4 Sample 8		0.00	08/04/2013
7215278	SGS 383: 0354 BH4 Sample 9		0.00	08/04/2013
7215279	SGS 383: 0355 BH4 Sample 10		0.00	08/04/2013

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

SOLID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			7215269	SGS 383: 0346 BH4		0.00	BAG
			7215270	SGS 383: 0347 BH4		0.00	BAG
			7215271	SGS 383: 0348 BH4		0.00	BAG
			7215272	SGS 383: 0349 BH4		0.00	BAG
			7215273	SGS 383: 0350 BH4		0.00	BAG
			7215274	SGS 383: 0351 BH4		0.00	BAG
			7215275	SGS 383: 0352 BH4		0.00	BAG
			7215276	SGS 383: 0353 BH4		0.00	BAG
			7215278	SGS 383: 0354 BH4		0.00	BAG
			7215279	SGS 383: 0355 BH4		0.00	BAG
Alkali Metals by iCap-OES (Soil)	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
CEN 2:1 Readings	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
CEN 8:1 Readings	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Dissolved W, Nb and Zr by ICP-MS	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Fluoride	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Mercury Dissolved	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Metals in solid samples by OES	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Metals Ultra Low	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
pH Value of Filtered Water	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Sample description	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Silver	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Total Dissolved Solids	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X

CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
7215269	SGS 383: 0346 BH4 Sample 1	0.00	Beige	Dry Sample Received	0.1 - 2 mm	Stones	None
7215270	SGS 383: 0347 BH4 Sample 2	0.00	Light Brown	Dry Sample Received	2 - 10 mm	Stones	None
7215271	SGS 383: 0348 BH4 Sample 3	0.00	Beige	Dry Sample Received	0.1 - 2 mm	Stones	None
7215272	SGS 383: 0349 BH4 Sample 4	0.00	Light Brown	Dry Sample Received	2 - 10 mm	Stones	None
7215273	SGS 383: 0350 BH4 Sample 5	0.00	Beige	Dry Sample Received	0.1 - 2 mm	Stones	None
7215274	SGS 383: 0351 BH4 Sample 6	0.00	Light Brown	Dry Sample Received	0.1 - 2 mm	Stones	None
7215275	SGS 383: 0352 BH4 Sample 7	0.00	Light Brown	Dry Sample Received	0.1 - 2 mm	Stones	None
7215276	SGS 383: 0353 BH4 Sample 8	0.00	Beige	Dry Sample Received	0.1 - 2 mm	Stones	None
7215278	SGS 383: 0354 BH4 Sample 9	0.00	Light Brown	Dry Sample Received	0.1 - 2 mm	Stones	None
7215279	SGS 383: 0355 BH4 Sample 10	0.00	Grey	Dry Sample Received	0.1 - 2 mm	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	SGS 383: 0346 B H4 Sample 1	SGS 383: 0347 B H4 Sample 2	SGS 383: 0348 B H4 Sample 3	SGS 383: 0349 B H4 Sample 4	SGS 383: 0350 B H4 Sample 5	SGS 383: 0351 B H4 Sample 6
			Depth (m)	0.00	0.00	0.00	0.00	0.00	0.00
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	08/04/2013	08/04/2013	08/04/2013	08/04/2013	08/04/2013	08/04/2013
			Sample Time	.	.	.	.	.	.
			Date Received	10/04/2013	10/04/2013	10/04/2013	10/04/2013	10/04/2013	10/04/2013
			SDG Ref	130411-7	130411-7	130411-7	130411-7	130411-7	130411-7
			Lab Sample No.(s)	7215269	7215270	7215271	7215272	7215273	7215274
			AGS Reference						
Aluminium	<11 mg/kg	TM181		33000	49700	34900	24200	15500	21800
Antimony	<0.6 mg/kg	TM181		1.7 #	0.643 #	1.52 #	<0.6 #	5.74 #	0.703 #
Arsenic	<0.6 mg/kg	TM181		117 #	661 #	764 #	252 #	1340 #	208 #
Barium	<0.6 mg/kg	TM181		200 #	215 #	285 #	123 #	255 #	141 #
Beryllium	<0.01 mg/kg	TM181		1.26 #	4.79 #	3.57 #	0.943 #	7.19 #	1.44 #
Boron	<0.7 mg/kg	TM181		1.03 #	2.01 #	0.891 #	<0.7 #	1.34 #	2.86 #
Cadmium	<0.02 mg/kg	TM181		0.233 #	0.0949 #	1.03 #	<0.02 #	0.0771 #	0.61 #
Chromium	<0.9 mg/kg	TM181		70.7 #	80.3 #	75.1 #	58.1 #	30.4 #	42.5 #
Cobalt	<0.1 mg/kg	TM181		5.62 #	43.3 #	13.5 #	7.91 #	5.03 #	7.19 #
Copper	<1.4 mg/kg	TM181		45.7 #	231 #	135 #	73.4 #	195 #	28.4 #
Iron	<1000 mg/kg	TM181		22500 #	61300 #	38100 #	30200 #	47100 #	39900 #
Lead	<0.7 mg/kg	TM181		10.8 #	16 #	12 #	10.6 #	8.46 #	5.65 #
Manganese	<0.13 mg/kg	TM181		309 #	718 #	427 #	206 #	281 #	369 #
Mercury	<0.14 mg/kg	TM181		<0.14 #	<0.14 #	<0.14 #	<0.14 #	<0.14 #	<0.14 #
Molybdenum	<0.1 mg/kg	TM181		1.02 #	0.975 #	2.62 #	0.621 #	5.39 #	0.556 #
Nickel	<0.2 mg/kg	TM181		13.7 #	83.7 #	34.5 #	17.4 #	11.7 #	29.1 #
Phosphorus	<1 mg/kg	TM181		127	297	541	236	1030	163
Selenium	<1 mg/kg	TM181		<1 #	<1 #	<1 #	<1 #	3.55 #	<1 #
Strontium	<0.4 mg/kg	TM181		29.3 #	47.5 #	67.6 #	15.8 #	164 #	43.2 #
Tin	<0.24 mg/kg	TM181		5.98 #	26.6 #	8.51 #	4.48 #	9.29 #	17.1 #
Thallium	<0.7 mg/kg	TM181		<0.7 #	1.65 #	<0.7 #	<0.7 #	3.26 #	<0.7 #
Titanium	<0.1 mg/kg	TM181		1450	2070	1700	1420	376	1610
Vanadium	<0.2 mg/kg	TM181		80.7 #	109 #	106 #	108 #	71.2 #	65.9 #
Zinc	<1.9 mg/kg	TM181		43.5 #	211 #	102 #	169 #	38.9 #	57 #
Calcium	<21 mg/kg	TM224		128	7230	772	347	231	213
Sodium	<7 mg/kg	TM224		28.5	1390	122	71.1	<7	43.4
Magnesium	<8 mg/kg	TM224		6490	11100	9040	5240	1030	5870
Potassium	<16 mg/kg	TM224		10100	13800	12500	9500	2180	12300
Silver	<10 mg/kg	TM250		<10	<10	<10	<10	<10	<10

CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	SGS 383: 0352 B H4 Sample 7	SGS 383: 0353 B H4 Sample 8	SGS 383: 0354 B H4 Sample 9	SGS 383: 0355 B H4 Sample 10		
			Depth (m)	0.00	0.00	0.00	0.00		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	08/04/2013	08/04/2013	08/04/2013	08/04/2013		
			Sample Time	.	.	.	.		
			Date Received	10/04/2013	10/04/2013	10/04/2013	10/04/2013		
			SDG Ref	130411-7	130411-7	130411-7	130411-7		
			Lab Sample No.(s)	7215275	7215276	7215278	7215279		
			AGS Reference						
Aluminium	<11 mg/kg	TM181		27700	27500	29200	51900		
Antimony	<0.6 mg/kg	TM181		1.04 #	1.22 #	1.05 #	0.822 #		
Arsenic	<0.6 mg/kg	TM181		223 #	605 #	127 #	182 #		
Barium	<0.6 mg/kg	TM181		211 #	256 #	108 #	93.2 #		
Beryllium	<0.01 mg/kg	TM181		1.2 #	2.11 #	1.4 #	2.61 #		
Boron	<0.7 mg/kg	TM181		2.09 #	0.917 #	0.954 #	2.14 #		
Cadmium	<0.02 mg/kg	TM181		0.561 #	0.154 #	0.581 #	0.554 #		
Chromium	<0.9 mg/kg	TM181		51.8 #	63.6 #	56.7 #	62.9 #		
Cobalt	<0.1 mg/kg	TM181		7.59 #	5.23 #	16.9 #	46 #		
Copper	<1.4 mg/kg	TM181		19.8 #	70.4 #	106 #	34.8 #		
Iron	<1000 mg/kg	TM181		41700 #	21200 #	46400 #	36600 #		
Lead	<0.7 mg/kg	TM181		6.77 #	12.3 #	5.69 #	9.42 #		
Manganese	<0.13 mg/kg	TM181		431 #	371 #	720 #	1390 #		
Mercury	<0.14 mg/kg	TM181		<0.14 #	<0.14 #	<0.14 #	<0.14 #		
Molybdenum	<0.1 mg/kg	TM181		<0.1 #	1.12 #	0.317 #	<0.1 #		
Nickel	<0.2 mg/kg	TM181		34.6 #	15.7 #	48.6 #	120 #		
Phosphorus	<1 mg/kg	TM181		191	197	384	287		
Selenium	<1 mg/kg	TM181		<1 #	<1 #	<1 #	<1 #		
Strontium	<0.4 mg/kg	TM181		46.2 #	52.2 #	8.47 #	94.7 #		
Tin	<0.24 mg/kg	TM181		18.9 #	15.4 #	4.73 #	4.8 #		
Thallium	<0.7 mg/kg	TM181		<0.7 #	<0.7 #	0.714 #	4.65 #		
Titanium	<0.1 mg/kg	TM181		2180	1200	2500	2190		
Vanadium	<0.2 mg/kg	TM181		76.5 #	80.1 #	83.7 #	81.6 #		
Zinc	<1.9 mg/kg	TM181		55.7 #	46.3 #	141 #	1520 #		
Calcium	<21 mg/kg	TM224		239	243	947	24000		
Sodium	<7 mg/kg	TM224		83.1	42.7	120	3360		
Magnesium	<8 mg/kg	TM224		8290	4200	10200	8360		
Potassium	<16 mg/kg	TM224		17500	6820	18400	12400		
Silver	<10 mg/kg	TM250		<10	<10	<10	<10		

CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.634
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.4
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215269			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0346 BH4 Sample 1			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.000978	0.000428	0.00196	0.00511	0.5	2	25
Barium	0.0813	0.0013	0.163	0.134	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.00028	0.000645	0.00056	0.0059	0.5	10	70
Copper	0.00635	<0.00085	0.0127	0.00962	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	<0.00024	<0.00024	<0.00048	<0.0024	0.5	10	30
Nickel	0.000805	0.000541	0.00161	0.00581	0.4	10	40
Lead	0.199	0.000159	0.398	0.303	0.5	10	50
Antimony	<0.00016	<0.00016	<0.00032	<0.0016	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.00078	<0.0039	0.1	0.5	7
Zinc	0.0164	<0.00041	0.0328	0.0248	4	50	200
Chloride	14.2	<2	28.4	21.5	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	45.1	8.97	90.2	144	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	6.384	6.336
Conductivity (µS/cm)	50.20	8.93
Temperature (°C)	21.10	19.70
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.265	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
24/04/2013 08:59:52

08:59:45 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.634
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.4
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215269			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0346 BH4 Sample 1			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	5.49	5.8	11	58	-	-	-
Aluminium	0.0542	0.0121	0.108	0.185	-	-	-
Calcium	0.937	<0.012	1.87	1.42	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	0	<0.00001	0.0000412	<0.0001	-	-	-
Sodium	2.97	0.152	5.95	5.78	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	1.14	0.109	2.29	2.65	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	3.7	<2.34	7.41	<23.4	-	-	-
Beryllium	0.000223	<0.00007	0.000446	<0.0007	-	-	-
Iron	0.0385	<0.019	0.077	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	<0.0094	<0.0094	<0.0188	<0.094	-	-	-
Cobalt	0.000613	0.000075	0.00123	0.00156	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0672	0.0177	0.135	0.252	-	-	-
Manganese	0.0166	0.0052	0.0333	0.0693	-	-	-
Phosphorus	0.0143	<0.0063	0.0285	<0.063	-	-	-
Strontium	0.00934	0.00108	0.0187	0.0233	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	6.384	6.336
Conductivity (µS/cm)	50.20	8.93
Temperature (°C)	21.10	19.70
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.265	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Mcerts Certification does not apply to leachates
24/04/2013 08:59:52

08:59:45 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.634
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.4
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215269			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0346 BH4 Sample 1			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	<0.00036	<0.00036	<0.00072	<0.0036	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00209	<0.0015	0.00419	<0.015	-	-	-
Vanadium	<0.00024	<0.00024	<0.00048	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	6.384	6.336
Conductivity (µS/cm)	50.20	8.93
Temperature (°C)	21.10	19.70
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.265	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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08:59:45 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.746
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.3
Particle Size <4mm	>95%		

Case	
SDG	130411-7
Lab Sample Number(s)	7215270
Sampled Date	08-Apr-2013
Customer Sample Ref.	SGS 383: 0347 BH4 Sample 2
Depth (m)	0.00

Solid Waste Analysis		**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.00852	0.0082	0.0171	0.0825	0.5	2	25
Barium	0.00313	<0.00003	0.00626	0.00456	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	<0.00022	0.0027	<0.00044	0.0231	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00204	0.000285	0.00409	0.00541	0.5	10	30
Nickel	0.000457	0.00178	0.000915	0.0159	0.4	10	40
Lead	0.000304	0.000141	0.000609	0.00165	0.5	10	50
Antimony	0.00643	0.000561	0.0129	0.0142	0.06	0.7	5
Selenium	0.00104	<0.00039	0.00208	<0.0039	0.1	0.5	7
Zinc	0.00201	<0.00041	0.00402	<0.0041	4	50	200
Chloride	7.1	<2	14.2	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	52.4	15.7	105	211	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.973	7.774
Conductivity (µS/cm)	65.60	13.37
Temperature (°C)	20.90	18.00
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.255	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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24/04/2013 08:59:52

08:59:45 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.746
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.3
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215270			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0347 BH4 Sample 2			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.34	6.3	13	63	-	-	-
Aluminium	0.0498	0.0993	0.0997	0.921	-	-	-
Calcium	0.177	<0.012	0.354	0.258	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	<0.00001	<0.00001	<0.00002	<0.0001	-	-	-
Sodium	9.98	2	20	31.6	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.102	<0.036	0.204	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	3.42	<2.34	6.85	<23.4	-	-	-
Beryllium	0.000249	<0.00007	0.000498	<0.0007	-	-	-
Iron	<0.019	0.0314	<0.038	0.268	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0179	<0.0094	0.0358	<0.094	-	-	-
Cobalt	0.000546	0.000108	0.00109	0.00172	-	-	-
Sulphate (soluble) as S	4.67	<1	9.34	<10	-	-	-
Lithium	0.00704	0.00251	0.0141	0.0317	-	-	-
Manganese	0.00321	0.00174	0.00642	0.0196	-	-	-
Phosphorus	0.00964	<0.0063	0.0193	<0.063	-	-	-
Strontium	0.00938	0.00043	0.0188	0.0173	-	-	-
Thallium	0.0014	<0.00096	0.0028	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.973	7.774
Conductivity (µS/cm)	65.60	13.37
Temperature (°C)	20.90	18.00
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.255	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.746
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.3
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215270			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0347 BH4 Sample 2			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	0.00184	<0.00036	0.00368	<0.0036	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00384	0.00205	0.00769	0.0231	-	-	-
Vanadium	<0.00024	<0.00024	<0.00048	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.973	7.774
Conductivity (µS/cm)	65.60	13.37
Temperature (°C)	20.90	18.00
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.255	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.786
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.2
Particle Size <4mm	>95%		

Case	
SDG	130411-7
Lab Sample Number(s)	7215271
Sampled Date	08-Apr-2013
Customer Sample Ref.	SGS 383: 0348 BH4 Sample 3
Depth (m)	0.00

Solid Waste Analysis		**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.0178	0.0153	0.0357	0.157	0.5	2	25
Barium	0.00519	<0.00003	0.0104	0.00845	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	<0.00022	<0.00022	<0.000441	<0.0022	0.5	10	70
Copper	0.00115	<0.00085	0.00229	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00247	0.000424	0.00495	0.00757	0.5	10	30
Nickel	0.00109	<0.00015	0.00218	0.00178	0.4	10	40
Lead	0.00038	0.0016	0.000761	0.0141	0.5	10	50
Antimony	0.00753	0.00148	0.0151	0.0247	0.06	0.7	5
Selenium	0.000899	<0.00039	0.0018	<0.0039	0.1	0.5	7
Zinc	0.00222	<0.00041	0.00444	<0.0041	4	50	200
Chloride	13.6	<2	27.2	22.1	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	41.6	9.06	83.3	144	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.051	7.040
Conductivity (µS/cm)	46.70	6.94
Temperature (°C)	21.00	19.40
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.285	

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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.786
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.2
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215271			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0348 BH4 Sample 3			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.66	6.7	13	67	-	-	-
Aluminium	0.129	0.191	0.258	1.81	-	-	-
Calcium	0.672	0.134	1.35	2.22	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	<0.00001	<0.00001	<0.00002	<0.0001	-	-	-
Sodium	6.66	0.631	13.3	16.1	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.503	<0.036	1.01	0.819	-	-	-
Tungsten	0.00474	<0.0015	0.00949	<0.015	-	-	-
Potassium	3.35	<2.34	6.72	<23.4	-	-	-
Beryllium	0.000293	<0.00007	0.000587	<0.0007	-	-	-
Iron	0.0461	0.046	0.0923	0.46	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.000162	<0.00016	0.000324	<0.0016	-	-	-
Boron	0.019	<0.0094	0.038	<0.094	-	-	-
Cobalt	0.00013	<0.00006	0.00026	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0301	0.011	0.0603	0.141	-	-	-
Manganese	0.00072	0.00217	0.00144	0.0193	-	-	-
Phosphorus	0.0227	<0.0063	0.0455	<0.063	-	-	-
Strontium	0.00549	0.000139	0.011	0.0101	-	-	-
Thallium	0.00132	<0.00096	0.00264	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.051	7.040
Conductivity (µS/cm)	46.70	6.94
Temperature (°C)	21.00	19.40
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.285	

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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.786
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.2
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215271			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0348 BH4 Sample 3			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	0.0021	0.000837	0.00419	0.0104	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00428	0.00171	0.00858	0.0213	-	-	-
Vanadium	<0.00024	0.00027	<0.000481	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.051	7.040
Conductivity (µS/cm)	46.70	6.94
Temperature (°C)	21.00	19.40
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.285	

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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.604
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.4
Particle Size <4mm	>95%		

Case	
SDG	130411-7
Lab Sample Number(s)	7215272
Sampled Date	08-Apr-2013
Customer Sample Ref.	SGS 383: 0349 BH4 Sample 4
Depth (m)	0.00

Solid Waste Analysis		**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.00173	0.00169	0.00346	0.017	0.5	2	25
Barium	0.0162	<0.00003	0.0324	0.0218	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	<0.00022	0.00342	<0.00044	0.0296	0.5	10	70
Copper	0.0149	<0.00085	0.0297	0.02	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.000605	<0.00024	0.00121	<0.0024	0.5	10	30
Nickel	0.000799	0.00216	0.0016	0.0198	0.4	10	40
Lead	0.00549	<0.00002	0.011	0.00737	0.5	10	50
Antimony	0.0018	0.000408	0.0036	0.00595	0.06	0.7	5
Selenium	0.000412	<0.00039	0.000824	<0.0039	0.1	0.5	7
Zinc	0.00614	<0.00041	0.0123	0.00825	4	50	200
Chloride	15.2	2.2	30.4	39.5	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	45.2	9.02	90.4	139	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	5.677	6.801
Conductivity (µS/cm)	50.20	8.42
Temperature (°C)	20.50	17.60
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.235	

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08:59:45 24/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.604
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.4
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215272			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0349 BH4 Sample 4			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	5.59	6.3	11	62	-	-	-
Aluminium	0.0641	0.106	0.128	1	-	-	-
Calcium	0.451	<0.012	0.903	0.606	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	0	<0.00001	0.0000929	<0.0001	-	-	-
Sodium	4.27	0.579	8.54	10.7	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.668	<0.036	1.34	0.897	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	4.8	<2.34	9.59	<23.4	-	-	-
Beryllium	0.000162	<0.00007	0.000324	<0.0007	-	-	-
Iron	0.0231	0.0226	0.0462	0.227	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0112	<0.0094	0.0225	<0.094	-	-	-
Cobalt	0.000503	0.000062	0.00101	0.00121	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0512	0.0154	0.102	0.202	-	-	-
Manganese	0.00681	0.000809	0.0136	0.0161	-	-	-
Phosphorus	0.0137	<0.0063	0.0273	<0.063	-	-	-
Strontium	0.00546	<0.00005	0.0109	0.00733	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	5.677	6.801
Conductivity (µS/cm)	50.20	8.42
Temperature (°C)	20.50	17.60
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.235	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.604
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.4
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215272			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0349 BH4 Sample 4			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	0.000701	<0.00036	0.0014	<0.0036	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.0043	0.00187	0.0086	0.0219	-	-	-
Vanadium	<0.00024	<0.00024	<0.00048	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	5.677	6.801
Conductivity (µS/cm)	50.20	8.42
Temperature (°C)	20.50	17.60
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.235	

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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.442
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215273			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0350 BH4 Sample 5			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.00409	0.00405	0.00817	0.0406	0.5	2	25
Barium	0.00349	<0.00003	0.00698	0.00509	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	<0.00022	0.000225	<0.00044	<0.0022	0.5	10	70
Copper	0.00201	<0.00085	0.00402	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.000244	<0.00024	0.000488	<0.0024	0.5	10	30
Nickel	0.000477	0.000206	0.000953	0.00245	0.4	10	40
Lead	0.000286	0.000382	0.000572	0.00368	0.5	10	50
Antimony	0.000593	0.000589	0.00119	0.0059	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.00078	<0.0039	0.1	0.5	7
Zinc	0.00312	<0.00041	0.00623	0.00455	4	50	200
Chloride	4.6	<2	9.19	<20	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	28.9	10.5	57.8	132	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.246	6.430
Conductivity (µS/cm)	33.10	6.75
Temperature (°C)	20.80	19.90
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.255	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.442
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215273			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0350 BH4 Sample 5			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	5.77	6.6	12	65	-	-	-
Aluminium	0.00977	0.00345	0.0195	0.0437	-	-	-
Calcium	0.507	0.126	1.01	1.82	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	0	<0.00001	0.0000244	<0.0001	-	-	-
Sodium	2.71	<0.076	5.41	3.95	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.386	0.0876	0.771	1.31	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	2.5	<2.34	4.99	<23.4	-	-	-
Beryllium	0.000146	<0.00007	0.000292	<0.0007	-	-	-
Iron	<0.019	<0.019	<0.038	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0239	<0.0094	0.0477	<0.094	-	-	-
Cobalt	0.000541	0.000173	0.00108	0.00227	-	-	-
Sulphate (soluble) as S	1.17	<1	2.33	<10	-	-	-
Lithium	0.0253	0.00936	0.0506	0.117	-	-	-
Manganese	0.0179	0.00776	0.0358	0.0923	-	-	-
Phosphorus	0.012	<0.0063	0.0239	<0.063	-	-	-
Strontium	0.0033	0.000794	0.0066	0.0116	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.246	6.430
Conductivity (µS/cm)	33.10	6.75
Temperature (°C)	20.80	19.90
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.255	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.442
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215273			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0350 BH4 Sample 5			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	<0.00036	0.000443	<0.00072	0.00378	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	<0.00024	<0.00024	<0.00048	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.246	6.430
Conductivity (µS/cm)	33.10	6.75
Temperature (°C)	20.80	19.90
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.255	

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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.381
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215274			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0351 BH4 Sample 6			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.00053	0.000611	0.00106	0.00599	0.5	2	25
Barium	0.00111	<0.00003	0.00222	0.00165	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000232	0.000312	0.000464	0.003	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	<0.00024	<0.00024	<0.00048	<0.0024	0.5	10	30
Nickel	0.000453	<0.00015	0.000905	<0.0015	0.4	10	40
Lead	0.000507	0.000413	0.00101	0.00427	0.5	10	50
Antimony	<0.00016	<0.00016	<0.00032	<0.0016	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	0.000651	<0.00041	0.0013	<0.0041	4	50	200
Chloride	2.7	<2	5.39	<20	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	25.3	7.13	50.6	98.3	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.169	8.161
Conductivity (µS/cm)	25.80	7.74
Temperature (°C)	20.30	19.40
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.260	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.381
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215274			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0351 BH4 Sample 6			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.39	6.5	13	65	-	-	-
Aluminium	0.175	0.0438	0.35	0.633	-	-	-
Calcium	0.0221	<0.012	0.0442	<0.12	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	<0.00001	<0.00001	<0.00002	<0.0001	-	-	-
Sodium	1.41	0.156	2.82	3.42	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.037	<0.036	0.0739	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	4.64	<2.34	9.28	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0555	<0.019	0.111	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0543	0.0185	0.109	0.238	-	-	-
Cobalt	0.000232	<0.00006	0.000464	<0.0006	-	-	-
Sulphate (soluble) as S	1.37	<1	2.73	<10	-	-	-
Lithium	0.0632	0.0211	0.126	0.273	-	-	-
Manganese	0.00516	0.000136	0.0103	0.00882	-	-	-
Phosphorus	0.0121	<0.0063	0.0241	<0.063	-	-	-
Strontium	0.00196	<0.00005	0.00391	0.00291	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.169	8.161
Conductivity (µS/cm)	25.80	7.74
Temperature (°C)	20.30	19.40
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.260	

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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.381
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215274			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0351 BH4 Sample 6			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	<0.00036	<0.00036	<0.000719	<0.0036	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00342	<0.0015	0.00684	<0.015	-	-	-
Vanadium	0.000242	<0.00024	0.000484	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.169	8.161
Conductivity (µS/cm)	25.80	7.74
Temperature (°C)	20.30	19.40
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.260	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.07
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

Case	
SDG	130411-7
Lab Sample Number(s)	7215275
Sampled Date	08-Apr-2013
Customer Sample Ref.	SGS 383: 0352 BH4 Sample 7
Depth (m)	0.00

Solid Waste Analysis		**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.0661	0.0565	0.132	0.579	0.5	2	25
Barium	0.00147	<0.00003	0.00294	0.0021	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.00163	0.00026	0.00325	0.00456	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	0.0000613	<0.00001	0.000123	<0.0001	0.01	0.2	2
Molybdenum	0.000375	0.000291	0.00075	0.00303	0.5	10	30
Nickel	0.00106	<0.00015	0.00211	0.00151	0.4	10	40
Lead	0.000464	0.000797	0.000928	0.00749	0.5	10	50
Antimony	0.000684	0.000349	0.00137	0.00397	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.00078	<0.0039	0.1	0.5	7
Zinc	<0.00041	<0.00041	<0.00082	<0.0041	4	50	200
Chloride	2.3	<2	4.6	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	20.6	15.4	41.2	162	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.808	8.349
Conductivity (µS/cm)	17.26	6.47
Temperature (°C)	20.50	20.50
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.250	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.07
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215275			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0352 BH4 Sample 7			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.55	7.1	13	70	-	-	-
Aluminium	0.319	0.0861	0.638	1.19	-	-	-
Calcium	0.369	2.18	0.739	19.2	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	<0.00001	<0.00001	<0.00002	<0.0001	-	-	-
Sodium	1.03	<0.076	2.06	1.47	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.0929	<0.036	0.186	<0.36	-	-	-
Tungsten	0.00448	<0.0015	0.00897	<0.015	-	-	-
Potassium	2.68	<2.34	5.37	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.14	0.0278	0.279	0.438	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.000176	<0.00016	0.000352	<0.0016	-	-	-
Boron	0.05	0.0118	0.1	0.172	-	-	-
Cobalt	0.000073	<0.00006	0.000146	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0406	0.0146	0.0811	0.183	-	-	-
Manganese	0.00335	0.001	0.0067	0.0134	-	-	-
Phosphorus	<0.0063	<0.0063	<0.0126	<0.063	-	-	-
Strontium	0.00146	0.00473	0.00292	0.0426	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.808	8.349
Conductivity (µS/cm)	17.26	6.47
Temperature (°C)	20.50	20.50
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.250	

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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.07
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215275			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0352 BH4 Sample 7			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	<0.00036	<0.00036	<0.00072	<0.0036	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00922	0.00229	0.0185	0.0328	-	-	-
Vanadium	0.00146	0.00121	0.00293	0.0124	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.808	8.349
Conductivity (µS/cm)	17.26	6.47
Temperature (°C)	20.50	20.50
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.250	

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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.402
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

Case	
SDG	130411-7
Lab Sample Number(s)	7215276
Sampled Date	08-Apr-2013
Customer Sample Ref.	SGS 383: 0353 BH4 Sample 8
Depth (m)	0.00

Solid Waste Analysis		**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.0154	0.0302	0.0307	0.3	0.5	2	25
Barium	0.00926	<0.00003	0.0185	0.00108	20	100	300
Cadmium	0.000196	<0.0001	0.000392	<0.001	0.04	1	5
Chromium	<0.00022	0.000705	<0.00044	0.00697	0.5	10	70
Copper	0.00329	<0.00085	0.00658	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	<0.00024	<0.00024	<0.00048	<0.0024	0.5	10	30
Nickel	0.0017	0.000335	0.00341	0.00351	0.4	10	40
Lead	0.00123	0.000149	0.00245	0.00162	0.5	10	50
Antimony	<0.00016	0.000269	<0.00032	0.00266	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	0.024	<0.00041	0.0479	<0.0041	4	50	200
Chloride	12.7	<2	25.4	<20	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	39.4	7.67	78.7	80.4	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	5.411	6.202
Conductivity (µS/cm)	48.00	6.49
Temperature (°C)	20.40	17.70
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.240	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.402
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215276			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0353 BH4 Sample 8			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	5.81	6.6	12	66	-	-	-
Aluminium	0.0202	0.196	0.0404	1.94	-	-	-
Calcium	0.313	<0.012	0.626	<0.12	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	0.000202	<0.00001	0.000403	<0.0001	-	-	-
Sodium	4.84	0.623	9.66	6.72	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.412	<0.036	0.823	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	3.46	<2.34	6.91	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	<0.019	0.0341	<0.038	0.337	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.00952	<0.0094	0.019	<0.094	-	-	-
Cobalt	0.00144	<0.00006	0.00288	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.035	0.0141	0.0698	0.144	-	-	-
Manganese	0.0142	0.000619	0.0284	0.00777	-	-	-
Phosphorus	0.00933	<0.0063	0.0187	<0.063	-	-	-
Strontium	0.00576	<0.00005	0.0115	0.000672	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	5.411	6.202
Conductivity (µS/cm)	48.00	6.49
Temperature (°C)	20.40	17.70
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.240	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.402
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.6
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215276			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0353 BH4 Sample 8			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	<0.00036	<0.00036	<0.000719	<0.0036	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00315	0.00263	0.00628	0.0264	-	-	-
Vanadium	<0.00024	0.000416	<0.00048	0.00411	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	5.411	6.202
Conductivity (µS/cm)	48.00	6.49
Temperature (°C)	20.40	17.70
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.240	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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24/04/2013 08:59:52

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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.462
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.5
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215278			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0354 BH4 Sample 9			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.0256	0.0222	0.0511	0.227	0.5	2	25
Barium	0.00196	1.66	0.00393	14	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	<0.00022	0.000315	<0.00044	0.00266	0.5	10	70
Copper	0.00274	0.000975	0.00547	0.0125	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00363	0.00218	0.00726	0.0241	0.5	10	30
Nickel	0.0151	0.00093	0.0301	0.0312	0.4	10	40
Lead	0.000028	0.000062	0.000056	0.000568	0.5	10	50
Antimony	0.00305	0.00165	0.00609	0.0187	0.06	0.7	5
Selenium	0.00736	0.000777	0.0147	0.0179	0.1	0.5	7
Zinc	0.0159	0.000602	0.0317	0.0296	4	50	200
Chloride	3.6	6.7	7.2	62.2	800	15000	25000
Fluoride	1.85	1.19	3.69	12.9	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	98.4	31.8	197	421	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	6.993	8.247
Conductivity (µS/cm)	120.60	34.00
Temperature (°C)	21.30	18.80
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.270	

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CERTIFICATE OF ANALYSIS

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Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

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Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130411-7			
Lab Sample Number(s)	7215278			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0354 BH4 Sample 9			
Depth (m)	0.00			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.7	6.5	13	65	-	-	-
Aluminium	0.0285	0.0778	0.057	0.702	-	-	-
Calcium	4.36	<0.012	8.71	6.73	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	<0.00001	<0.00001	<0.00002	<0.0001	-	-	-
Sodium	3	3.54	6	34.5	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	4.46	0.198	8.91	8.56	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	14	4.68	28	61.2	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	<0.019	0.0513	<0.038	0.434	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.00991	<0.0094	0.0198	<0.094	-	-	-
Cobalt	0.00616	0.000364	0.0123	0.0126	-	-	-
Sulphate (soluble) as S	13.3	<1	26.6	20.5	-	-	-
Lithium	0.234	0.0525	0.467	0.805	-	-	-
Manganese	0.0696	0.00445	0.139	0.145	-	-	-
Phosphorus	0.0301	0.0228	0.0601	0.239	-	-	-
Strontium	0.00689	0.000457	0.0138	0.0145	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	6.993	8.247
Conductivity (µS/cm)	120.60	34.00
Temperature (°C)	21.30	18.80
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.270	

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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.462
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.5
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215278			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0354 BH4 Sample 9			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	<0.00036	<0.00036	<0.00072	<0.0036	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00242	0.0022	0.00484	0.0223	-	-	-
Vanadium	0.00068	0.000826	0.00136	0.00803	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	6.993	8.247
Conductivity (µS/cm)	120.60	34.00
Temperature (°C)	21.30	18.80
Volume Leachant (Litres)	0.349	1.400
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CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.311
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case	
SDG	130411-7
Lab Sample Number(s)	7215279
Sampled Date	08-Apr-2013
Customer Sample Ref.	SGS 383: 0355 BH4 Sample 10
Depth (m)	0.00

Solid Waste Analysis		**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.0873	0.0608	0.174	0.652	0.5	2	25
Barium	0.00363	<0.00003	0.00724	0.00602	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000848	0.000609	0.00169	0.00648	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00598	0.00339	0.0119	0.0382	0.5	10	30
Nickel	0.0445	0.00571	0.0888	0.121	0.4	10	40
Lead	0.000279	0.000484	0.000557	0.0045	0.5	10	50
Antimony	0.00383	0.00225	0.00765	0.0251	0.06	0.7	5
Selenium	0.00057	<0.00039	0.00114	<0.0039	0.1	0.5	7
Zinc	0.00854	0.00381	0.0171	0.0459	4	50	200
Chloride	<2	<2	<3.99	<20	800	15000	25000
Fluoride	1.66	0.804	3.31	9.46	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	79.8	32.9	159	407	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.893	7.986
Conductivity (µS/cm)	991.00	17.59
Temperature (°C)	20.30	20.60
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.290	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.311
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130411-7			
Lab Sample Number(s)	7215279			
Sampled Date	08-Apr-2013			
Customer Sample Ref.	SGS 383: 0355 BH4 Sample 10			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.86	7.4	14	73	-	-	-
Aluminium	0.0895	0.148	0.179	1.38	-	-	-
Calcium	5.88	4.82	11.7	50	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Cadmium Ultra low	<0.00001	<0.00001	<0.00002	<0.0001	-	-	-
Sodium	1.83	<0.076	3.65	3.03	-	-	-
Zirconium	<0.002	<0.002	<0.00399	<0.02	-	-	-
Magnesium	3.46	0.618	6.91	10.9	-	-	-
Tungsten	0.00234	<0.0015	0.00467	<0.015	-	-	-
Potassium	9.43	2.86	18.8	39.5	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.03	0.0376	0.0599	0.363	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.00984	<0.0094	0.0196	<0.094	-	-	-
Cobalt	0.012	0.00141	0.024	0.0317	-	-	-
Sulphate (soluble) as S	9.1	<1	18.2	15.1	-	-	-
Lithium	0.134	0.0341	0.268	0.506	-	-	-
Manganese	0.0939	0.0156	0.188	0.286	-	-	-
Phosphorus	<0.0063	<0.0063	<0.0126	<0.063	-	-	-
Strontium	0.00786	0.00606	0.0157	0.0636	-	-	-
Thallium	0.00232	<0.00096	0.00464	<0.0096	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.893	7.986
Conductivity (µS/cm)	991.00	17.59
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Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.290	

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Customer Sample Ref.	SGS 383: 0355 BH4 Sample 10			
Depth (m)	0.00	**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Tin	<0.00036	0.000637	<0.000719	0.00531	-	-	-
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00207	0.00334	0.00413	0.0313	-	-	-
Vanadium	0.000344	0.000701	0.000687	0.00642	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	11-Apr-2013	15-Apr-2013
pH (pH Units)	7.893	7.986
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SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM114		Leaching Procedure for CEN Two Stage BatchTest 2:1/8:1 Cumulative		
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM224	US EPA Method 6010B	Determination of Alkaline Metals by iCap 6500 Duo ICP-OES		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM250		Determination of Silver in Soil by ICP-OES		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM283		Determination of Dissolved Niobium, Tungsten, and Zirconium in Water Matrices by ICP-MS		
TM307		Ultra Low Metals		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	7215269	7215270	7215271	7215272	7215273	7215274	7215275	7215276	7215278	7215279
Customer Sample Ref.	SGS 383: 0346 B H4 Sample 1	SGS 383: 0347 B H4 Sample 2	SGS 383: 0348 B H4 Sample 3	SGS 383: 0349 B H4 Sample 4	SGS 383: 0350 B H4 Sample 5	SGS 383: 0351 B H4 Sample 6	SGS 383: 0352 B H4 Sample 7	SGS 383: 0353 B H4 Sample 8	SGS 383: 0354 B H4 Sample 9	SGS 383: 0355 B H4 Sample 10
AGS Ref.										
Depth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Alkali Metals by iCap-OES (Soil)	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013
Anions by Kone (w)	17-Apr-2013	17-Apr-2013	18-Apr-2013	17-Apr-2013	18-Apr-2013	17-Apr-2013	18-Apr-2013	17-Apr-2013	17-Apr-2013	18-Apr-2013
CEN 2:1 Leachate (2 Stage)	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013
CEN 2:1 Readings	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	18-Apr-2013	18-Apr-2013	17-Apr-2013	17-Apr-2013
CEN 8:1 Leachate (2 Stage)	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	18-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013
CEN 8:1 Readings	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	17-Apr-2013	18-Apr-2013	17-Apr-2013	17-Apr-2013	18-Apr-2013
Dissolved Metals by ICP-MS	18-Apr-2013	18-Apr-2013	19-Apr-2013	18-Apr-2013	19-Apr-2013	18-Apr-2013	19-Apr-2013	18-Apr-2013	19-Apr-2013	19-Apr-2013
Dissolved W, Nb and Zr by ICP-MS	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013
Fluoride	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013
Mercury Dissolved	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013
Metals by iCap-OES Dissolved (W)	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013
Metals in solid samples by OES	24-Apr-2013	24-Apr-2013	24-Apr-2013	24-Apr-2013	24-Apr-2013	24-Apr-2013	24-Apr-2013	24-Apr-2013	24-Apr-2013	24-Apr-2013
Metals Ultra Low	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013
pH Value of Filtered Water	18-Apr-2013	17-Apr-2013	18-Apr-2013	17-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013	18-Apr-2013
Sample description	11-Apr-2013	17-Apr-2013	11-Apr-2013	17-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013
Silver	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013	23-Apr-2013
Total Dissolved Solids	17-Apr-2013	17-Apr-2013	18-Apr-2013	17-Apr-2013	18-Apr-2013	17-Apr-2013	18-Apr-2013	17-Apr-2013	18-Apr-2013	18-Apr-2013

SDG:	130411-7	**Location:**	Leachate Analysis	**Order Number:**	
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221668
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -
Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

ALcontrol Laboratories

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Coffey Geotechnics Limited
9/11 Hornbeam Square South
Hornbeam Park
Harrogate
North Yorkshire
HG2 8NB

Attention: Lesley MacCormack

CERTIFICATE OF ANALYSIS

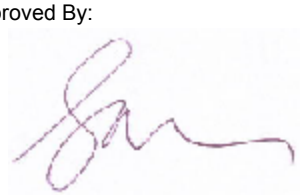
Date:	21 March 2013
Customer:	H_COFFEYGEO_HGT
Sample Delivery Group (SDG):	130311-32
Your Reference:	
Location:	Leachate Analysis
Report No:	216884

We received 10 samples on Monday March 11, 2013 and 10 of these samples were scheduled for analysis which was completed on Thursday March 21, 2013. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
7053569	BH5 SAMPLE 1			08/03/2013
7053571	BH5 SAMPLE 2			08/03/2013
7053572	BH5 SAMPLE 3			08/03/2013
7053574	BH5 SAMPLE 4			08/03/2013
7053575	BH5 SAMPLE 5			08/03/2013
7053577	BH5 SAMPLE 6			08/03/2013
7053578	BH5 SAMPLE 7			08/03/2013
7053580	BH5 SAMPLE 8			08/03/2013
7053581	BH5 SAMPLE 9			08/03/2013
7053582	BH5 SAMPLE 10			08/03/2013

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

SOLID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			7053569	BH5 SAMPLE 1			BAG
			7053571	BH5 SAMPLE 2			BAG
			7053572	BH5 SAMPLE 3			BAG
			7053574	BH5 SAMPLE 4			BAG
			7053575	BH5 SAMPLE 5			BAG
			7053577	BH5 SAMPLE 6			BAG
			7053578	BH5 SAMPLE 7			BAG
			7053580	BH5 SAMPLE 8			BAG
			7053581	BH5 SAMPLE 9			BAG
			7053582	BH5 SAMPLE 10			BAG
Alkali Metals by iCap-OES (Soil)	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
CEN 2:1 Readings	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
CEN 8:1 Readings	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Dissolved W, Nb and Zr by ICP-MS	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Fluoride	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Mercury Dissolved	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Metals by iCap-OES (Soil)	Aluminium	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Antimony	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Arsenic	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Barium	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Beryllium	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Boron	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Cadmium	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X

CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

SOLID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			7053569	BH5 SAMPLE 1			BAG
			7053571	BH5 SAMPLE 2			BAG
			7053572	BH5 SAMPLE 3			BAG
			7053574	BH5 SAMPLE 4			BAG
			7053575	BH5 SAMPLE 5			BAG
			7053577	BH5 SAMPLE 6			BAG
			7053578	BH5 SAMPLE 7			BAG
			7053580	BH5 SAMPLE 8			BAG
			7053581	BH5 SAMPLE 9			BAG
			7053582	BH5 SAMPLE 10			BAG
Metals by iCap-OES (Soil)	Chromium	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Cobalt	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Copper	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Iron	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Lead	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Manganese	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Mercury	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Molybdenum	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Nickel	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Phosphorus	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Selenium	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Strontium	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Thallium	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Tin	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Titanium	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X

CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

SOLID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			7053569	BH5 SAMPLE 1			BAG
			7053571	BH5 SAMPLE 2			BAG
			7053572	BH5 SAMPLE 3			BAG
			7053574	BH5 SAMPLE 4			BAG
			7053575	BH5 SAMPLE 5			BAG
			7053577	BH5 SAMPLE 6			BAG
			7053578	BH5 SAMPLE 7			BAG
			7053580	BH5 SAMPLE 8			BAG
			7053581	BH5 SAMPLE 9			BAG
			7053582	BH5 SAMPLE 10			BAG
Metals by iCap-OES (Soil)	Vanadium	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
	Zinc	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
pH Value of Filtered Water	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Sample description	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Silver	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Total Dissolved Solids	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X

CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
7053569	BH5 SAMPLE 1		Light Brown	Loamy Sand	2 - 10 mm	Stones	N/A
7053571	BH5 SAMPLE 2		Grey	Sand	2 - 10 mm	Stones	None
7053572	BH5 SAMPLE 3		Grey	Sand	2 - 10 mm	Stones	None
7053574	BH5 SAMPLE 4		Light Brown	Loamy Sand	2 - 10 mm	Stones	N/A
7053575	BH5 SAMPLE 5		Light Brown	Loamy Sand	2 - 10 mm	Stones	N/A
7053577	BH5 SAMPLE 6		Grey	Sand	2 - 10 mm	Stones	None
7053578	BH5 SAMPLE 7		Grey	Sand	2 - 10 mm	Stones	None
7053580	BH5 SAMPLE 8		Light Brown	Loamy Sand	2 - 10 mm	Stones	N/A
7053581	BH5 SAMPLE 9		Grey	Sand	2 - 10 mm	Stones	None
7053582	BH5 SAMPLE 10		Light Brown	Loamy Sand	2 - 10 mm	Stones	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH5 SAMPLE 1	BH5 SAMPLE 2	BH5 SAMPLE 3	BH5 SAMPLE 4	BH5 SAMPLE 5	BH5 SAMPLE 6
			Depth (m)	.	.	.	.	.	.
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	08/03/2013	08/03/2013	08/03/2013	08/03/2013	08/03/2013	08/03/2013
			Sample Time	.	.	.	.	.	.
			Date Received	11/03/2013	11/03/2013	11/03/2013	11/03/2013	11/03/2013	11/03/2013
			SDG Ref	130311-32	130311-32	130311-32	130311-32	130311-32	130311-32
			Lab Sample No.(s)	7053569	7053571	7053572	7053574	7053575	7053577
			AGS Reference						
Aluminium	<11 mg/kg	TM181		886	25000	28000	8090	21500	21500
Antimony	<0.6 mg/kg	TM181		3.55 #	<6 #	<6 #	3.4 #	1.37 #	18.3 #
Arsenic	<0.6 mg/kg	TM181		139 M	261 M	52.4 M	340 M	66.5 M	449 M
Barium	<0.6 mg/kg	TM181		10 #	94.5 #	139 #	56.1 #	112 #	87.7 #
Beryllium	<0.01 mg/kg	TM181		0.292 M	2.19 M	1.58 M	1.42 M	0.585 M	25.8 M
Boron	<0.7 mg/kg	TM181		49.5 #	<7 #	<7 #	17.1 #	3.74 #	28.2 #
Cadmium	<0.02 mg/kg	TM181		<0.02 M	<0.2 M	<0.2 M	0.128 M	0.275 M	<0.2 M
Chromium	<0.9 mg/kg	TM181		2.98 M	46.5 M	49.1 M	15.3 M	32.7 M	386 M
Cobalt	<0.1 mg/kg	TM181		1.34 M	7.76 M	6.23 M	3.29 M	6.44 M	72.7 M
Copper	<1.4 mg/kg	TM181		38.5 M	136 M	31.3 M	56 M	25.5 M	123 M
Iron	<1000 mg/kg	TM181		5290 #	28400 #	41000 #	38900 #	31300 #	50500 #
Lead	<0.7 mg/kg	TM181		13.6 M	14.5 M	<7 M	3.89 M	11.4 M	54.8 M
Manganese	<0.13 mg/kg	TM181		20.6 M	271 M	523 M	134 M	530 M	487 M
Mercury	<0.14 mg/kg	TM181		<0.14 M	<1.4 M	<1.4 M	<0.14 M	<0.14 M	<1.4 M
Molybdenum	<0.1 mg/kg	TM181		0.62 #	2.86 #	<1 #	1.64 #	0.443 #	18.6 #
Nickel	<0.2 mg/kg	TM181		6.76 M	21.6 M	29 M	25.2 M	23.2 M	411 M
Phosphorus	<1 mg/kg	TM181		65.3	334	163	298	138	382
Selenium	<1 mg/kg	TM181		1.01 #	<10 #	<10 #	<1 #	<1 #	<10 #
Strontium	<0.4 mg/kg	TM181		2.04 #	29 #	14.8 #	4.44 #	8.98 #	66.4 #
Tin	<0.24 mg/kg	TM181		1.24 #	11.3 #	14.5 #	10.7 #	20.8 #	104 #
Thallium	<0.7 mg/kg	TM181		<0.7 #	<7 #	<7 #	<0.7 #	<0.7 #	11.7 #
Titanium	<0.1 mg/kg	TM181		66.4	981	1800	697	1860	2200
Vanadium	<0.2 mg/kg	TM181		1.75 #	46.2 #	51.5 #	17.5 #	30.5 #	511 #
Zinc	<1.9 mg/kg	TM181		14.2 M	30.4 M	31.2 M	25.6 M	40.3 M	52.6 M
Calcium	<21 mg/kg	TM224		367	174	23.4	121	205	57.1
Sodium	<7 mg/kg	TM224		30.6	57.3	104	42.1	80.6	74.1
Magnesium	<8 mg/kg	TM224		166	4580	7830	2010	6420	8420
Potassium	<16 mg/kg	TM224		213	10200	18300	6080	15900	18300
Silver	<10 mg/kg	TM250		<10	<10	<10	<10	<10	<10

CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH5 SAMPLE 7	BH5 SAMPLE 8	BH5 SAMPLE 9	BH5 SAMPLE 10		
			Depth (m)	.	.	.	.		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	08/03/2013	08/03/2013	08/03/2013	08/03/2013		
			Sample Time	.	.	.	.		
			Date Received	11/03/2013	11/03/2013	11/03/2013	11/03/2013		
			SDG Ref	130311-32	130311-32	130311-32	130311-32		
			Lab Sample No.(s)	7053578	7053580	7053581	7053582		
			AGS Reference						
Aluminium	<11 mg/kg	TM181		10200	19700	23600	52000		
Antimony	<0.6 mg/kg	TM181		1.31 #	1.65 #	<6 #	1.92 #		
Arsenic	<0.6 mg/kg	TM181		49.3 M	48 M	32.8 M	60.8 M		
Barium	<0.6 mg/kg	TM181		114 #	70.5 #	210 #	159 #		
Beryllium	<0.01 mg/kg	TM181		1.15 M	0.987 M	1.44 M	5.64 M		
Boron	<0.7 mg/kg	TM181		2.75 #	2.07 #	<7 #	10.3 #		
Cadmium	<0.02 mg/kg	TM181		0.17 M	0.132 M	<0.2 M	0.173 M		
Chromium	<0.9 mg/kg	TM181		59.3 M	43 M	39.2 M	170 M		
Cobalt	<0.1 mg/kg	TM181		11.5 M	7.51 M	5.44 M	16.8 M		
Copper	<1.4 mg/kg	TM181		68.3 M	93.7 M	20.9 M	304 M		
Iron	<1000 mg/kg	TM181		40300 #	22400 #	35800 #	48900 #		
Lead	<0.7 mg/kg	TM181		6.37 M	4.73 M	7.79 M	5.51 M		
Manganese	<0.13 mg/kg	TM181		525 M	318 M	568 M	608 M		
Mercury	<0.14 mg/kg	TM181		<0.14 M	<0.14 M	<1.4 M	<0.14 M		
Molybdenum	<0.1 mg/kg	TM181		<0.1 #	0.236 #	<1 #	0.294 #		
Nickel	<0.2 mg/kg	TM181		37 M	21.1 M	24.3 M	107 M		
Phosphorus	<1 mg/kg	TM181		127	145	95.7	2850		
Selenium	<1 mg/kg	TM181		<1 #	<1 #	<10 #	<1 #		
Strontium	<0.4 mg/kg	TM181		3.78 #	5.14 #	5.56 #	16.2 #		
Tin	<0.24 mg/kg	TM181		4.32 #	2.93 #	24.9 #	9.97 #		
Thallium	<0.7 mg/kg	TM181		<0.7 #	<0.7 #	<7 #	<0.7 #		
Titanium	<0.1 mg/kg	TM181		555	4000	1930	2110		
Vanadium	<0.2 mg/kg	TM181		58.1 #	38.8 #	44.1 #	181 #		
Zinc	<1.9 mg/kg	TM181		71.2 M	41.2 M	67 M	213 M		
Calcium	<21 mg/kg	TM224		262	54.6	51.7	5350		
Sodium	<7 mg/kg	TM224		211	79.2	107	255		
Magnesium	<8 mg/kg	TM224		11800	5290	8530	60000		
Potassium	<16 mg/kg	TM224		18800	10100	19000	52500		
Silver	<10 mg/kg	TM250		<10	<10	<10	<10		

CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.241
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130311-32			
Lab Sample Number(s)	7053569			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 1			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.00388	0.0116	0.00777	0.104	0.5	2	25
Barium	0.00411	0.00117	0.00823	0.0161	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000453	0.00033	0.000907	0.00349	0.5	10	70
Copper	0.00201	<0.00085	0.00403	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00385	0.000861	0.00771	0.0131	0.5	10	30
Nickel	0.00105	<0.00015	0.0021	0.00159	0.4	10	40
Lead	0.000517	0.0013	0.00104	0.0118	0.5	10	50
Antimony	0.00142	0.00055	0.00285	0.00682	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000781	<0.0039	0.1	0.5	7
Zinc	0.0013	<0.00041	0.0026	<0.0041	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	51.9	22.1	104	266	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.771	7.919
Conductivity (µS/cm)	52.10	19.95
Temperature (°C)	20.00	20.10
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.265	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
21/03/2013 17:07:01

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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.241
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053569			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 1			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Conc^n in 2:1 eluate	C_8 Conc^n in 8:1 eluate	A_2 2:1 conc^n leached	$A_{2\text{-}10}$ Cumulative conc^n leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	7.38	7.2	15	72	-	-	-
Aluminium	0.316	0.757	0.633	6.91	-	-	-
Calcium	8.72	3.94	17.5	46.6	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	0.266	<0.076	0.532	<0.76	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.684	0.136	1.37	2.19	-	-	-
Tungsten	0.0362	0.018	0.0725	0.208	-	-	-
Potassium	<2.34	<2.34	<4.69	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0566	0.128	0.113	1.17	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.465	0.186	0.931	2.28	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.00859	0.00285	0.0172	0.0372	-	-	-
Manganese	0.00591	0.0019	0.0118	0.0251	-	-	-
Phosphorus	0.00783	0.0115	0.0157	0.11	-	-	-
Strontium	0.0224	0.00474	0.0449	0.0741	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	0.000724	<0.00036	0.00145	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.771	7.919
Conductivity (µS/cm)	52.10	19.95
Temperature (°C)	20.00	20.10
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.265	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.241
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130311-32			
Lab Sample Number(s)	7053569			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 1			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00322	0.00541	0.00644	0.0508	-	-	-
Vanadium	0.00032	0.001	0.000641	0.009	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.771	7.919
Conductivity (µS/cm)	52.10	19.95
Temperature (°C)	20.00	20.10
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.265	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.181	**Moisture Content Ratio (%)**	3.37
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	96.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130311-32			
Lab Sample Number(s)	7053571			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 2			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0112	0.00616	0.0225	0.0698	0.5	2	25
Barium	0.00256	0.000189	0.00512	0.00575	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	<0.00022	<0.00022	<0.00044	<0.0022	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.000381	0.000271	0.000762	0.00289	0.5	10	30
Nickel	0.000209	<0.00015	0.000418	<0.0015	0.4	10	40
Lead	0.00138	<0.00002	0.00277	0.00225	0.5	10	50
Antimony	0.00128	0.000423	0.00256	0.00563	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.00078	<0.0039	0.1	0.5	7
Zinc	0.0055	<0.00041	0.011	0.00896	4	50	200
Chloride	2	<2	4	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	21.7	7.66	43.4	99.5	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	6.757	7.109
Conductivity (µS/cm)	24.60	5.04
Temperature (°C)	20.00	20.10
Volume Leachant (Litres)	0.344	1.400
Volume of Eluate VE1 (Litres)	0.285	

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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.181	**Moisture Content Ratio (%)**	3.37
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	96.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053571			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 2			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.73	6.5	13	66	-	-	-
Aluminium	0.00744	0.0106	0.0149	0.101	-	-	-
Calcium	0.413	<0.012	0.825	0.673	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	1.03	<0.076	2.05	1.68	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.282	0.0361	0.564	0.761	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	<2.34	<2.34	<4.68	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	<0.019	<0.019	<0.038	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0465	0.0117	0.0931	0.174	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.00264	<0.00192	0.00527	<0.0192	-	-	-
Manganese	0.00457	0.00286	0.00913	0.0313	-	-	-
Phosphorus	0.0142	<0.0063	0.0283	<0.063	-	-	-
Strontium	0.00797	0.000482	0.0159	0.017	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.00072	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	6.757	7.109
Conductivity (µS/cm)	24.60	5.04
Temperature (°C)	20.00	20.10
Volume Leachant (Litres)	0.344	1.400
Volume of Eluate VE1 (Litres)	0.285	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.181	**Moisture Content Ratio (%)**	3.37
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	96.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053571			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 2			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	<0.00024	<0.00024	<0.00048	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	6.757	7.109
Conductivity (µS/cm)	24.60	5.04
Temperature (°C)	20.00	20.10
Volume Leachant (Litres)	0.344	1.400
Volume of Eluate VE1 (Litres)	0.285	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	1.75
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98.3
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053572			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 3			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.00423	0.00187	0.00846	0.0226	0.5	2	25
Barium	0.000956	0.000372	0.00191	0.00469	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	<0.00022	<0.00022	<0.00044	<0.0022	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	<0.00024	<0.00024	<0.00048	<0.0024	0.5	10	30
Nickel	0.000225	<0.00015	0.00045	<0.0015	0.4	10	40
Lead	0.000297	<0.00002	0.000594	0.000492	0.5	10	50
Antimony	0.000428	0.000164	0.000856	0.00208	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.00078	<0.0039	0.1	0.5	7
Zinc	0.0261	<0.00041	0.0523	0.0433	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	31.4	19.1	62.8	212	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.498	7.113
Conductivity (µS/cm)	18.73	4.13
Temperature (°C)	20.10	20.10
Volume Leachant (Litres)	0.347	1.400
Volume of Eluate VE1 (Litres)	0.290	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	1.75
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98.3
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130311-32			
Lab Sample Number(s)	7053572			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 3			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.79	6.8	14	68	-	-	-
Aluminium	0.0612	0.0513	0.122	0.529	-	-	-
Calcium	0.594	<0.012	1.19	0.984	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	0.392	<0.076	0.784	<0.76	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.15	<0.036	0.299	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	<2.34	<2.34	<4.68	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0272	<0.019	0.0544	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0473	0.0122	0.0947	0.18	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0119	0.00433	0.0237	0.0559	-	-	-
Manganese	0.00297	0.000223	0.00594	0.00678	-	-	-
Phosphorus	0.0311	<0.0063	0.0622	<0.063	-	-	-
Strontium	0.0037	0.000535	0.0074	0.0106	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.00072	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.498	7.113
Conductivity (µS/cm)	18.73	4.13
Temperature (°C)	20.10	20.10
Volume Leachant (Litres)	0.347	1.400
Volume of Eluate VE1 (Litres)	0.290	

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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	1.75
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98.3
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053572			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 3			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00232	<0.0015	0.00463	<0.015	-	-	-
Vanadium	0.00027	<0.00024	0.00054	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.498	7.113
Conductivity (µS/cm)	18.73	4.13
Temperature (°C)	20.10	20.10
Volume Leachant (Litres)	0.347	1.400
Volume of Eluate VE1 (Litres)	0.290	

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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.261
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130311-32			
Lab Sample Number(s)	7053574			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 4			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.00538	0.00231	0.0108	0.0284	0.5	2	25
Barium	0.00425	0.000573	0.00851	0.0121	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000358	<0.00022	0.000717	<0.0022	0.5	10	70
Copper	0.00163	<0.00085	0.00327	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00303	0.000804	0.00606	0.0119	0.5	10	30
Nickel	0.000371	<0.00015	0.000743	<0.0015	0.4	10	40
Lead	0.00214	0.000334	0.00428	0.00649	0.5	10	50
Antimony	0.000561	<0.00016	0.00112	<0.0016	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000781	<0.0039	0.1	0.5	7
Zinc	0.00658	<0.00041	0.0132	0.0115	4	50	200
Chloride	<2	<2	<4.01	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	40.8	5.78	81.7	119	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	8.509	8.751
Conductivity (µS/cm)	34.40	4.51
Temperature (°C)	20.10	19.90
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.305	

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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.261
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053574			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 4			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Conc^n in 2:1 eluate	C_8 Conc^n in 8:1 eluate	A_2 2:1 conc^n leached	$A_{2\text{-}10}$ Cumulative conc^n leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	7.1	6.5	14	66	-	-	-
Aluminium	0.103	0.0338	0.206	0.459	-	-	-
Calcium	2.59	<0.012	5.18	4.51	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	0.114	<0.076	0.228	<0.76	-	-	-
Zirconium	<0.002	<0.002	<0.00401	<0.02	-	-	-
Magnesium	0.331	<0.036	0.663	0.577	-	-	-
Tungsten	0.00594	0.00183	0.0119	0.0255	-	-	-
Potassium	3.55	<2.34	7.11	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.109	<0.019	0.219	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.163	0.0242	0.326	0.484	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0149	<0.00192	0.0297	0.026	-	-	-
Manganese	0.0058	0.00137	0.0116	0.0214	-	-	-
Phosphorus	0.0233	<0.0063	0.0467	<0.063	-	-	-
Strontium	0.00866	0.000297	0.0173	0.0175	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.000721	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	8.509	8.751
Conductivity (µS/cm)	34.40	4.51
Temperature (°C)	20.10	19.90
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.305	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.261
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130311-32			
Lab Sample Number(s)	7053574			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 4			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00407	<0.0015	0.00814	<0.015	-	-	-
Vanadium	0.000505	<0.00024	0.00101	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	8.509	8.751
Conductivity (µS/cm)	34.40	4.51
Temperature (°C)	20.10	19.90
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.305	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.573
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.4
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130311-32			
Lab Sample Number(s)	7053575			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 5			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.00502	0.0103	0.01	0.0945	0.5	2	25
Barium	0.0174	0.000805	0.0349	0.0341	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000603	0.000279	0.00121	0.0033	0.5	10	70
Copper	0.00112	<0.00085	0.00224	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.005	0.00168	0.01	0.022	0.5	10	30
Nickel	0.000251	<0.00015	0.000502	<0.0015	0.4	10	40
Lead	0.000226	0.000109	0.000452	0.00127	0.5	10	50
Antimony	0.00144	0.000442	0.00288	0.00599	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.00078	<0.0039	0.1	0.5	7
Zinc	0.00124	<0.00041	0.00247	<0.0041	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	74.5	16.4	149	255	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	8.213	7.430
Conductivity (µS/cm)	84.60	15.15
Temperature (°C)	19.90	19.90
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.275	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.573
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.4
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130311-32			
Lab Sample Number(s)	7053575			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 5			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.57	7.2	15	72	-	-	-
Aluminium	0.0303	0.151	0.0606	1.32	-	-	-
Calcium	8.66	0.649	17.3	19.1	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	0.509	<0.076	1.02	0.8	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	1.03	0.0942	2.07	2.41	-	-	-
Tungsten	0.00427	0.0031	0.00854	0.0328	-	-	-
Potassium	10.9	2.61	21.9	39.2	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0208	0.0584	0.0416	0.525	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0681	0.015	0.136	0.234	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.00251	<0.00192	0.00502	<0.0192	-	-	-
Manganese	0.0166	0.00248	0.0331	0.047	-	-	-
Phosphorus	0.0384	<0.0063	0.0768	<0.063	-	-	-
Strontium	0.0291	0.00207	0.0581	0.0632	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.00072	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	8.213	7.430
Conductivity (µS/cm)	84.60	15.15
Temperature (°C)	19.90	19.90
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.275	

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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.573
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.4
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130311-32			
Lab Sample Number(s)	7053575			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 5			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00153	0.00354	0.00305	0.0322	-	-	-
Vanadium	0.000453	0.000621	0.000906	0.00595	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	8.213	7.430
Conductivity (µS/cm)	84.60	15.15
Temperature (°C)	19.90	19.90
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.275	

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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.929
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.1
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130311-32			
Lab Sample Number(s)	7053577			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 6			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.00556	0.00299	0.0111	0.0339	0.5	2	25
Barium	0.00134	0.00192	0.00268	0.0183	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	<0.00022	<0.00022	<0.00044	<0.0022	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.000624	0.00035	0.00125	0.00393	0.5	10	30
Nickel	<0.00015	<0.00015	<0.0003	<0.0015	0.4	10	40
Lead	0.000023	<0.00002	0.000046	<0.0002	0.5	10	50
Antimony	0.00106	0.000372	0.00211	0.0048	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	0.000514	<0.00041	0.00103	<0.0041	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	16.9	10.1	33.7	112	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.966	7.414
Conductivity (µS/cm)	19.43	3.41
Temperature (°C)	19.70	20.10
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.275	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.929
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.1
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130311-32			
Lab Sample Number(s)	7053577			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 6			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.64	6.6	13	66	-	-	-
Aluminium	0.0303	0.022	0.0606	0.233	-	-	-
Calcium	<0.012	<0.012	<0.024	<0.12	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	0.723	<0.076	1.44	1.14	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.141	<0.036	0.282	<0.36	-	-	-
Tungsten	0.00154	0.00171	0.00307	0.0168	-	-	-
Potassium	<2.34	<2.34	<4.67	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0198	<0.019	0.0396	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0241	<0.0094	0.0481	<0.094	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.00267	<0.00192	0.00534	<0.0192	-	-	-
Manganese	0.00125	0.00021	0.0025	0.00373	-	-	-
Phosphorus	0.0213	0.00713	0.0426	0.0936	-	-	-
Strontium	0.00366	0.000666	0.0073	0.0114	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	0.000368	<0.00036	0.000735	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.966	7.414
Conductivity (µS/cm)	19.43	3.41
Temperature (°C)	19.70	20.10
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.275	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.929
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.1
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053577			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 6			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	<0.00024	<0.00024	<0.00048	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.966	7.414
Conductivity (µS/cm)	19.43	3.41
Temperature (°C)	19.70	20.10
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.275	

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Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.180	**Moisture Content Ratio (%)**	2.66
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	97.4
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053578			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 7			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.00331	0.0013	0.00661	0.0161	0.5	2	25
Barium	0.00388	0.00026	0.00775	0.00818	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	<0.00022	<0.00022	<0.00044	<0.0022	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	<0.00024	<0.00024	<0.00048	<0.0024	0.5	10	30
Nickel	<0.00015	<0.00015	<0.0003	<0.0015	0.4	10	40
Lead	0.000795	<0.00002	0.00159	0.00123	0.5	10	50
Antimony	0.000402	<0.00016	0.000803	<0.0016	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	0.00219	0.000568	0.00438	0.00818	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	28.3	5.35	56.5	88.9	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.184	6.196
Conductivity (µS/cm)	21.70	3.33
Temperature (°C)	20.10	20.20
Volume Leachant (Litres)	0.345	1.400
Volume of Eluate VE1 (Litres)	0.270	

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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.180	**Moisture Content Ratio (%)**	2.66
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	97.4
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053578			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 7			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.71	6.4	13	65	-	-	-
Aluminium	0.0124	0.0194	0.0248	0.183	-	-	-
Calcium	1.31	<0.012	2.62	2.02	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	0.537	<0.076	1.07	0.829	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.126	<0.036	0.252	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	<2.34	<2.34	<4.68	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	<0.019	<0.019	<0.038	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0141	<0.0094	0.0281	<0.094	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0171	0.00455	0.0341	0.0649	-	-	-
Manganese	0.00565	0.00398	0.0113	0.0423	-	-	-
Phosphorus	0.0168	0.055	0.0335	0.491	-	-	-
Strontium	0.00915	0.00062	0.0183	0.0194	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.000719	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.184	6.196
Conductivity (µS/cm)	21.70	3.33
Temperature (°C)	20.10	20.20
Volume Leachant (Litres)	0.345	1.400
Volume of Eluate VE1 (Litres)	0.270	

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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.180	**Moisture Content Ratio (%)**	2.66
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	97.4
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053578			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 7			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	<0.00024	<0.00024	<0.00048	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.184	6.196
Conductivity (µS/cm)	21.70	3.33
Temperature (°C)	20.10	20.20
Volume Leachant (Litres)	0.345	1.400
Volume of Eluate VE1 (Litres)	0.270	

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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.180	**Moisture Content Ratio (%)**	3.07
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	97
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053580			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 8			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.00515	0.00197	0.0103	0.0248	0.5	2	25
Barium	0.00366	0.000159	0.00733	0.00719	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000226	<0.00022	0.000453	<0.0022	0.5	10	70
Copper	0.00132	<0.00085	0.00264	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	<0.00024	<0.00024	<0.000481	<0.0024	0.5	10	30
Nickel	0.000171	<0.00015	0.000342	<0.0015	0.4	10	40
Lead	0.00569	<0.00002	0.0114	0.0091	0.5	10	50
Antimony	0.000217	0.000246	0.000435	0.00241	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000781	<0.0039	0.1	0.5	7
Zinc	0.00943	0.00118	0.0189	0.025	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	46.3	6.06	92.7	125	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.962	7.753
Conductivity (µS/cm)	41.60	3.89
Temperature (°C)	19.90	19.90
Volume Leachant (Litres)	0.345	1.400
Volume of Eluate VE1 (Litres)	0.280	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.180	**Moisture Content Ratio (%)**	3.07
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	97
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053580			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 8			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	7.2	6.2	14	64	-	-	-
Aluminium	0.0284	0.0154	0.0568	0.175	-	-	-
Calcium	5.37	<0.012	10.7	8.59	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	0.919	<0.076	1.84	1.47	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.157	<0.036	0.314	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	<2.34	<2.34	<4.68	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	<0.019	<0.019	<0.038	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0316	0.0136	0.0632	0.164	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.00813	0.00246	0.0163	0.0337	-	-	-
Manganese	0.00253	0.000668	0.00506	0.00966	-	-	-
Phosphorus	0.0205	0.0111	0.041	0.126	-	-	-
Strontium	0.00909	0.000216	0.0182	0.0164	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.000721	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.962	7.753
Conductivity (µS/cm)	41.60	3.89
Temperature (°C)	19.90	19.90
Volume Leachant (Litres)	0.345	1.400
Volume of Eluate VE1 (Litres)	0.280	

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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.180	**Moisture Content Ratio (%)**	3.07
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	97
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053580			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 8			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	<0.00024	<0.00024	<0.000481	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.962	7.753
Conductivity (µS/cm)	41.60	3.89
Temperature (°C)	19.90	19.90
Volume Leachant (Litres)	0.345	1.400
Volume of Eluate VE1 (Litres)	0.280	

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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.898
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.1
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053581			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 9			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.00354	0.00223	0.00707	0.0244	0.5	2	25
Barium	0.00358	0.000427	0.00714	0.00922	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000222	<0.00022	0.000444	<0.0022	0.5	10	70
Copper	0.00126	<0.00085	0.00251	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.0015	0.000552	0.003	0.00701	0.5	10	30
Nickel	0.000175	<0.00015	0.00035	<0.0015	0.4	10	40
Lead	0.00234	<0.00002	0.00468	0.00368	0.5	10	50
Antimony	0.00226	0.000228	0.00452	0.00547	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	0.00533	<0.00041	0.0106	0.00838	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	25.2	15	50.3	166	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.269	6.714
Conductivity (µS/cm)	26.30	4.55
Temperature (°C)	19.90	20.10
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.275	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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21/03/2013 17:07:01

17:05:45 21/03/2013

CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.898
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.1
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130311-32			
Lab Sample Number(s)	7053581			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 9			
Depth (m)				
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.88	6.8	14	68	-	-	-
Aluminium	0.0617	0.0591	0.123	0.595	-	-	-
Calcium	0.676	<0.012	1.35	1.06	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	0.421	<0.076	0.842	<0.76	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.168	<0.036	0.336	<0.36	-	-	-
Tungsten	0.00281	<0.0015	0.00561	<0.015	-	-	-
Potassium	2.93	<2.34	5.86	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0233	<0.019	0.0465	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0638	0.0149	0.127	0.226	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.00479	<0.00192	0.00957	<0.0192	-	-	-
Manganese	0.00101	0.000059	0.00201	0.00208	-	-	-
Phosphorus	0.0317	<0.0063	0.0632	<0.063	-	-	-
Strontium	0.00464	0.000121	0.00928	0.00831	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	0.000811	<0.00036	0.00162	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.269	6.714
Conductivity (µS/cm)	26.30	4.55
Temperature (°C)	19.90	20.10
Volume Leachant (Litres)	0.348	1.400
Volume of Eluate VE1 (Litres)	0.275	

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17:05:45 21/03/2013

CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

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REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.177	**Moisture Content Ratio (%)**	0.898
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.1
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053581			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 9			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00196	0.00162	0.00392	0.0167	-	-	-
Vanadium	0.000347	0.000299	0.000693	0.00306	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	7.269	6.714
Conductivity (µS/cm)	26.30	4.55
Temperature (°C)	19.90	20.10
Volume Leachant (Litres)	0.348	1.400
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Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.182	**Moisture Content Ratio (%)**	3.94
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	96.2
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053582			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 10			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.0633	0.036	0.127	0.405	0.5	2	25
Barium	0.0023	0.000142	0.00459	0.005	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000269	<0.00022	0.000538	<0.0022	0.5	10	70
Copper	0.0023	<0.00085	0.0046	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00224	0.000942	0.00448	0.0116	0.5	10	30
Nickel	0.00065	<0.00015	0.0013	<0.0015	0.4	10	40
Lead	0.000057	<0.00002	0.000114	<0.0002	0.5	10	50
Antimony	0.000604	0.000185	0.00121	0.00254	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.00078	<0.0039	0.1	0.5	7
Zinc	0.00349	<0.00041	0.00697	0.00578	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	31.8	8.12	63.6	120	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	8.304	8.026
Conductivity (µS/cm)	17.23	6.49
Temperature (°C)	19.90	20.00
Volume Leachant (Litres)	0.343	1.400
Volume of Eluate VE1 (Litres)	0.290	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.182	**Moisture Content Ratio (%)**	3.94
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	96.2
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053582			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 10			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
pH Value of Filtered Water	6.67	6.6	13	66	-	-	-
Aluminium	0.104	0.0889	0.208	0.914	-	-	-
Calcium	<0.012	<0.012	<0.024	<0.12	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	1.28	<0.076	2.57	2.12	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.14	<0.036	0.279	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	<2.34	<2.34	<4.68	<23.4	-	-	-
Beryllium	<0.00007	0.000167	<0.00014	0.00139	-	-	-
Iron	0.0335	<0.019	0.067	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0119	<0.0094	0.0239	<0.094	-	-	-
Cobalt	0.000063	<0.00006	0.000126	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0199	0.00989	0.0398	0.116	-	-	-
Manganese	0.00164	<0.00004	0.00328	0.00272	-	-	-
Phosphorus	0.61	0.429	1.22	4.59	-	-	-
Strontium	0.0023	0.00011	0.00459	0.00473	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.00072	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	8.304	8.026
Conductivity (µS/cm)	17.23	6.49
Temperature (°C)	19.90	20.00
Volume Leachant (Litres)	0.343	1.400
Volume of Eluate VE1 (Litres)	0.290	

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CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.182	**Moisture Content Ratio (%)**	3.94
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	96.2
Particle Size <4mm	>95%		

Case		**Landfill Waste Acceptance Criteria Limits**		
SDG	130311-32			
Lab Sample Number(s)	7053582			
Sampled Date	08-Mar-2013			
Customer Sample Ref.	BH5 SAMPLE 10			
Depth (m)		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Solid Waste Analysis				
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00423	0.00221	0.00846	0.0255	-	-	-
Vanadium	0.0229	0.0177	0.0458	0.186	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	13-Mar-2013	14-Mar-2013
pH (pH Units)	8.304	8.026
Conductivity (µS/cm)	17.23	6.49
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Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM114		Leaching Procedure for CEN Two Stage BatchTest 2:1/8:1 Cumulative		
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM224	US EPA Method 6010B	Determination of Alkaline Metals by iCap 6500 Duo ICP-OES		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM250		Determination of Silver in Soil by ICP-OES		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM283		Determination of Dissolved Niobium, Tungsten, and Zirconium in Water Matrices by ICP-MS		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	7053569	7053571	7053572	7053574	7053575	7053577	7053578	7053580	7053581	7053582
Customer Sample Ref.	BH5 SAMPLE 1	BH5 SAMPLE 2	BH5 SAMPLE 3	BH5 SAMPLE 4	BH5 SAMPLE 5	BH5 SAMPLE 6	BH5 SAMPLE 7	BH5 SAMPLE 8	BH5 SAMPLE 9	BH5 SAMPLE 10
AGS Ref.										
Depth										
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Alkali Metals by iCap-OES (Soil)	21-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013	20-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013
Anions by Kone (w)	20-Mar-2013	20-Mar-2013	20-Mar-2013	20-Mar-2013	20-Mar-2013	20-Mar-2013	20-Mar-2013	20-Mar-2013	20-Mar-2013	20-Mar-2013
CEN 2:1 Leachate (2 Stage)	13-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013
CEN 2:1 Readings	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013
CEN 8:1 Leachate (2 Stage)	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013
CEN 8:1 Readings	18-Mar-2013	18-Mar-2013	18-Mar-2013	18-Mar-2013	18-Mar-2013	18-Mar-2013	18-Mar-2013	18-Mar-2013	18-Mar-2013	18-Mar-2013
Dissolved Metals by ICP-MS	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013
Dissolved W, Nb and Zr by ICP-MS	21-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013
Fluoride	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013
Mercury Dissolved	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013
Metals by iCap-OES	20-Mar-2013	21-Mar-2013	21-Mar-2013	20-Mar-2013	20-Mar-2013	21-Mar-2013	20-Mar-2013	20-Mar-2013	21-Mar-2013	20-Mar-2013
Metals by iCap-OES Dissolved (W)	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013	19-Mar-2013
pH Value of Filtered Water	20-Mar-2013	20-Mar-2013	20-Mar-2013	20-Mar-2013	20-Mar-2013	20-Mar-2013	20-Mar-2013	20-Mar-2013	20-Mar-2013	20-Mar-2013
Sample description	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013
Silver	21-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013	21-Mar-2013
Total Dissolved Solids	15-Mar-2013	15-Mar-2013	15-Mar-2013	20-Mar-2013	20-Mar-2013	15-Mar-2013	15-Mar-2013	20-Mar-2013	15-Mar-2013	20-Mar-2013

SDG:	130311-32	**Location:**	Leachate Analysis	**Order Number:**	7895
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	216884
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -
Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

ALcontrol Laboratories

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Coffey Geotechnics Limited
9/11 Hornbeam Square South
Hornbeam Park
Harrogate
North Yorkshire
HG2 8NB

Attention: Lesley MacCormack

CERTIFICATE OF ANALYSIS

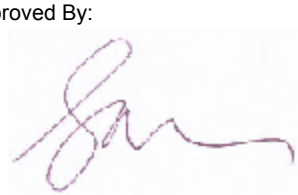
Date:	22 April 2013
Customer:	H_COFFEYGEO_HGT
Sample Delivery Group (SDG):	130402-20
Your Reference:	
Location:	Leachate Analysis
Report No:	221332

We received 10 samples on Tuesday April 02, 2013 and 10 of these samples were scheduled for analysis which was completed on Monday April 22, 2013. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
7166808	SGS 383:0286 BH6 Sample 1		10.45 - 10.90	
7166815	SGS 383:0287 BH6 Sample 2		12.55 - 12.85	
7166816	SGS 383:0288 BH6 Sample 3		21.40 - 21.75	
7166817	SGS 383:0289 BH6 Sample 4		26.85 - 27.30	
7166818	SGS 383:0290 BH6 Sample 5		32.90 - 33.30	
7166819	SGS 383:0291 BH6 Sample 6		37.10 - 37.60	
7166821	SGS 383:0292 BH6 Sample 7		40.90 - 41.40	
7166822	SGS 383:0293 BH6 Sample 8		17.90 - 18.30	
7166824	SGS 383:0294 BH6 Sample 9		44.40 - 44.90	
7166825	SGS 383:0295 BH6 Sample 10		49.00 - 49.80	

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

SOLID

Results Legend

X Test

N No Determination Possible

Lab Sample No(s)	7166808	7166815	7166816	7166817	7166818	7166819	7166821	7166822	7166824	7166825
Customer Sample Reference	SGS 383:0286 BH6	SGS 383:0287 BH6	SGS 383:0288 BH6	SGS 383:0289 BH6	SGS 383:0290 BH6	SGS 383:0291 BH6	SGS 383:0292 BH6	SGS 383:0293 BH6	SGS 383:0294 BH6	SGS 383:0295 BH6
AGS Reference										
Depth (m)	10.45 - 10.90	12.55 - 12.85	21.40 - 21.75	26.85 - 27.30	32.90 - 33.30	37.10 - 37.60	40.90 - 41.40	17.90 - 18.30	44.40 - 44.90	49.00 - 49.80
Container	BAG	BAG	BAG	BAG	BAG	BAG	BAG	BAG	BAG	BAG
Alkali Metals by iCap-OES (Soil)	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Anions by Kone (w)	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
CEN 2:1 Readings	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
CEN 8:1 Readings	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Dissolved W, Nb and Zr by ICP-MS	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Fluoride	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Mercury Dissolved	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Metals in solid samples by OES	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
pH Value of Filtered Water	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Sample description	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Silver	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X
Total Dissolved Solids	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X

CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
7166808	SGS 383:0286 BH6 Sample 1	10.45 - 10.90	Light Brown	Sand	2 - 10 mm	Stones	None
7166815	SGS 383:0287 BH6 Sample 2	12.55 - 12.85	Grey	Sand	0.1 - 2 mm	Stones	None
7166816	SGS 383:0288 BH6 Sample 3	21.40 - 21.75	Light Brown	Sand	0.1 - 2 mm	Stones	None
7166817	SGS 383:0289 BH6 Sample 4	26.85 - 27.30	Light Brown	Sand	2 - 10 mm	Stones	None
7166818	SGS 383:0290 BH6 Sample 5	32.90 - 33.30	Grey	Sand	2 - 10 mm	Stones	None
7166819	SGS 383:0291 BH6 Sample 6	37.10 - 37.60	Light Brown	Sand	0.1 - 2 mm	Stones	None
7166821	SGS 383:0292 BH6 Sample 7	40.90 - 41.40	Light Brown	Sand	0.1 - 2 mm	Stones	None
7166822	SGS 383:0293 BH6 Sample 8	17.90 - 18.30	Light Brown	Sand	0.1 - 2 mm	Stones	None
7166824	SGS 383:0294 BH6 Sample 9	44.40 - 44.90	Light Brown	Sand	0.1 - 2 mm	Stones	None
7166825	SGS 383:0295 BH6 Sample 10	49.00 - 49.80	Grey	Sand	0.1 - 2 mm	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	SGS 383:0286 BH 6 Sample 1	SGS 383:0287 BH 6 Sample 2	SGS 383:0288 BH 6 Sample 3	SGS 383:0289 BH 6 Sample 4	SGS 383:0290 BH 6 Sample 5	SGS 383:0291 BH 6 Sample 6
			Depth (m)	10.45 - 10.90	12.55 - 12.85	21.40 - 21.75	26.85 - 27.30	32.90 - 33.30	37.10 - 37.60
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	-	-	-	-	-	-
			Sample Time	.	.	.	.	.	.
			Date Received	02/04/2013	02/04/2013	02/04/2013	02/04/2013	02/04/2013	02/04/2013
			SDG Ref	130402-20	130402-20	130402-20	130402-20	130402-20	130402-20
			Lab Sample No.(s)	7166808	7166815	7166816	7166817	7166818	7166819
			AGS Reference						
Aluminium	<11 mg/kg	TM181		16100 §	51000 §	43700 §	31000 §	29500 §	23300 §
Antimony	<0.6 mg/kg	TM181		4.95 § #	1.94 § #	4.59 § #	5.07 § #	2.58 § #	1.91 § #
Arsenic	<0.6 mg/kg	TM181		1100 § M	927 § M	445 § M	851 § M	291 § M	102 § M
Barium	<0.6 mg/kg	TM181		64.5 § #	298 § #	283 § #	197 § #	120 § #	196 § #
Beryllium	<0.01 mg/kg	TM181		0.966 § M	0.492 § M	0.924 § M	2 § M	0.923 § M	0.607 § M
Boron	<0.7 mg/kg	TM181		3.11 § #	<0.7 § #	1.17 § #	2.64 § #	2.74 § #	3.19 § #
Cadmium	<0.02 mg/kg	TM181		<0.02 § M	<0.02 § M	<0.02 § M	<0.02 § M	<0.02 § M	<0.02 § M
Chromium	<0.9 mg/kg	TM181		36.6 § M	73 § M	80.8 § M	68.1 § M	52.8 § M	39.8 § M
Cobalt	<0.1 mg/kg	TM181		2.22 § M	10.6 § M	9.32 § M	12.1 § M	8.72 § M	4.55 § M
Copper	<1.4 mg/kg	TM181		65.7 § M	60.7 § M	46.7 § M	74.8 § M	38.1 § M	21.5 § M
Iron	<1000 mg/kg	TM181		32400 § #	23900 § #	52900 § #	56100 § #	48800 § #	37900 § #
Lead	<0.7 mg/kg	TM181		8.72 § M	7.51 § M	8.24 § M	11.3 § M	2.57 § M	2.35 § M
Manganese	<0.13 mg/kg	TM181		63.5 § M	271 § M	523 § M	726 § M	371 § M	442 § M
Mercury	<0.14 mg/kg	TM181		<0.14 § M	0.377 § M	<0.14 § M	<0.14 § M	<0.14 § M	<0.14 § M
Molybdenum	<0.1 mg/kg	TM181		3.32 § #	0.133 § #	1.03 § #	28.9 § #	0.525 § #	0.861 § #
Nickel	<0.2 mg/kg	TM181		12.3 § M	56.5 § M	34.4 § M	36.4 § M	42.8 § M	17.5 § M
Phosphorus	<1 mg/kg	TM181		232 §	182 §	417 §	458 §	228 §	74.5 §
Selenium	<1 mg/kg	TM181		<1 § #	<1 § #	<1 § #	3.61 § #	<1 § #	<1 § #
Strontium	<0.4 mg/kg	TM181		25.2 § #	47.2 § #	44.9 § #	13 § #	12.3 § #	6.38 § #
Tin	<0.24 mg/kg	TM181		21.3 § #	27.8 § #	11.7 § #	15.6 § #	10.7 § #	13.6 § #
Thallium	<0.7 mg/kg	TM181		<0.7 § #	<0.7 § #	<0.7 § #	<0.7 § #	1.15 § #	<0.7 § #
Titanium	<0.1 mg/kg	TM181		1070 §	1770 §	2320 §	2100 §	2110 §	2060 §
Vanadium	<0.2 mg/kg	TM181		66.9 § #	82.1 § #	104 § #	83 § #	75.7 § #	50.7 § #
Zinc	<1.9 mg/kg	TM181		13.1 § M	66.5 § M	55 § M	146 § M	27.5 § M	62.8 § M
Calcium	<21 mg/kg	TM224		507 §	224 §	227 §	1630 §	183 §	111 §
Sodium	<7 mg/kg	TM224		51 §	114 §	125 §	155 §	111 §	94.9 §
Magnesium	<8 mg/kg	TM224		2430 §	6050 §	7930 §	9160 §	9890 §	6350 §
Potassium	<16 mg/kg	TM224		4580 §	9440 §	14100 §	19100 §	20400 §	17300 §
Silver	<10 mg/kg	TM250		<10 §	<10 §	<10 §	<10 §	<10 §	<10 §

CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	SGS 383:0292 BH 6 Sample 7	SGS 383:0293 BH 6 Sample 8	SGS 383:0294 BH 6 Sample 9	SGS 383:0295 BH 6 Sample 10		
			Depth (m)	40.90 - 41.40	17.90 - 18.30	44.40 - 44.90	49.00 - 49.80		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid		
			Date Sampled	-	-	-	-		
			Sample Time	.	.	.	.		
			Date Received	02/04/2013	02/04/2013	02/04/2013	02/04/2013		
			SDG Ref	130402-20	130402-20	130402-20	130402-20		
			Lab Sample No.(s)	7166821	7166822	7166824	7166825		
			AGS Reference						
Aluminium	<11 mg/kg	TM181		21300 §	29400 §	24900 §	48400 §		
Antimony	<0.6 mg/kg	TM181		2.01 § #	2.45 § #	2.84 § #	3.58 § #		
Arsenic	<0.6 mg/kg	TM181		65.5 § M	547 § M	108 § M	460 § M		
Barium	<0.6 mg/kg	TM181		101 § #	118 § #	67.8 § #	192 § #		
Beryllium	<0.01 mg/kg	TM181		0.52 § M	0.589 § M	0.525 § M	2.23 § M		
Boron	<0.7 mg/kg	TM181		5.8 § #	1.51 § #	2.17 § #	2.97 § #		
Cadmium	<0.02 mg/kg	TM181		<0.02 § M	<0.02 § M	<0.02 § M	<0.02 § M		
Chromium	<0.9 mg/kg	TM181		38.7 § M	54.5 § M	38.2 § M	3.74 § M		
Cobalt	<0.1 mg/kg	TM181		4.22 § M	6.11 § M	4.87 § M	3.75 § M		
Copper	<1.4 mg/kg	TM181		22.3 § M	32.2 § M	23 § M	43.9 § M		
Iron	<1000 mg/kg	TM181		30700 § #	53600 § #	40400 § #	64200 § #		
Lead	<0.7 mg/kg	TM181		3.84 § M	6.88 § M	2.74 § M	5.07 § M		
Manganese	<0.13 mg/kg	TM181		360 § M	507 § M	437 § M	1150 § M		
Mercury	<0.14 mg/kg	TM181		<0.14 § M	<0.14 § M	<0.14 § M	<0.14 § M		
Molybdenum	<0.1 mg/kg	TM181		0.437 § #	0.176 § #	0.782 § #	0.43 § #		
Nickel	<0.2 mg/kg	TM181		22.4 § M	23.7 § M	25.9 § M	8.54 § M		
Phosphorus	<1 mg/kg	TM181		315 §	85.8 §	52.6 §	240 §		
Selenium	<1 mg/kg	TM181		<1 § #	<1 § #	<1 § #	<1 § #		
Strontium	<0.4 mg/kg	TM181		22 § #	4.36 § #	6.76 § #	7.45 § #		
Tin	<0.24 mg/kg	TM181		12.8 § #	9.44 § #	19.5 § #	28.3 § #		
Thallium	<0.7 mg/kg	TM181		<0.7 § #	<0.7 § #	1.16 § #	1.46 § #		
Titanium	<0.1 mg/kg	TM181		1830 §	2610 §	1840 §	1540 §		
Vanadium	<0.2 mg/kg	TM181		53.3 § #	77.4 § #	53.7 § #	4.87 § #		
Zinc	<1.9 mg/kg	TM181		77.1 § M	56.6 § M	54.6 § M	126 § M		
Calcium	<21 mg/kg	TM224		560 §	411 §	58.3 §	213 §		
Sodium	<7 mg/kg	TM224		124 §	110 §	97.7 §	136 §		
Magnesium	<8 mg/kg	TM224		4120 §	10100 §	8030 §	13600 §		
Potassium	<16 mg/kg	TM224		12500 §	23200 §	17100 §	31900 §		
Silver	<10 mg/kg	TM250		<10 §	<10 §	<10 §	<10 §		

CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.341
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case	
SDG	130402-20
Lab Sample Number(s)	7166808
Sampled Date	
Customer Sample Ref.	SGS 383:0286 BH6 Sample 1
Depth (m)	10.45 - 10.90

Solid Waste Analysis		**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.0161	0.0136	0.0321	0.14	0.5	2	25
Barium	0.0195	0.00111	0.0389	0.039	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.00138	0.000424	0.00275	0.00569	0.5	10	70
Copper	0.00165	<0.00085	0.0033	<0.0085	2	50	100
Mercury Dissolved (CVAF)	0.000291	<0.00001	0.00058	0.000441	0.01	0.2	2
Molybdenum	<0.00024	0.000473	<0.000479	0.00401	0.5	10	30
Nickel	0.000164	<0.00015	0.000328	<0.0015	0.4	10	40
Lead	0.000237	0.000977	0.000474	0.00865	0.5	10	50
Antimony	0.00086	0.000948	0.00172	0.00934	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	0.000947	<0.00041	0.00189	<0.0041	4	50	200
Chloride	2.7	<2	5.39	<20	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	57.6	6.46	115	142	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.938	8.364
Conductivity (µS/cm)	28.70	17.48
Temperature (°C)	19.70	19.40
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.265	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.341
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166808			
Sampled Date				
Customer Sample Ref.	SGS 383:0286 BH6 Sample 1			
Depth (m)	10.45 - 10.90			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.83	6.7	16	69	-	-	-
Aluminium	0.0956	0.055	0.191	0.611	-	-	-
Calcium	11.8	<0.012	23.5	17.9	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	1.8	<0.076	3.59	2.73	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.23	<0.036	0.459	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	2.39	<2.34	4.77	<23.4	-	-	-
Beryllium	<0.00007	0.00009	<0.00014	0.000764	-	-	-
Iron	0.118	0.112	0.235	1.13	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0896	0.0244	0.179	0.343	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0213	0.0043	0.0425	0.0688	-	-	-
Manganese	0.00134	0.000194	0.00268	0.00367	-	-	-
Phosphorus	0.0132	<0.0063	0.0263	<0.063	-	-	-
Strontium	0.0346	0.000844	0.0692	0.0596	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	0.000404	<0.000719	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.938	8.364
Conductivity (µS/cm)	28.70	17.48
Temperature (°C)	19.70	19.40
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.265	

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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.341
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166808			
Sampled Date				
Customer Sample Ref.	SGS 383:0286 BH6 Sample 1			
Depth (m)	10.45 - 10.90			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00328	0.00284	0.00656	0.0291	-	-	-
Vanadium	0.000846	0.000472	0.00169	0.00529	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.938	8.364
Conductivity (µS/cm)	28.70	17.48
Temperature (°C)	19.70	19.40
Volume Leachant (Litres)	0.349	1.400
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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.180	**Moisture Content Ratio (%)**	3.15
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	97
Particle Size <4mm	>95%		

Case	
SDG	130402-20
Lab Sample Number(s)	7166815
Sampled Date	
Customer Sample Ref.	SGS 383:0287 BH6 Sample 2
Depth (m)	12.55 - 12.85

Solid Waste Analysis		**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.033	0.0289	0.0659	0.295	0.5	2	25
Barium	0.00534	0.00758	0.0107	0.0723	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000664	0.000269	0.00133	0.0033	0.5	10	70
Copper	0.00213	0.00103	0.00425	0.012	2	50	100
Mercury Dissolved (CVAF)	0.00022	<0.00001	0.00044	0.000339	0.01	0.2	2
Molybdenum	<0.00024	<0.00024	<0.000479	<0.0024	0.5	10	30
Nickel	0.000323	<0.00015	0.000645	<0.0015	0.4	10	40
Lead	0.0154	0.000636	0.0308	0.0291	0.5	10	50
Antimony	0.000386	<0.00016	0.000771	<0.0016	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	0.0142	0.00614	0.0283	0.0739	4	50	200
Chloride	10.7	2.1	21.4	34.3	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	56.4	13.7	113	203	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.298	6.898
Conductivity (µS/cm)	40.00	14.37
Temperature (°C)	19.80	19.60
Volume Leachant (Litres)	0.344	1.400
Volume of Eluate VE1 (Litres)	0.270	

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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.180	**Moisture Content Ratio (%)**	3.15
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	97
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166815			
Sampled Date				
Customer Sample Ref.	SGS 383:0287 BH6 Sample 2			
Depth (m)	12.55 - 12.85			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	8.45	6.6	17	69	-	-	-
Aluminium	0.0381	0.0412	0.0761	0.407	-	-	-
Calcium	7.33	0.688	14.6	17.1	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	7.14	1.92	14.3	27.3	-	-	-
Zirconium	<0.002	<0.002	<0.00399	<0.02	-	-	-
Magnesium	0.14	<0.036	0.28	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	<2.34	<2.34	<4.67	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	<0.019	<0.019	<0.0379	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.0116	<0.0094	0.0231	<0.094	-	-	-
Cobalt	0.000557	0.000242	0.00111	0.00291	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.00247	<0.00192	0.00494	<0.0192	-	-	-
Manganese	0.00512	0.00134	0.0102	0.0192	-	-	-
Phosphorus	0.00841	<0.0063	0.0168	<0.063	-	-	-
Strontium	0.0121	0.00194	0.0242	0.0351	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.000719	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.298	6.898
Conductivity (µS/cm)	40.00	14.37
Temperature (°C)	19.80	19.60
Volume Leachant (Litres)	0.344	1.400
Volume of Eluate VE1 (Litres)	0.270	

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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

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Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	97
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166815			
Sampled Date				
Customer Sample Ref.	SGS 383:0287 BH6 Sample 2			
Depth (m)	12.55 - 12.85			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Vanadium	0.000653	0.000308	0.0013	0.00361	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.298	6.898
Conductivity (µS/cm)	40.00	14.37
Temperature (°C)	19.80	19.60
Volume Leachant (Litres)	0.344	1.400
Volume of Eluate VE1 (Litres)	0.270	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	1.52
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98.5
Particle Size <4mm	>95%		

Case	
SDG	130402-20
Lab Sample Number(s)	7166816
Sampled Date	
Customer Sample Ref.	SGS 383:0288 BH6 Sample 3
Depth (m)	21.40 - 21.75

Solid Waste Analysis		**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.0013	0.00102	0.0026	0.0106	0.5	2	25
Barium	0.0023	0.0028	0.0046	0.0272	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	<0.00022	<0.00022	<0.00044	<0.0022	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	<0.00024	0.000249	<0.00048	<0.0024	0.5	10	30
Nickel	<0.00015	<0.00015	<0.0003	<0.0015	0.4	10	40
Lead	0.000387	0.00132	0.000773	0.0116	0.5	10	50
Antimony	<0.00016	0.000795	<0.00032	0.00663	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	0.00773	0.0133	0.0154	0.123	4	50	200
Chloride	12.2	<2	24.4	20.2	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	39.5	11	78.9	157	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.914	6.816
Conductivity (µS/cm)	46.10	11.18
Temperature (°C)	19.60	19.70
Volume Leachant (Litres)	0.347	1.400
Volume of Eluate VE1 (Litres)	0.290	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	1.52
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98.5
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166816			
Sampled Date				
Customer Sample Ref.	SGS 383:0288 BH6 Sample 3			
Depth (m)	21.40 - 21.75			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.62	6.2	13	63	-	-	-
Aluminium	0.0103	0.015	0.0207	0.142	-	-	-
Calcium	0.744	<0.012	1.49	1.23	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	7.14	1.18	14.3	21.7	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.14	<0.036	0.28	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	2.71	<2.34	5.41	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	<0.019	<0.019	<0.038	<0.19	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	0.000196	<0.00032	0.00163	-	-	-
Boron	<0.0094	<0.0094	<0.0188	<0.094	-	-	-
Cobalt	<0.00006	0.000102	<0.00012	0.000851	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.00819	0.00401	0.0164	0.047	-	-	-
Manganese	0.00341	0.00232	0.00682	0.025	-	-	-
Phosphorus	0.00868	0.00753	0.0173	0.0772	-	-	-
Strontium	0.00454	0.000791	0.00907	0.0141	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.000719	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.914	6.816
Conductivity (µS/cm)	46.10	11.18
Temperature (°C)	19.60	19.70
Volume Leachant (Litres)	0.347	1.400
Volume of Eluate VE1 (Litres)	0.290	

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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	1.52
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98.5
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166816			
Sampled Date				
Customer Sample Ref.	SGS 383:0288 BH6 Sample 3			
Depth (m)	21.40 - 21.75			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00191	<0.0015	0.00382	<0.015	-	-	-
Vanadium	<0.00024	<0.00024	<0.00048	<0.0024	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.914	6.816
Conductivity (µS/cm)	46.10	11.18
Temperature (°C)	19.60	19.70
Volume Leachant (Litres)	0.347	1.400
Volume of Eluate VE1 (Litres)	0.290	

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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	1.51
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98.5
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166817			
Sampled Date				
Customer Sample Ref.	SGS 383:0289 BH6 Sample 4			
Depth (m)	26.85 - 27.30			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0729	0.0851	0.146	0.83	0.5	2	25
Barium	0.00137	0.00133	0.00274	0.0134	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	<0.00022	<0.00022	<0.00044	<0.0022	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.0253	0.0201	0.0505	0.209	0.5	10	30
Nickel	0.000203	<0.00015	0.000406	<0.0015	0.4	10	40
Lead	0.000211	0.000617	0.000422	0.0055	0.5	10	50
Antimony	0.0035	0.00416	0.007	0.0405	0.06	0.7	5
Selenium	<0.00039	0.000404	<0.000779	<0.0039	0.1	0.5	7
Zinc	0.00368	0.000821	0.00735	0.0129	4	50	200
Chloride	3.4	<2	6.79	<20	800	15000	25000
Fluoride	1.03	1.04	2.07	10.3	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	18.6	12.8	37.2	137	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.173	8.067
Conductivity (µS/cm)	21.50	11.00
Temperature (°C)	19.50	19.50
Volume Leachant (Litres)	0.347	1.400
Volume of Eluate VE1 (Litres)	0.290	

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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	1.51
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98.5
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166817			
Sampled Date				
Customer Sample Ref.	SGS 383:0289 BH6 Sample 4			
Depth (m)	26.85 - 27.30			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.56	6.3	13	63	-	-	-
Aluminium	0.079	0.133	0.158	1.24	-	-	-
Calcium	0.054	<0.012	0.108	<0.12	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	2.94	1.11	5.87	14.1	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.107	0.0848	0.213	0.885	-	-	-
Tungsten	0.00412	0.0041	0.00823	0.041	-	-	-
Potassium	<2.34	<2.34	<4.68	<23.4	-	-	-
Beryllium	<0.00007	0.000197	<0.00014	0.00164	-	-	-
Iron	0.0582	0.0687	0.116	0.669	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.000481	0.00035	0.000961	0.00372	-	-	-
Boron	0.0391	0.0165	0.0781	0.203	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0695	0.0375	0.139	0.428	-	-	-
Manganese	0.00142	0.000606	0.00284	0.00741	-	-	-
Phosphorus	0.0252	0.038	0.0503	0.359	-	-	-
Strontium	0.00139	0.00104	0.00278	0.011	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	0.000928	<0.000719	0.00774	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.173	8.067
Conductivity (µS/cm)	21.50	11.00
Temperature (°C)	19.50	19.50
Volume Leachant (Litres)	0.347	1.400
Volume of Eluate VE1 (Litres)	0.290	

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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.178	**Moisture Content Ratio (%)**	1.51
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	98.5
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166817			
Sampled Date				
Customer Sample Ref.	SGS 383:0289 BH6 Sample 4			
Depth (m)	26.85 - 27.30			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00477	0.00288	0.00954	0.032	-	-	-
Vanadium	0.000529	0.000297	0.00106	0.00335	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.173	8.067
Conductivity (µS/cm)	21.50	11.00
Temperature (°C)	19.50	19.50
Volume Leachant (Litres)	0.347	1.400
Volume of Eluate VE1 (Litres)	0.290	

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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.17
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166818			
Sampled Date				
Customer Sample Ref.	SGS 383:0290 BH6 Sample 5			
Depth (m)	32.90 - 33.30			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0175	0.0169	0.035	0.17	0.5	2	25
Barium	0.00118	0.003	0.00236	0.0271	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.00029	0.000341	0.000581	0.00333	0.5	10	70
Copper	0.00144	<0.00085	0.00287	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.000768	0.000865	0.00154	0.0085	0.5	10	30
Nickel	<0.00015	<0.00015	<0.0003	<0.0015	0.4	10	40
Lead	0.000511	0.000119	0.00102	0.00181	0.5	10	50
Antimony	0.00145	<0.00016	0.00291	0.00228	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000781	<0.0039	0.1	0.5	7
Zinc	0.000412	0.00233	0.000825	0.0203	4	50	200
Chloride	5.5	<2	11	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	31.5	6.86	63.1	107	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.034	6.785
Conductivity (µS/cm)	32.70	8.27
Temperature (°C)	19.40	19.50
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.275	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.17
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166818			
Sampled Date				
Customer Sample Ref.	SGS 383:0290 BH6 Sample 5			
Depth (m)	32.90 - 33.30			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.62	6.3	13	64	-	-	-
Aluminium	0.0953	0.0753	0.191	0.784	-	-	-
Calcium	0.88	<0.012	1.76	1.38	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	2.46	0.139	4.92	5.03	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.149	<0.036	0.299	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	4.98	<2.34	9.96	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0713	0.0551	0.143	0.577	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.00018	0.000163	0.00036	0.00166	-	-	-
Boron	0.132	0.023	0.263	0.401	-	-	-
Cobalt	0.000208	<0.00006	0.000416	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0379	0.00351	0.0758	0.0891	-	-	-
Manganese	0.00408	0.000851	0.00816	0.0136	-	-	-
Phosphorus	<0.0063	<0.0063	<0.0126	<0.063	-	-	-
Strontium	0.00219	0.000752	0.00439	0.00978	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.000721	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.034	6.785
Conductivity (µS/cm)	32.70	8.27
Temperature (°C)	19.40	19.50
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.275	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.17
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166818			
Sampled Date				
Customer Sample Ref.	SGS 383:0290 BH6 Sample 5			
Depth (m)	32.90 - 33.30			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00413	0.00243	0.00826	0.0269	-	-	-
Vanadium	0.000594	0.000427	0.00119	0.00453	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.034	6.785
Conductivity (µS/cm)	32.70	8.27
Temperature (°C)	19.40	19.50
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.275	

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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.15
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

Case	
SDG	130402-20
Lab Sample Number(s)	7166819
Sampled Date	
Customer Sample Ref.	SGS 383:0291 BH6 Sample 6
Depth (m)	37.10 - 37.60

Solid Waste Analysis		**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0114	0.00803	0.0228	0.086	0.5	2	25
Barium	0.0037	0.00244	0.0074	0.0265	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000327	0.000365	0.000655	0.00359	0.5	10	70
Copper	0.00175	0.0011	0.00351	0.0121	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.000985	0.00317	0.00197	0.0281	0.5	10	30
Nickel	0.000182	<0.00015	0.000364	<0.0015	0.4	10	40
Lead	0.00014	0.000767	0.00028	0.00661	0.5	10	50
Antimony	0.000927	0.00729	0.00186	0.0622	0.06	0.7	5
Selenium	<0.00039	0.000636	<0.000781	0.00529	0.1	0.5	7
Zinc	0.00312	0.00168	0.00624	0.0192	4	50	200
Chloride	<2	<2	<4	<20	800	15000	25000
Fluoride	0.751	0.506	1.5	5.47	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	37.5	18.7	75.1	219	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.125	6.753
Conductivity (µS/cm)	31.40	17.46
Temperature (°C)	19.50	19.80
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.295	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.15
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166819			
Sampled Date				
Customer Sample Ref.	SGS 383:0291 BH6 Sample 6			
Depth (m)	37.10 - 37.60			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.54	6.6	15	67	-	-	-
Aluminium	0.0749	0.117	0.15	1.1	-	-	-
Calcium	6.13	2.1	12.3	27.8	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	1.1	0.317	2.19	4.49	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.0707	0.126	0.142	1.17	-	-	-
Tungsten	0.00851	0.0103	0.017	0.1	-	-	-
Potassium	4.55	<2.34	9.1	<23.4	-	-	-
Beryllium	<0.00007	0.000257	<0.00014	0.00214	-	-	-
Iron	0.0694	0.0888	0.139	0.855	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.000238	0.000345	0.000476	0.00327	-	-	-
Boron	0.141	0.0431	0.282	0.596	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0512	0.00466	0.103	0.125	-	-	-
Manganese	0.12	0.00979	0.24	0.284	-	-	-
Phosphorus	0.00906	0.0137	0.0181	0.129	-	-	-
Strontium	0.0204	0.00248	0.0408	0.055	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	0.00236	<0.000721	0.0196	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.125	6.753
Conductivity (µS/cm)	31.40	17.46
Temperature (°C)	19.50	19.80
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.295	

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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.15
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.9
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166819			
Sampled Date				
Customer Sample Ref.	SGS 383:0291 BH6 Sample 6			
Depth (m)	37.10 - 37.60			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.0043	0.00507	0.0086	0.0494	-	-	-
Vanadium	0.000642	0.000737	0.00129	0.00721	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.125	6.753
Conductivity (µS/cm)	31.40	17.46
Temperature (°C)	19.50	19.80
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.295	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.231
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

Case	
SDG	130402-20
Lab Sample Number(s)	7166821
Sampled Date	
Customer Sample Ref.	SGS 383:0292 BH6 Sample 7
Depth (m)	40.90 - 41.40

Solid Waste Analysis		**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	mg/l		mg/kg				
Arsenic	0.018	0.0103	0.0359	0.116	0.5	2	25
Barium	0.0204	0.00111	0.0408	0.0436	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.00104	0.000239	0.00208	0.00374	0.5	10	70
Copper	0.000979	<0.00085	0.00196	<0.0085	2	50	100
Mercury Dissolved (CVAF)	0.0000305	<0.00001	0.0000611	<0.0001	0.01	0.2	2
Molybdenum	0.00163	0.000881	0.00326	0.0101	0.5	10	30
Nickel	0.000178	<0.00015	0.000356	<0.0015	0.4	10	40
Lead	0.000219	0.000281	0.000439	0.00271	0.5	10	50
Antimony	0.0028	0.00081	0.00561	0.0115	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000781	<0.0039	0.1	0.5	7
Zinc	0.000715	0.00154	0.00143	0.014	4	50	200
Chloride	2.1	<2	4.2	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	48.2	5.11	96.5	124	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.644	6.670
Conductivity (µS/cm)	19.92	6.26
Temperature (°C)	19.70	19.70
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.295	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.231
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166821			
Sampled Date				
Customer Sample Ref.	SGS 383:0292 BH6 Sample 7			
Depth (m)	40.90 - 41.40			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.83	6.4	16	66	-	-	-
Aluminium	0.107	0.0694	0.215	0.758	-	-	-
Calcium	10	<0.012	20.1	16.9	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	1.27	<0.076	2.54	2.14	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.111	<0.036	0.222	<0.36	-	-	-
Tungsten	0.00539	0.0026	0.0108	0.0307	-	-	-
Potassium	3.71	<2.34	7.44	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0492	0.0345	0.0985	0.37	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	<0.00016	<0.00016	<0.00032	<0.0016	-	-	-
Boron	0.319	0.0685	0.638	1.11	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.00977	<0.00192	0.0196	<0.0192	-	-	-
Manganese	0.0527	0.00101	0.105	0.0973	-	-	-
Phosphorus	0.0126	0.0146	0.0252	0.143	-	-	-
Strontium	0.0165	0.000124	0.033	0.0288	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.000721	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.644	6.670
Conductivity (µS/cm)	19.92	6.26
Temperature (°C)	19.70	19.70
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.295	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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Mcerts Certification does not apply to leachates
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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.231
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.8
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166821			
Sampled Date				
Customer Sample Ref.	SGS 383:0292 BH6 Sample 7			
Depth (m)	40.90 - 41.40			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00418	0.0028	0.00838	0.0303	-	-	-
Vanadium	0.0012	0.000769	0.0024	0.00842	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.644	6.670
Conductivity (µS/cm)	19.92	6.26
Temperature (°C)	19.70	19.70
Volume Leachant (Litres)	0.350	1.400
Volume of Eluate VE1 (Litres)	0.295	

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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.321
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

Case	
SDG	130402-20
Lab Sample Number(s)	7166822
Sampled Date	
Customer Sample Ref.	SGS 383:0293 BH6 Sample 8
Depth (m)	17.90 - 18.30

Solid Waste Analysis

		Landfill Waste Acceptance Criteria Limits		
		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0159	0.0222	0.0317	0.211	0.5	2	25
Barium	0.00159	0.00129	0.00318	0.0134	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	<0.00022	0.000298	<0.000439	0.00248	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	<0.00024	0.000329	<0.000479	0.00273	0.5	10	30
Nickel	<0.00015	<0.00015	<0.0003	<0.0015	0.4	10	40
Lead	0.000176	0.00002	0.000352	0.000463	0.5	10	50
Antimony	<0.00016	0.000628	<0.00032	0.00522	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	0.000488	0.000621	0.000975	0.00598	4	50	200
Chloride	2.7	<2	5.39	<20	800	15000	25000
Fluoride	<0.5	<0.5	<0.999	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	14.8	10.7	29.6	114	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information

	2:1	8:1
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.471	7.184
Conductivity (µS/cm)	14.82	5.66
Temperature (°C)	19.70	19.70
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.295	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.321
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166822			
Sampled Date				
Customer Sample Ref.	SGS 383:0293 BH6 Sample 8			
Depth (m)	17.90 - 18.30			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.8	6.9	14	69	-	-	-
Aluminium	0.0633	0.0861	0.126	0.823	-	-	-
Calcium	0.319	1.37	0.638	11.9	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	0.959	<0.076	1.92	1.62	-	-	-
Zirconium	<0.002	<0.002	<0.004	<0.02	-	-	-
Magnesium	0.0989	<0.036	0.198	<0.36	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	2.37	<2.34	4.73	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0497	0.0478	0.0993	0.481	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.000171	<0.00016	0.000342	<0.0016	-	-	-
Boron	0.0268	0.0119	0.0536	0.144	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0341	0.00536	0.0681	0.102	-	-	-
Manganese	0.00207	0.0154	0.00413	0.132	-	-	-
Phosphorus	0.011	<0.0063	0.022	<0.063	-	-	-
Strontium	0.00185	0.00406	0.00369	0.0368	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	<0.00036	<0.000719	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.471	7.184
Conductivity (µS/cm)	14.82	5.66
Temperature (°C)	19.70	19.70
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.295	

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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.321
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166822			
Sampled Date				
Customer Sample Ref.	SGS 383:0293 BH6 Sample 8			
Depth (m)	17.90 - 18.30			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.0039	0.00367	0.00778	0.0371	-	-	-
Vanadium	0.000432	0.000523	0.000863	0.00508	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	6.471	7.184
Conductivity (µS/cm)	14.82	5.66
Temperature (°C)	19.70	19.70
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.295	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.291
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166824			
Sampled Date				
Customer Sample Ref.	SGS 383:0294 BH6 Sample 9			
Depth (m)	44.40 - 44.90			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0153	0.0146	0.0306	0.147	0.5	2	25
Barium	0.00224	0.0265	0.00448	0.226	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.000359	0.000348	0.000717	0.0035	0.5	10	70
Copper	0.00146	0.00212	0.00291	0.0201	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	0.00264	0.00114	0.00527	0.0138	0.5	10	30
Nickel	<0.00015	<0.00015	<0.0003	<0.0015	0.4	10	40
Lead	0.000036	0.000094	0.0000719	0.000845	0.5	10	50
Antimony	0.00107	0.000904	0.00214	0.00931	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000779	<0.0039	0.1	0.5	7
Zinc	<0.00041	0.00147	<0.000819	0.0123	4	50	200
Chloride	<2	<2	<3.99	<20	800	15000	25000
Fluoride	0.639	<0.5	1.28	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	29.1	13.8	58.1	163	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.568	6.817
Conductivity (µS/cm)	24.40	7.62
Temperature (°C)	19.70	19.70
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.285	

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14:31:34 22/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.291
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166824			
Sampled Date				
Customer Sample Ref.	SGS 383:0294 BH6 Sample 9			
Depth (m)	44.40 - 44.90			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	7.46	6.6	15	67	-	-	-
Aluminium	0.092	0.131	0.184	1.25	-	-	-
Calcium	4.15	0.922	8.29	14.5	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	0.819	0.189	1.64	2.91	-	-	-
Zirconium	<0.002	<0.002	<0.00399	<0.02	-	-	-
Magnesium	0.29	0.0931	0.579	1.25	-	-	-
Tungsten	0.00417	0.00176	0.00833	0.0215	-	-	-
Potassium	3.62	<2.34	7.22	<23.4	-	-	-
Beryllium	<0.00007	<0.00007	<0.00014	<0.0007	-	-	-
Iron	0.0598	0.0941	0.119	0.885	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.000212	0.00017	0.000423	0.00177	-	-	-
Boron	0.0514	0.0152	0.103	0.211	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0319	0.00398	0.0636	0.0852	-	-	-
Manganese	0.00223	0.00288	0.00445	0.0277	-	-	-
Phosphorus	0.0409	<0.0063	0.0816	0.0666	-	-	-
Strontium	0.0109	0.0133	0.0218	0.129	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	0.000414	<0.000719	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.568	6.817
Conductivity (µS/cm)	24.40	7.62
Temperature (°C)	19.70	19.70
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.285	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
22/04/2013 14:31:49

14:31:34 22/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.175	**Moisture Content Ratio (%)**	0.291
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.7
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166824			
Sampled Date				
Customer Sample Ref.	SGS 383:0294 BH6 Sample 9			
Depth (m)	44.40 - 44.90			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00417	0.00415	0.00832	0.0415	-	-	-
Vanadium	0.00112	0.000901	0.00224	0.00936	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.568	6.817
Conductivity (µS/cm)	24.40	7.62
Temperature (°C)	19.70	19.70
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.285	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.847
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.2
Particle Size <4mm	>95%		

Case	
SDG	130402-20
Lab Sample Number(s)	7166825
Sampled Date	
Customer Sample Ref.	SGS 383:0295 BH6 Sample 10
Depth (m)	49.00 - 49.80

Solid Waste Analysis

		Landfill Waste Acceptance Criteria Limits		
		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Arsenic	0.0297	0.027	0.0594	0.275	0.5	2	25
Barium	0.00141	0.00077	0.00282	0.0088	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	<0.00022	0.00023	<0.000441	<0.0022	0.5	10	70
Copper	<0.00085	<0.00085	<0.0017	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	<0.00024	0.000536	<0.000481	0.00444	0.5	10	30
Nickel	<0.00015	<0.00015	<0.0003	<0.0015	0.4	10	40
Lead	<0.00002	0.000042	<0.0000401	0.000348	0.5	10	50
Antimony	0.000733	0.00167	0.00147	0.0151	0.06	0.7	5
Selenium	<0.00039	<0.00039	<0.000781	<0.0039	0.1	0.5	7
Zinc	0.00154	<0.00041	0.00308	<0.0041	4	50	200
Chloride	3.4	<2	6.81	<20	800	15000	25000
Fluoride	<0.5	<0.5	<1	<5	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	18.3	7.14	36.7	90.6	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information

	2:1	8:1
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.491	7.233
Conductivity (µS/cm)	21.60	6.50
Temperature (°C)	19.50	19.60
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.300	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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14:31:34 22/04/2013

CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.847
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.2
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166825			
Sampled Date				
Customer Sample Ref.	SGS 383:0295 BH6 Sample 10			
Depth (m)	49.00 - 49.80			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
pH Value of Filtered Water	6.76	6.3	14	63	-	-	-
Aluminium	0.0276	0.0512	0.0552	0.471	-	-	-
Calcium	0.415	<0.012	0.83	0.711	-	-	-
Niobium	<0.053	<0.053	<0.106	<0.53	-	-	-
Sodium	1.87	0.327	3.74	5.91	-	-	-
Zirconium	<0.002	<0.002	<0.00401	<0.02	-	-	-
Magnesium	0.0981	0.0699	0.196	0.748	-	-	-
Tungsten	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Potassium	2.44	<2.34	4.89	<23.4	-	-	-
Beryllium	<0.00007	0.000089	<0.00014	0.000738	-	-	-
Iron	<0.019	0.0323	<0.0381	0.268	-	-	-
Silver	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Bismuth	0.000175	<0.00016	0.000351	<0.0016	-	-	-
Boron	0.0174	0.0116	0.0349	0.126	-	-	-
Cobalt	<0.00006	<0.00006	<0.00012	<0.0006	-	-	-
Sulphate (soluble) as S	<1	<1	<2	<10	-	-	-
Lithium	0.0339	0.0144	0.0679	0.177	-	-	-
Manganese	0.00175	0.000483	0.00349	0.007	-	-	-
Phosphorus	0.00676	<0.0063	0.0135	<0.063	-	-	-
Strontium	0.00228	0.00057	0.00457	0.00863	-	-	-
Thallium	<0.00096	<0.00096	<0.00192	<0.0096	-	-	-
Tin	<0.00036	0.000385	<0.000721	<0.0036	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.491	7.233
Conductivity (µS/cm)	21.60	6.50
Temperature (°C)	19.50	19.60
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.300	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/3

Client Reference		**Site Location**	Leachate Analysis
Mass Sample taken (kg)	0.176	**Moisture Content Ratio (%)**	0.847
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	99.2
Particle Size <4mm	>95%		

		Landfill Waste Acceptance Criteria Limits		
Case				
SDG	130402-20			
Lab Sample Number(s)	7166825			
Sampled Date				
Customer Sample Ref.	SGS 383:0295 BH6 Sample 10			
Depth (m)	49.00 - 49.80			
Solid Waste Analysis		**Inert Waste Landfill**	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	C_2 Concⁿ in 2:1 eluate	C_8 Concⁿ in 8:1 eluate	A_2 2:1 concⁿ leached	$A_{2\text{-}10}$ Cumulative concⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l		mg/kg				
Uranium	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Titanium	0.00238	0.00185	0.00476	0.0194	-	-	-
Vanadium	0.000242	0.000294	0.000485	0.00285	-	-	-

Leach Test Information	**2:1**	**8:1**
Date Prepared	04-Apr-2013	05-Apr-2013
pH (pH Units)	7.491	7.233
Conductivity (µS/cm)	21.60	6.50
Temperature (°C)	19.50	19.60
Volume Leachant (Litres)	0.349	1.400
Volume of Eluate VE1 (Litres)	0.300	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM114		Leaching Procedure for CEN Two Stage BatchTest 2:1/8:1 Cumulative		
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM224	US EPA Method 6010B	Determination of Alkaline Metals by iCap 6500 Duo ICP-OES		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM250		Determination of Silver in Soil by ICP-OES		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM283		Determination of Dissolved Niobium, Tungsten, and Zirconium in Water Matrices by ICP-MS		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	7166808	7166815	7166816	7166817	7166818	7166819	7166821	7166822	7166824	7166825
Customer Sample Ref.	SGS 383:0286 BH 6 Sample 1	SGS 383:0287 BH 6 Sample 2	SGS 383:0288 BH 6 Sample 3	SGS 383:0289 BH 6 Sample 4	SGS 383:0290 BH 6 Sample 5	SGS 383:0291 BH 6 Sample 6	SGS 383:0292 BH 6 Sample 7	SGS 383:0293 BH 6 Sample 8	SGS 383:0294 BH 6 Sample 9	SGS 383:0295 BH 6 Sample 10
AGS Ref.										
Depth	10.45 - 10.90	12.55 - 12.85	21.40 - 21.75	26.85 - 27.30	32.90 - 33.30	37.10 - 37.60	40.90 - 41.40	17.90 - 18.30	44.40 - 44.90	49.00 - 49.80
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Alkali Metals by iCap-OES (Soil)	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013
Anions by Kone (w)	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013
CEN 2:1 Leachate (2 Stage)	04-Apr-2013	04-Apr-2013	04-Apr-2013	04-Apr-2013	04-Apr-2013	04-Apr-2013	04-Apr-2013	04-Apr-2013	04-Apr-2013	04-Apr-2013
CEN 2:1 Readings	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013
CEN 8:1 Leachate (2 Stage)	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013	08-Apr-2013
CEN 8:1 Readings	08-Apr-2013	10-Apr-2013	09-Apr-2013	09-Apr-2013	10-Apr-2013	09-Apr-2013	10-Apr-2013	09-Apr-2013	09-Apr-2013	09-Apr-2013
Dissolved Metals by ICP-MS	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013
Dissolved W, Nb and Zr by ICP-MS	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013	12-Apr-2013
Fluoride	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013
Mercury Dissolved	11-Apr-2013	11-Apr-2013	16-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013
Metals by iCap-OES Dissolved (W)	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013	11-Apr-2013
Metals in solid samples by OES	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013
pH Value of Filtered Water	11-Apr-2013	10-Apr-2013	10-Apr-2013	10-Apr-2013	10-Apr-2013	10-Apr-2013	10-Apr-2013	10-Apr-2013	10-Apr-2013	10-Apr-2013
Sample description	16-Apr-2013	16-Apr-2013	16-Apr-2013	16-Apr-2013	16-Apr-2013	16-Apr-2013	16-Apr-2013	16-Apr-2013	16-Apr-2013	16-Apr-2013
Silver	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013	22-Apr-2013
Total Dissolved Solids	11-Apr-2013	11-Apr-2013	10-Apr-2013	10-Apr-2013	11-Apr-2013	10-Apr-2013	11-Apr-2013	10-Apr-2013	10-Apr-2013	10-Apr-2013

SDG:	130402-20	**Location:**	Leachate Analysis	**Order Number:**	7968
Job:	H_COFFEYGEO_HGT-1	**Customer:**	Coffey Geotechnics Limited	**Report Number:**	221332
Client Reference:		**Attention:**	Lesley MacCormack	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -
Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

APPENDIX 3C-13

IMO Everything Metallurgy

Hemerdon Project Soft Rock Pilot Testwork Report

Hemerdon Project
Soft Rock Pilot Testwork Report

(Wolf Minerals Pilot Campaign Testwork Report)
July - November 2011

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Contents

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Document Status

Rev No.	Author(s)	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
A	R. Kochmanski	R. Creese		S Hoban		06/12/11

1. EXECUTIVE SUMMARY

A 21 tonne pilot plant program was conducted from July to Dec 2011 for Wolf Minerals Limited on their Hemerdon Tin / Tungsten project.

The Hemerdon Pilot Campaign and project Pre-Concentrate Flowsheet exceeded previous bench scale test work performance, verified the bulk of the Definitive Feasibility Study design criteria and bettered the market released expected project recoveries.

Key notes and outcomes of the pilot trial can be summarised as follows :

Sample selection

The treated sample did not exactly mirror the resource average of the project. The head grade received was deliberately chosen higher in order to provide a significant mass of pre-concentrate to better define and aid in the development of the final refining processes.

A direct correlation between some design criteria stream data and the pilot performance can not be made, mostly with respect to mass flow splits around the front end and final grades. The bulk of the unit operations are not sensitive to head grade however and the pilot performance is still a very good representation of recoveries and performances to be expected on the resource as a whole.

Some deleterious elements have been exacerbated in head grade compared to the resource average and includes previously unseen mineralogical species, this has created a good design basis for providing a robust refining process for the project overall.

Bulk sample preparation (crushing & Screening)

The Bulk handling and treatment of 20 tonnes through stage crushing at 80, 30 and 10mm has only yielded ~20 % of the feed material to the -0.5 mm fraction in comparison to the design of 48 % for “soft granite”.

The mass split at the front of the process is crucial in achieving tonnage throughput early in the project and avoiding “bottlenecking”, without incorporating massive over design. Much more mass has reported to the Dense Media Separation (DMS) Cyclones feed than was expected.

Hemerdon Concentrator Unit Operation Summary

All unit operations performed as expected or better than the bench scale test work. Main points of interest are :

The Primary DMS system is robust , highly effective and recovered 95 % of the total pre-concentrate product at a unit operation recovery of 98.15 %.

Desliming losses in the -63 um rejects acceptable at 2.51 % of total plant feed WO3 content.

Regrinding of the 3.3 SG Cleaner DMS overflow results in 43 % of the mass reporting to fines that requires recirculating back to the Deslime Feed.

The Scavenger DMS recovered a further 1.7 % WO3 at unit efficiency of 98 %. The necessity of this circuit depends on liberation mineralogy of the wolframite at -9mm across the resource. It is expected that the 3.3 SG Cleaner DMS cyclone will reject more wolframite in near SG material to overflow on the resource average material, increasing the Scavenger feed content.

The overall fines circuit recovered 22.5 % of the Rougher Spiral feed WO3 in one pass. 29.3 % of the recoverable WO3 content was lost in the combined rougher / scavenger spiral tail. This performance can ne improved upon by changing the operating philosophy around the spiral circuit and pulling more concentrate from the rougher spirals to the Cleaning Spiral circuit and increasing the recirculating load.

38 % of the Table circuit Feed was recovered in one pass with minimal upgrade observed across the cleaner and re-cleaner operations. Coarse and fines Tables should be investigated to improve the concentrate pull, reduce recirculating load and loss opportunity in this circuit.

Pre-concentrate performance

An overall recovery of 81.2% & 82.2% of WO_3/Sn was observed. The pre-concentrate grade was relatively high (50.5 % WO_3 & 5.78% Sn) however this was to be expected with such a relatively high head grade present in the feed.

The final arsenic grade was significant at 0.4% and a recovery from feed of 85.1 %.

Mineralogy

SEM analysis of the pre-concentrate was conducted. The results were similar to previous studies. The major variances were:

- Little evidence of “hematised Wolframite” was observed in the pilot bulk sample. The full extent of this in terms of the resource is not understood by IMO (ie how much of the resource is expected to have this “hematised Wolframite”).
- The arsenic was present as arsenopyrite & scorodite (a hydrated, oxidised ferric arsenate). The scorodite fraction is significant (~ 50 % of the arsenic mineralogy) thus arsenic removal by flotation alone will not achieve grade.

2. INTRODUCTION

The Hemerdon Tin / Tungsten project is located in the South West of England near the port city of Plymouth. The area has significant historical tungsten mining records from World War II and the 1980's AMEX pilot operation as well as current clay mining operations in existence.

Comprising a proven resource base of 23.5 Mt at grades of 0.19 % WO_3 and 0.03 % Sn, the Hemerdon Project stands to become a major contributor to the World tungsten market expecting 345,000 mt production of 65 % WO_3 concentrates per annum. Tin production is currently estimated at 462 tpa as a secondary bi-product.

DFS metal recoveries are reported at 66 % for tungsten and 64 % for tin.

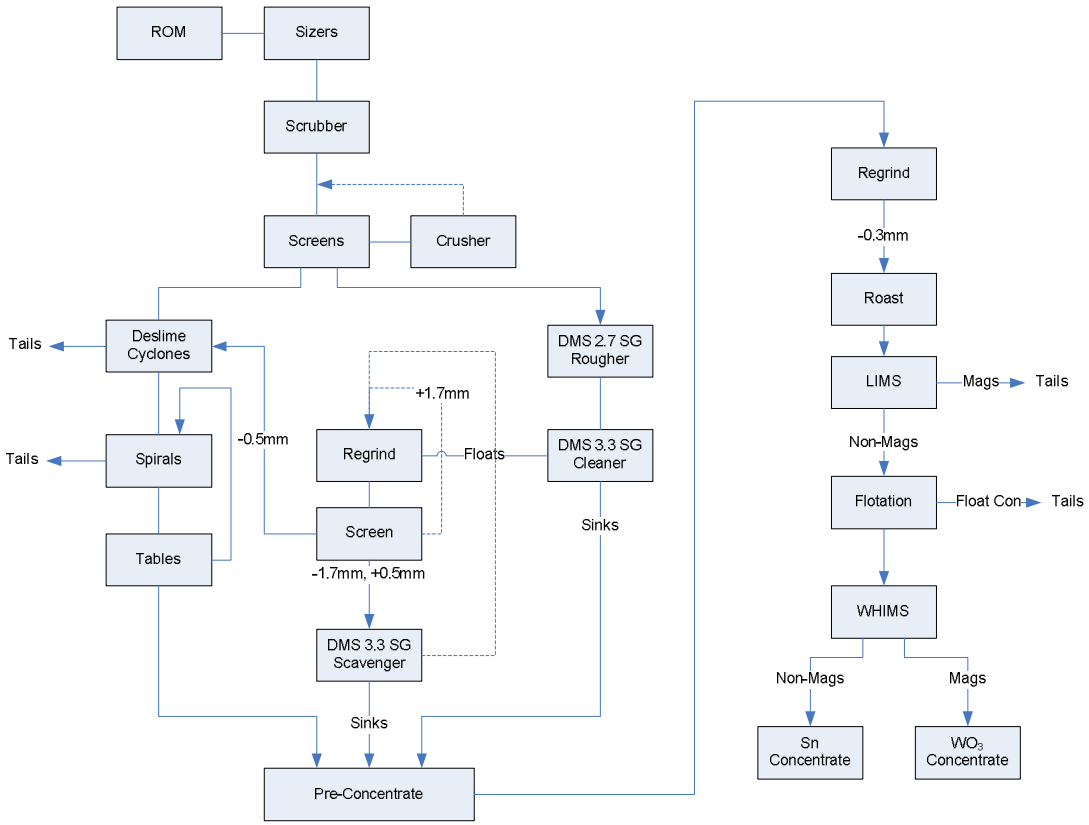
Wolf Minerals transported 52 tonnes of their as defined "Soft Granite "resource to Perth , Western Australia in June 2011. Nagrom laboratories embarked on a 20 t static pilot campaign to confirm / assess the Definitive Feasibility Study Flowsheet, Equipment Selection and Design Criteria.

Independent Metallurgical Operations Pty. Ltd. were engaged on the 7th July 2011 to manage the technical aspects of the program in conjunction with the clients aims of assessing the DFS process design by GR Engineering Services (GRES) and producing 10 kg of on specification marketable concentrate.

3. HEMERDON PROJECT DFS PROCESS BLOCK FLOW DIAGRAM

The DFS process flowsheet as depicted in Figure 1.

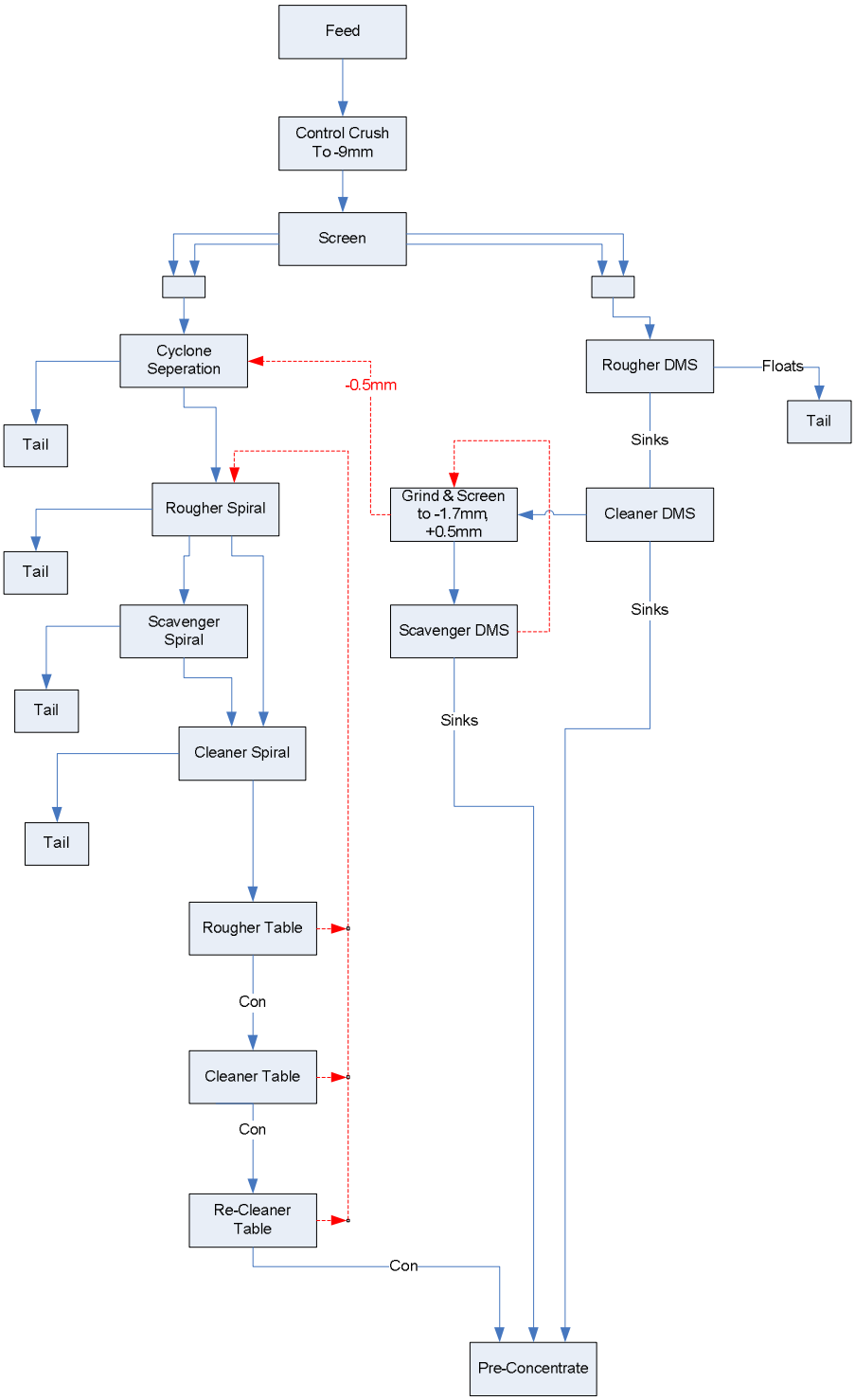
Figure 1 : Hemerdon DFS Process Block Flow Diagram



4. PILOT CAMPAIGN TESTWORK BLOCK FLOW DIAGRAM

The Soft Rock Pilot Campaign testwork flowsheet is as defined by Coffey Mining and summarised in Figure 2 below.

Figure 2: Pilot Campaign Testwork Program Block Flow Diagram



5. TESTWORK PROGRAM REPORTING

This report breaks the testwork findings down into unit operations as they appear in Figure 1 for ease of communication. The following unit operations will apply:

1) Project Bulk Sample Selection & Characterisation
2) Feed Preparation & Crushing
3) Primary Dense Media Separation (DMS) Circuit
4) Scavenger DMS Circuit
5) Deslime & Spiral Circuit
6) Table Circuit
7) Pre-concentrate Generation Summary (including Mineralogy)
8) Reverse Sulphide Flotation Process
9) Reduction Roasting
10) Magnetic Separation Circuit
11) Refining Summary (including Marketable Sample Specs.)
12) Tailings Treatment

5.1. Project Sample Selection & Characterisation

A random selection of 1 tonne bulka bags was taken from the as delivered 52 t to yield the 20700 kg that would comprise the Pilot Campaign Sample.

A reserve of 654 kg was retained for comparative assay and potential use if a significant mass loss occurred within the program.

Table 1 : Wolf Pilot Head Assays (%)

	WO_3	Sn	Fe_2O_3	MnO	SiO_2	Al_2O_3	As	CaO	MgO
Pilot Balance Calculated Head	**1.13**	**0.109**	**2.76**	**0.106**	**80.49**	**8.98**	**0.377**	**1.37**	**0.57**
Reserve Head	0.486	0.120	4.29	0.09	74.60	12.01	N/A	1.44	0.63
Pilot Head 1	0.644	0.148	3.31	0.07	74.00	12.45	0.42	1.40	0.56
Pilot Head 2	0.637	0.147	3.25	0.07	73.50	12.43	0.043	1.39	0.55
Design Criteria	0.190	0.035							

It is clear that Pilot Head 1 and 2 are representative of each other but in comparison to the reserve head grade some discrepancy exists. The full Pre-Concentrate Program back calculated head is utilised in this report for consistency. “Nugget” effects are commonly seen in this type of resource making coarse assaying inaccurate.

The pilot campaign head assay was significantly higher than the expected ore body average with 3-4 times higher WO_3 grades and 4-5 times for Tin. This was deliberately conducted in order to supply significant Pre-Concentrate mass to test and define the Refining Process.

Other pertinent feed information was an average of 3.9 % moisture and an ore specific gravity of 2.74.

Figure 1 : As received Wolf “Soft Granite” sample

As can be seen in Figure 1 above, a significant amount of coarse material (> 200 mm) was present within the sample.

5.2. Feed Preperation & Crushing

It must be noted that the Crushing and Feed Preparation could not be conducted as per the Process Design criteria due to size and equipment limitations.

The “as received” material had to be pre-screened in order to reduce the coarse material to a manageable particle size for further processing.

40.5 % of the feed was retained as +50 mm representing the mass that will report to the secondary crushing circuit whilst 59.5 % passed to the -50 mm fraction.

The coarse material was crushed through a jaw crusher with Closed Side Setting of 80 mm to give the pilot feed PSD of :

Table 2 : Pilot Feed Particle Size Distribution

Size Fraction	Mass %
+ 50 mm	2.43
-50 mm + 9.5 mm	27.00
-9.5 mm + 0.5 mm	44.22
- 0.5 mm	26.35

Figures 2 & 3 : + 9mm and – 9mm screened material respectively

The fines (-9.0 mm) were removed from the Primary Crushing pass, the coarse material was progressively stage crushed through 30 and finally 10mm.

Classification of sub 0.5 mm material was conducted at each stage using a vibrating single deck wet screen. The fines can be sub-split into the natural material from the “as received” sample and the fines generated through the stage crushing / coarse washing process.

The crushing and preparation program yielded total final masses of:

Table 3 : Crushing & Preparation Summary Table

	Mass (kg)	Mass %
Pilot Feed	20046	**100**
- 9mm to DMS Feed	16137	**80.5**
-0.5mm to Fines Circuit	3909	**19.5**
Natural Fines	2384.5	**61**
Crush Generated Fines	1524.5	**39**

The bulk of the testwork to date has been small scale which often misrepresents the large scale operation. The Bulk handling and treatment of 20 tonnes through stage crushing at 80, 30 and 10mm has only yielded ~20 % of the feed material to the -0.5 mm fraction in comparison to the design of 48 % for “soft granite”.

The mass split at the front of the process is crucial in achieving tonnage throughput early in the project and avoiding “bottlenecking”, without incorporating massive over design. Much more mass has reported to the DMS feed than was expected.

The crushing process only generated 7.5 % fines from the coarse feed.

5.3. Primary Dense Media Separation Circuit

5.3.1 SG 2.7 Primary DMS Cyclone

16.14 tonnes representing 80.5 % of the feed mass reported to the Primary DMS operating with a cut point 2.7 SG.

The Bulk Pilot Operation was conducted in a 250mm cyclone with 60 mm spigot operated at 20-22D (~100kPaG) pressure with 270D ferro-silicate media. The media was maintained at a SG of 2.7. The performance of the DMS operation is dictated by a number of factors including:

- Feed Particle Size Distribution
- % target mineral in fines
- % feed material near SG of cutpoint
- Media Stability
- Viscosity of feed

To preliminarily assess the performance a 10 kg "Sighter Run" was conducted to assess the performance of the Nagrom Unit. Heavy Liquid Separation (HLS) was conducted on the Sighter feed and products to analyse mass splits, misreporting material and generate a performance assessment (Washability curve).

The Pilot Performance is displayed below in Table 4, whilst the 10 kg sighter run and definitive HLS data can be seen in Appendix B – Nagrom test and assay data.

Table 4 : 2.7 Primary DMS Pilot Results

Stream (2.7 SG Primary DMS)	**Mass (kg)**	**Mass %**	**WO_3 grade %**	**WO_3 rec. %**	**Sn grade %**	**Sn Rec. %**
Pilot Primary DMS Feed	16137	100	1.22	100	0.11	100
Pilot DMS O/F	12848.3	79.62	0.07	1.12	0.01	2.70
Pilot DMS U/F	3288.7	20.38	6.44	98.88	0.40	97.30

The complete mass Balance for all other elemental / species examinations is in Appendix A – Wolf Pilot Campaign mass Balance.

The "Sighter" test yielded a similar result of 23.6 % of the mass reporting to underflow and 76.4 % to overflow.

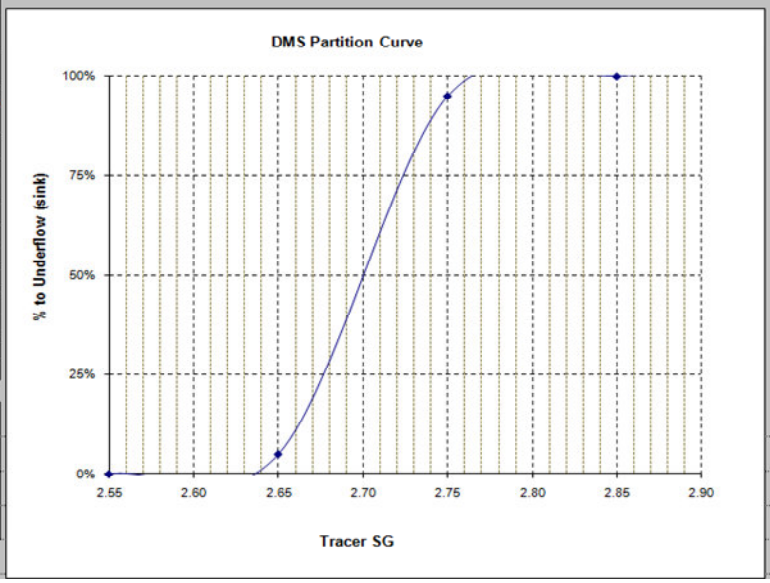
Heavy Liquid Separation is a pure test that shows the materials specific gravity difference across a certain target. There is no “perfect gravity” separator and a Dense Media Cyclone will characterise less effectively in the near zones of the target SG. As the target is 2.70 material from 2.65 to 2.70 should be modelled to the underflow fraction, and some 2.70 to 2.75 can be expected to be lost to the overflow. Other factors affecting the destination of a particle through a DMS separator are particle shape, porosity and size.

Figure 4 : 2.7 SG DMS Partition Curve

TRACER SIZE (mm)	6mm
Number of Tracers	20.00
START SG	2.55
INTERVAL	0.10

DMS Distribution (per SG)	# reporting to Underflow
2.55	
2.65	1
2.75	19
2.85	20
2.95	
3.05	
3.15	
3.25	
3.35	
3.45	
3.55	

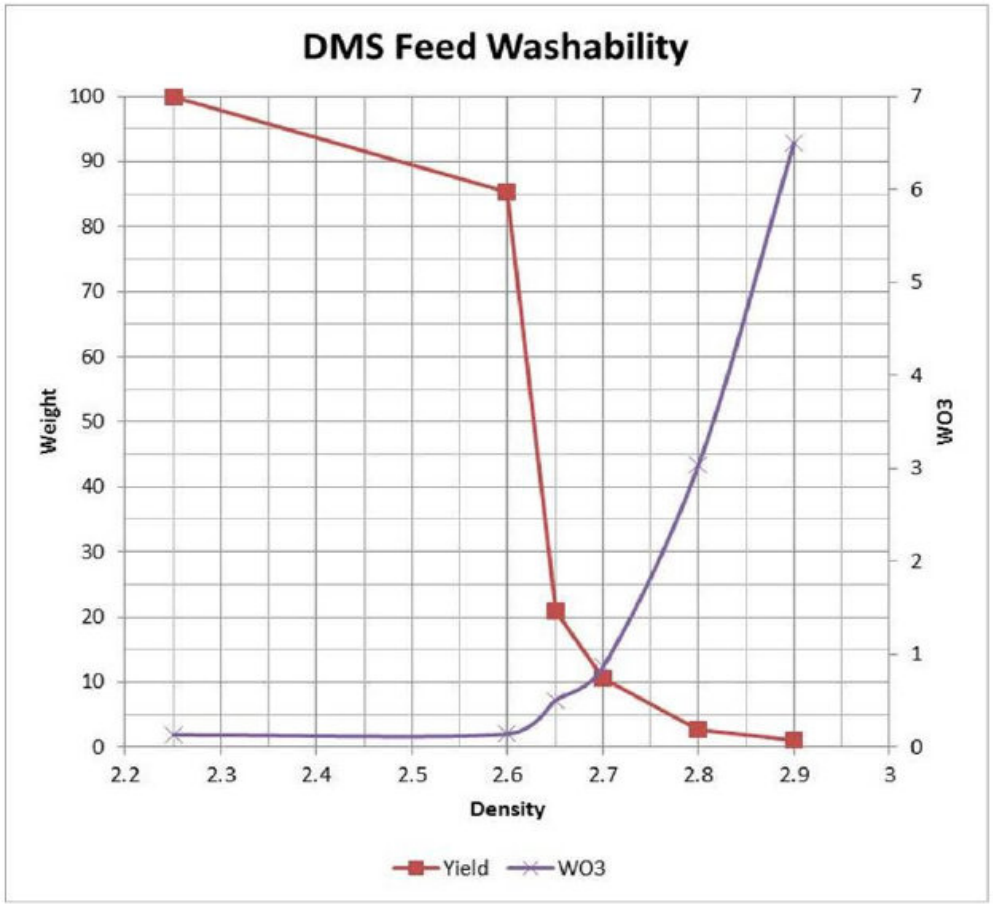
Enter intercept values	
75%	2.723
50%	2.700
25%	2.677



CYCLONE (diameter)	250mm
SPIGOT	60mm
MEDIA	250D
Controller Setting	2.29
FEED MEDIA Marcy (g/L)	2060
OVERFLOW MEDIA Marcy (g/L)	2050
UNDERFLOW MEDIA Marcy (g/L)	2290
CUT POINT	2.700

The Feed HLS separation yielded only 13.8 % mass to underflow and 86.3 % mass to overflow. This discrepancy can be displayed in a “Washability curve” that models the mass of misreporting near SG particles.

Figure 5: 2.7 SG Washability Curve



It can be seen the pilot performance and sighter test both reflect the Washability model for this material with both being slightly higher than 20 %.

The HLS data also shows 8 % of the mass loss to overflow is material of an SG greater than 2.70 and ~ 40 % of the metal loss incurred should be recovered in a perfect world.

Table 5 : 2.7 DMS Feed Particle Size & Grade Distribution

Size Fraction	Mass %	WO_3 Grade %	WO_3 dist %	Sn Grade %	Sn dist. %
Head	100	1.22	100	0.11	100
-9.5+ 6.3 mm	15.86	1.459	21.04	0.009	2.22
-6.3 + 3.35 mm	22.71	0.943	19.60	0.012	3.91
-3.35 + 2.0 mm	22.24	0.937	19.60	0.043	13.34
-2.0 + 1.18 mm	17.74	1.164	19.05	0.181	43.39
-1.18 + 0.85 mm	7.81	0.922	6.57	0.147	15.41
-0.85 + 0.5 mm	7.99	0.936	7.06	0.146	16.13
-0.5 mm	5.64	0.655	3.42	0.073	5.60

The above table highlights just how little of the target metal was present in potential loss streams.

5.3.2. SG 3.3 Cleaner DMS Cyclone

The 2.70 SG DMS Cyclone Underflow stream was re-treated through the same 250 mm diameter cyclone at target cut-point SG of 3.3, representing the Cleaner DMS operation.

Table 6 : 3.3 SG Cleaner DMS Performance

Stream (3.3 SG Cleaner DMS)	Mass (kg)	Mass %	WO_3 grade %	WO_3 rec. %	Sn grade %	Sn Rec. %
3.3 Cleaner DMS Feed	3291.7	100	6.44	100	0.11	100
Cleaner DMS O/F	2961.2	89.96	0.45	0.74	0.021	0.31
Cleaner DMS U/F	330.5	10.04	53.30	99.26	5.07	99.59

The operation was extremely difficult to control using only the 150D milled ferrosilicone. Atomised media (Cyclone 60) had to be included to maintain stability and for the operation to proceed. This required a ratio of 40/60 of 150D/atomised as the media.

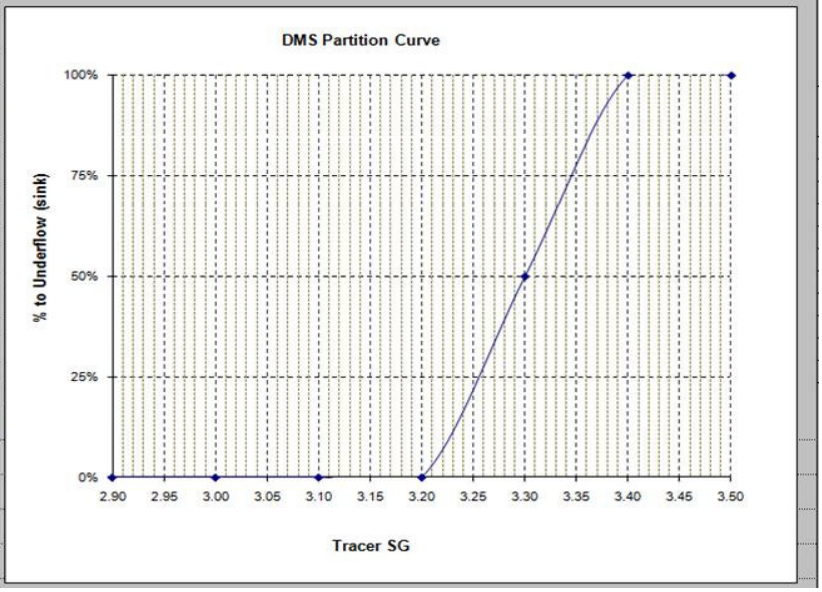
A similar HLS investigation highlights that the process was >98 % mass effective with an absolute minimum of material misreporting.

Figure 6 : 3.3 SG Cleaner DMS Partition Curve

TRACER SIZE (mm)	6mm
Number of Tracers	30.00
START SG	2.55
INTERVAL	0.10

DMS Distribution (per SG)	# reporting to Underflow
2.90	
3.00	
3.10	
3.20	0
3.30	15
3.40	30
3.50	
3.60	
3.70	
3.80	
3.90	

Enter intercept values	
75%	3.345
50%	3.300
25%	3.255



The Primary DMS circuit yielded excellent recoveries also at a high grade of 53.3 % WO_3. This represents 95.4 % of the total pre-concentrate production (in respect to WO_3).

Figure 7 : 3.3 SG Cleaner DMS Underflow for Refining

5.3.4 Scavenger DMS Cycloning

The 3.3 SG Cleaner DMS overflow was ground to 100 % passing 1.7 mm using a rod mill in closed circuit with a Kason Screen. This ground product was re-screened at 500 um to remove the generated fines.

Table 7 : 3.3 SG Overflow Grind Products

	Mass (kg)	Mass %
Mill Feed	2295.6	100
-1.7 + 0.5 mm	1306.8	56.93
-0.5 mm	988.8	43.07

The minus 500 um material contained grades of 0.65 % WO_3 and 0.054 % Sn for recycle to the Fines circuit. The program schedule did not allow for waiting for this generated material to be incorporated to the fines circuit feed. It has been assumed that the overall fines circuit performance can be applied to this stream for overall recovery estimate purposes. This material represents 2.84 % of the total plant feed WO_3 content.

Figure 8 : Continuous classification at 1.7mm post milling

The Scavenging operation was conducted in a smaller diameter unit of 120 mm and spigot of 24 mm due to the reduced mass. Cyclone 40 media was utilised in the trial.

Table 8 : Scavenger DMS Performance Data

Stream **(3.3 SG Scavenger DMS)**	**Mass** **(kg)**	**Mass %**	**WO_3 grade** **%**	**WO_3 rec.** **%**	**Sn grade** **%**	**Sn Rec.** **%**
3.3 Scavenger DMS Feed	1262.5	100	6.44	100	0.11	100
Scavenger DMS O/F	1254.4	99.36	0.10	0.10	0.009	1.72
Scavenger DMS U/F	8.13	0.64	28.80	98.68	2.38	98.28

Figures 9 & 10 : Scavenger DMS Products (O/F & U/F respectively)

The Mass Balance yields 10.85 kg production at 28.80 % from this circuit representing 1.7 % of recovered WO_3.

5.4 Deslime & Spiral Circuit

5.4.1 De-slime cyclone

The material from the crushing and screening process that comprised the -500 um material was passed through a 4" Cavex Warman cyclone with the aim of "desliming" the material at 63 um.

Table 9 : Deslime Cyclone Performance Data

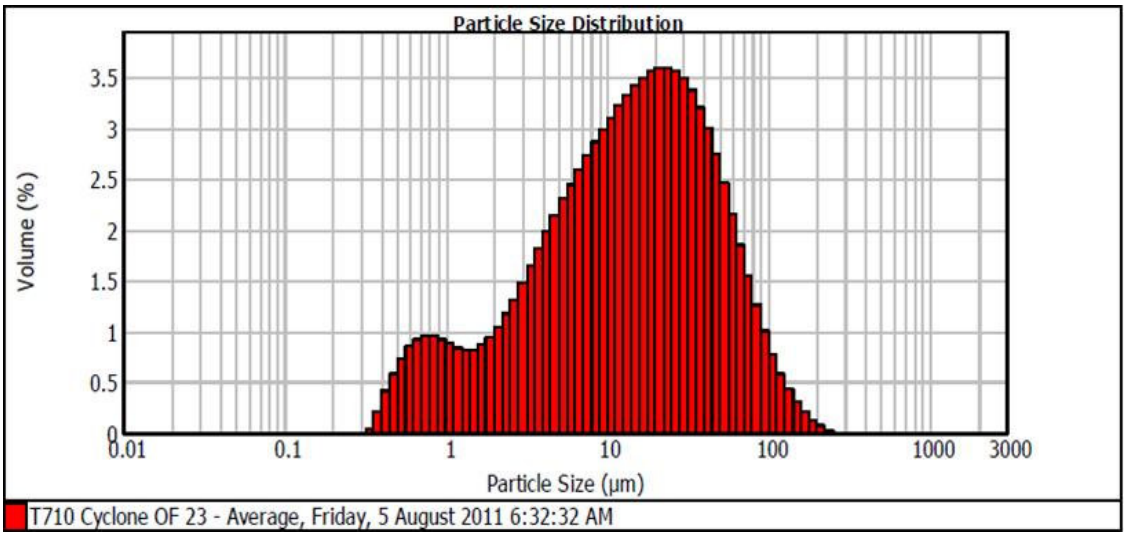
Stream Desliming	Mass (kg)	Mass %	WO_3 grade %	WO_3 rec. %	Sn grade %	Sn Rec. %
Deslime Feed	3899.5	100	0.64	100	0.46	100
Deslime O/F	902.04	23.13	0.63	29.00	0.021	11.38
Deslime U/F	2997.1	76.87	0.50	71.00	0.053	88.62

Desliming is critical in protecting the effectiveness of the gravity circuits (in particular the spirals) downstream.

The 29 % loss from fines through the de-slime process represents only represents 2.5 % of the total Tungsten entered in the feed.

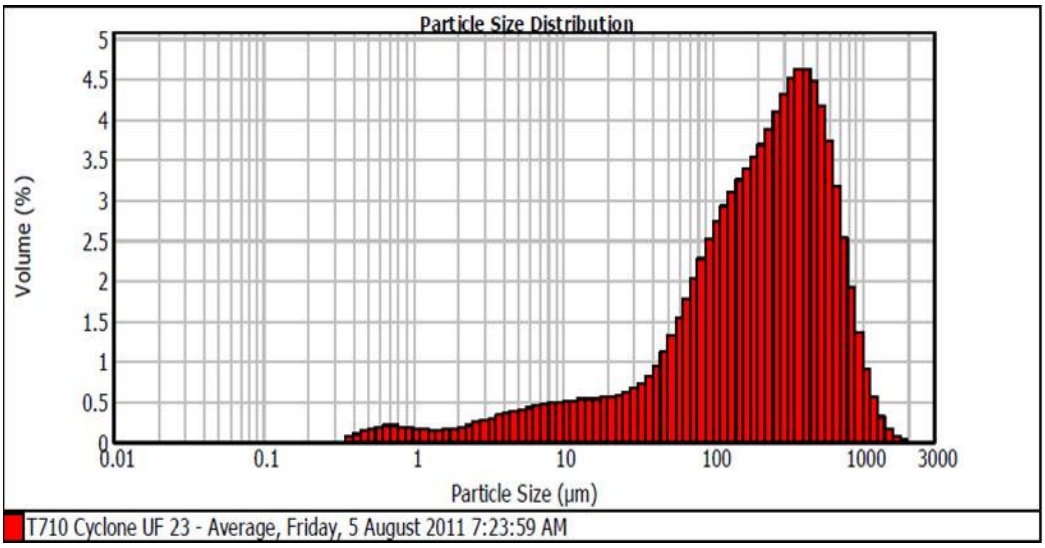
The operation was rigorously controlled and regularly checked via Malvern Laser Particle Sizing during the campaign.

Figure 11 : Overflow Product Sizing



The above graph highlights the cut point around 63 um and displays an incorporated rejection of ~ 6.3 % of the stream mass being particles larger than 63 um.

Figure 12 : Underflow Product Sizing



It can be seen that some fines and ultrafines are always going to pass to the underflow stream but with > 90 % comprising coarse particles the impact on the spiral performance is minimal.

5.4.2 Rougher Spirals

A CPG Mineral Technologies MG 6.3 spiral was selected for the roughing duty at 35 % solids feed density.

Table 10 : Rougher Spiral Performance

Unit Operation Rougher Spirals	Mass (kg)	Mass %	WO_3 grade %	WO_3 rec. %	Sn grade %	Sn Rec. %
Rougher Spiral Feed	2997.11	100	0.797	100	0.117	100
Concentrate	238.48	7.96	6.421	64.13	1.067	72.37
Middlings	443.61	14.80	0.616	11.44	0.063	7.89
Tails	2315.03	77.24	0.252	24.43	0.030	19.75

The representivity of subsamples assayed around this circuit were suspect. The discrepancy in assays from the deslime & rougher concentrate (particularly the Rougher concentrate grade) indicates a change in total metal of WO3 in the range of 300 %, ie generated mass of WO_3. The total metal did not deport through to further unit operations. The data displayed above is a corrected report back calculated from the final concentrate mass and grade.

A mass recovery of 60% of the WO_3 into 3% of the mass could not be achieved as per the DFS. It was visually noticed that this would be highly unlikely. A mass yield of ~10% to the concentrate was targeted and as can be seen above ~8% corresponds to this recovery.

There is a substantial amount of material reporting to the tails of the rougher spiral. A size by assay was conducted on the rougher tail.

Table 11 – Rougher Tails, Size by Assay

Size Fraction (mm)	Mass (%)	WO_3 (%)	Sn (%)
+0.5	10.36%	4.49%	5.37%
-0.5+0.355	12.65%	15.70%	10.73%
-0.355+0.212	19.44%	9.23%	13.75%
-0.212+0.150	18.93%	13.38%	18.75%
-0.150+0.090	19.50%	14.83%	22.07%
-0.09+0.063	10.46%	12.54%	16.27%
-0.063	8.66%	29.83%	13.06%

From the size by assay seen there is a significant proportion of the WO_3 generated in the -63µm fraction (the feed was “deslimed” at 63µm). The metal distribution of both the WO_3 & the Sn can be seen to be relatively uniformly distributed.

From the above results it would appear that more mass pull to the rougher concentrate would be preferable to increase the recovery. Judging from the Size by assay data a coarse and fines circuit could be beneficial, most likely separating at +300µm, -500µm.

5.4.3 Scavenger Spirals

The middlings recovered from the rougher spirals was fed to a MG 6.3 spiral for the scavenging circuit. The table below outlines the performance.

Table 12 – Scavenger Spiral Performance

Unit Operation	Mass (kg)	Mass %	WO_3 grade %	WO_3 rec. %	Sn grade %	Sn Rec. %
Scavenger Spiral Feed	443.61	100	0.616	100	0.063	100
Concentrate	31.91	7.19	4.130	48.25	0.575	66.11
Middlings	53.15	11.98	0.467	9.09	0.042	8.04
Tails	358.55	80.83	0.325	42.66	0.020	25.84

There is some upgrade however the recovery is relatively low. The DFS defines this circuit to achieve a 70 recovery to the concentrate with a mass yield of 20%. Clearly this has not been achieved in regards to WO3 with a loss of 42% WO3 to the tailings. This is to be expected.

Without size by size assays conducted on the rougher middlings, or the scavenger tails, it is difficult to attribute the large losses here seen. Due to the significant losses noticed in the -63µm fraction in the rougher tailings it would be expected that there could be a significant proportion of -63µm that would make separation inefficient.

With the separation seen in the rougher spirals there is little upgrade in the middlings fraction. This makes the material relatively difficult to separate and passing it through the same spiral will have little effect, the material needs to be presented differently to the unit operation. Potentially removing any -63µm material would be a good starting point. Reducing the size range of material and possibly treating a coarse and fines fraction would be preferable to improve performance.

Fines generation, in this case -63µm has been identified in previous work to drastically impact upon the rheology of the process flowsheet, is unavoidable when dealing with wolfram minerals. There is a tendency for them to be quite friable.

5.4.4 Cleaner Spirals

The rougher concentrate & scavenger concentrate material was combined and passed through the MG 6.3 spiral. The follows results were obtained.

Table 13 – Cleaner Spiral Performance

Unit Operation	**Mass (kg)**	**Mass %**	**WO_3 grade %**	**WO_3 rec. %**	**Sn grade %**	**Sn Rec. %**
Cleaner Spiral Feed	270.38	100	6.150	100	1.009	100
Concentrate	39.63	14.66	35.658	84.98	6.388	92.78
Middlings	42.87	15.86	0.959	2.47	0.078	1.22
Tails	187.88	69.49	1.110	12.54	0.087	6.00

As can be seen there is significant upgrade & recovery to the concentrate. The figures above are taken from the mass balance figures. The mass split to the concentrate is slightly higher than specified in the DFS, however the apparent upgrading achieved is significant.

5.5 Tables Circuit

5.5.1 Rougher Table

The cleaner concentrate material was fed to a wet table. For the rougher table a mass pull of 40% to the concentrate was targeted.

Table 14 – Rougher Table Performance

Unit Operation	Mass (kg)	Mass %	WO_3 grade %	WO_3 rec. %	Sn grade %	Sn Rec. %
Rougher Table Feed	39.63	100	35.66	100	6.39	100
Concentrate	17.86	45.06	51.66	65.28	9.51	67.11
Middlings	6.03	15.22	40.03	17.09	7.16	17.07
Tails	15.74	39.71	15.82	17.62	2.54	15.82

The material has been upgraded however the recoveries of 65.3% WO3 and 67.1% for WO3 and Sn respectively are lower than expected at the mass yield observed. An 85% recovery of WO_3 & Sn has been stated in the DFS for the rougher tables at a mass pull of 50%. Potential exists to improve this recovery downstream by targeting specific size fractions.

5.5.2 Cleaner Table

The concentrate obtained from the rougher table was fed through again to the cleaner table.

Table 15 – Cleaner Table Performance

Unit Operation	**Mass (kg)**	**Mass %**	**WO_3 grade %**	**WO_3 rec. %**	**Sn grade %**	**Sn Rec. %**
Cleaner Table Feed	17.86	100	51.66	100	9.51	100
Concentrate	12.39	69.35	55.96	75.12	10.76	78.40
Middlings	3.00	16.78	44.85	13.45	7.51	13.24

Tails	2.48	13.87	38.43	11.88	5.73	8.36

There appears to be no significant upgrading of material. The pattern of the metal recovery being closely associated with overall mass flow suggests little concentration and more of a “mass splitter” effect.

The most likely way to improve the recovery of this setup would be to segregate middlings & tails into a fines & coarse circuit for tabling as there is still a significant component in the tailings stream.

5.5.3 Re-cleaner Table

The product from the cleaner table was fed to the re-cleaner tables.

Table 15 – Re-cleaner table performance

Unit Operation	Mass (kg)	Mass %	WO_3 grade %	WO_3 rec. %	Sn grade %	Sn Rec. %
Re-Cleaner Table Feed	12.39	100	55.96	100	10.76	100
Concentrate	9.27	74.82	57.60	77.01	11.30	78.60
Middlings	1.81	14.62	52.00	13.59	10.10	13.73
Tails	1.31	10.56	49.80	9.40	7.81	7.67

Little concentration was observed with the recovery of metals corresponding to their subsequent mass splits.

5.6 Pre-Concentrate Generation Summary

The pre-concentrate generated from the pilot program is shown below.

Figure 13 – Pre-concentrate

The assay of the pre-concentrate is shown below.

Table 16 – Pre-concentrate Assay

	Weight	WO_3	Sn	Fe2O3	MnO	SiO2	Al2O3
	Kg	%	%	%	%	%	%
Pre-concentrate	271.9	50.50	5.78	20.30	3.39	15.20	1.22

	TiO2	CaO	MgO	As	U	Th
	%	%	%	%	ppm	ppm
Pre-concentrate	0.23	0.31	0.2	0.4	10	16

The grade of WO_3 is higher than stated in the DFS (50.50 vs 35.88), however this is to be expected due to significant higher head grade. The Sn grade is lower than previously estimated (5.78% vs 7.50%), this appears to be primarily influenced by the lack of upgrade in the coarse circuit (cleaner DMS). With a significantly higher head grade, in beneficiation unit operations a decrease in concentrate upgrade should be seen but with a higher grade produced. This can be attributed to the

variance of mass pull seen (20% vs 10.5%, 10% vs 4%) in the both the Primary & Secondary DMS (Rougher & Cleaner).

The arsenic grade is significant requiring ~85% removal of the arsenic to achieve an acceptable saleable product.

Uranium & Thorium were originally a concern, as they were assumed to concentrate with the heavier minerals, however as can be seen the concentration in the quite low. A concentrate of with less than 100ppm (total U & Th) is a typical required .

5.6.1 Observed recovery

From the data obtained from the Pilot Program a mass balance was developed. This is shown in Appendix A. The following table gives a summary of the performance of the streams (as per Appendix A)

Table 17 – Stream Recovery relative to feed

Recovery (relative to Feed)			
	Mass	WO3	Sn
Stream No	%	%	%
Feed			
1	100.00%	100.00%	100.00%
4+6	19.45%	13.00%	16.82%
3+5	80.55%	87.00%	83.18%
Fine Circuit (-0.5mm)			
15	4.50%	2.49%	0.82%
16	14.95%	10.51%	16.00%
17	11.55%	2.57%	3.16%
18	2.21%	1.20%	1.26%
19	1.19%	6.74%	11.58%
20	1.79%	0.51%	0.33%
21	0.27%	0.11%	0.10%
22	0.16%	0.58%	0.83%
23	0.94%	0.92%	0.74%
24	0.21%	0.18%	0.15%
25	0.20%	6.22%	11.52%
26	0.08%	1.10%	1.82%
27	0.03%	1.06%	1.97%
28	0.09%	4.06%	7.73%
29	0.01%	0.42%	0.65%
30	0.01%	0.59%	1.02%
31	0.06%	3.05%	6.06%
32	0.01%	0.29%	0.46%
33	0.01%	0.41%	0.83%
34	0.05%	2.35%	4.76%
Coarse Circuit (+0.5mm, -9mm)			
7	64.13%	3.69%	3.87%
8	16.42%	83.31%	79.31%
9	14.77%	5.80%	3.10%
10	1.65%	77.52%	76.21%
11	6.36%	3.67%	1.08%
12	8.41%	2.13%	2.01%
13	8.35%	0.75%	0.84%
14	0.05%	1.38%	1.18%
Pre-concentrate			
35	1.75%	81.24%	82.15%

As can be seen the respective recoveries of WO_3 & Sn were determined to be 81.24% & 82.15%. The largest losses in terms of WO_3 & Sn were the rougher DMS floats and the undersize material from the regrind stage post cleaner DMS. However this material is currently returning to the fines circuit in the flowsheet. The deslime cyclone loss constitutes a 2.5% loss, however this is preferable rather than affecting the performance of the spiral circuits.

5.6.2 Recirculation of Tabling Mids fractions

The following performance has been estimated based upon the current mass balance. This assumes that the material returned will behave in the same fashion as the feed, and this is unlikey.

Table 18 – Stream recovery estimate, recirculating table mids

Recovery (relative to Feed)			
	Mass	WO_3	Sn
Stream No	(%)	%	%
1	100.00	100.00	100.00
4+6	19.45	13.00	16.82
3+5	80.55	87.00	83.18
Fine Circuit (-0.5mm)			
15	4.50	2.49	0.82
16	14.95	10.51	16.00
17	11.59	3.20	4.13
18	2.22	1.50	1.65
19	1.19	8.39	15.13
20	1.80	0.64	0.43
21	0.27	0.14	0.13
22	0.16	0.72	1.09
23	0.94	1.14	0.97
24	0.21	0.23	0.20
25	0.20	7.74	15.05
26	0.08	1.36	2.38
27	0.03	1.32	2.57
28	0.09	5.06	10.10
29	0.01	0.52	0.63
30	0.02	0.74	1.16
31	0.06	3.80	8.58
32	0.01	0.36	0.66
33	0.01	0.52	1.18
34	0.05	2.92	6.74
Coarse Circuit (+0.5mm, -9mm)			
7	64.13	3.69	3.87
8	16.42	83.31	79.31
9	14.77	5.80	3.10
10	1.65	77.52	76.21
11	6.36	3.67	1.08
12	8.41	2.13	2.01
13	8.35	0.75	0.84
14	0.05	1.38	1.18
Pre-concentrate			
35	1.75	81.82	84.13

With the above assumptions little improvement in the overall result would be observed. This is not unexpected as the bulk of the recovery (95%) is observed

from the “coarse circuit”. There are slight increases however these are overshadowed by the coarse circuit.

5.6.3 Incorporation of Grind Fines

As per above, the performance was estimated with the addition of recirculating the screen undersize from the DMS regrind. The previous return of middlings material is included. This essentially assumes that the generated -0.5mm material will have a similar size distribution to that observed in the front end.

Table 19 – Estimated Stream Recovery, recirculating grind fines

Recovery (relative to Feed)			
	Mass	WO_3	Sn
Stream No	(%)	%	%
1	100.00	100.00	100.00
4+6	19.45	13.00	16.82
3+5	80.55	87.00	83.18
Fine Circuit (-0.5mm)			
15	7.89	3.30	0.89
16	26.21	13.92	17.41
17	20.32	4.23	4.49
18	3.89	1.98	1.80
19	2.09	11.11	16.47
20	3.15	0.85	0.46
21	0.47	0.18	0.14
22	0.28	0.96	1.19
23	1.65	1.51	1.06
24	0.38	0.30	0.22
25	0.35	10.26	16.38
26	0.14	1.81	2.59
27	0.05	1.75	2.80
28	0.16	6.70	10.99
29	0.02	0.69	0.68
30	0.03	0.98	1.26
31	0.11	5.03	9.33
32	0.01	0.47	0.72
33	0.02	0.68	1.28
34	0.08	3.87	7.34
Coarse Circuit (+0.5mm, -9mm)			
7	64.13	3.69	3.87
8	16.42	83.31	79.31
9	14.77	5.80	3.10
10	1.65	77.52	76.21
11	14.65	4.22	1.49
12	19.36	2.44	2.76
13	19.23	0.86	1.15
14	0.12	1.58	1.61
Pre-concentrate			
35	1.85	82.97	85.16

As can be seen there is a 1% & 2% improvement recovery in terms of the WO_3 & Sn.

5.7 Mineralogy

A sample of the pre-concentrate was split off and sent for mineralogical analysis (these are attached in appendix C) to Roger Townend. This sample was split out prior to grinding down to 300µm.

Wolframite

The following was observed for the Tungsten bearing minerals

- The material present that was -300µm was predominately well liberated. The wolfram:hubnerite ratio was 65:35
- Minor proportion of Wolfram has complex intergrowth textures with goethite. This proportion is not likely to be recoverable by magnetic separation (~10%)
- Rare evidence of “hematised” Wolframite. This should reduce the need for roasting for this feed stock

Tin

- Cassiterite appeared to be mostly liberated with some material +3mm hosting subordinate Wolfram.

Arsenic

- Minerals present are arsenopyrite & scorodite. There is a significant proportion of scorodite. This poses issues with arsenic removal due to the oxide nature of the mineral (will not float).

Iron

- Most iron compounds are separate from the Wolfram (goethite, hematite, magnetite, ilmentite, minor pyrite)

Appendix A

Wolf Pilot Mass Balance Data

Appendix B

Nagrom Test Sheets

Appendix C

Mineralogical Reports

APPENDIX 3C-14

NICNAS

Sodium Ethyl Xanthate

Priority Existing Chemical

Secondary Notification Assessment Report No.5S

APPENDIX 3C-15

Celanese

Safety data sheet – Methyl isobutyl carbinol

Safety data sheet
according to regulation (EC) Nr. 1907/2006

Product name	Methyl isobutyl carbinol		EU/EN
MSDS number	80063	**Revision Date**	Oct.29.2012
Revision Number	3.01	**Issuing date**	Oct.29.2012***

1. Identification of the substance/mixture and of the company/undertaking

Product name

Methyl isobutyl carbinol

REACH Registration Number
01-2119473979-13-0002

End Use:
Solvent

Manufacturer, importer, supplier
Celanese Chemicals Europe GmbH
Frankfurter Str. 111
D-61476 Kronberg/Ts.
Germany

Product Information
PS.Chemicals.EU@celanese.com

Emergency telephone number
+49 (0)69-305 6418

2. Hazards identification

Classification according to Regulation 1272/2008/EC (CLP)

Basis for Classification This substance is classified based on Directive 1272/2008/EC and its amendments (CLP Regulation, GHS).

Classification

Hazards	**Category**
Flammable liquid	Category 3
Serious eye damage/eye irritation	Category 2
Specific target organ systemic toxicity (single exposure)	Category 3

Symbol(s)

Signal Word **Warning**

Hazard Statements
H226 - Flammable liquid and vapor
H319 - Causes serious eye irritation
H335 - May cause respiratory irritation

Precautionary Statements

P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P235 - Keep cool
P240 - Ground/bond container and receiving equipment
P241 - Use explosion-proof electrical/ ventilating/ lighting/ equipment
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge
P261 - Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray
P264 - Wash face, hands and any exposed skin thoroughly after handling
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower
P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P312 - Call a POISON CENTER or doctor/ physician if you feel unwell
P337 + P313 - If eye irritation persists: Get medical advice/ attention
P370 + P378 - In case of fire: Use water spray for extinction
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up
P501 - Dispose of contents/container in accordance with local regulations.

Other Hazards

The substance does not meet the criteria for PBT / vPvB according to REACH, Annex XIII

Classification and labelling according to Directive 67/548/EWG or 1999/45/EC

Basis for Classification

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger

Flammable
Irritant

R-Phrase(s)

R10 - Flammable.
R36/37/38 - Irritating to eyes, respiratory system and skin.

S-Phrase(s)

S24/25 - Avoid contact with skin and eyes.

3. Composition/information on ingredients

Chemical characterization 4-Methyl-2-pentanol
Methylamyl alcohol
MIBC

Components	CAS-No	EC-No.	Identification Number	Percent %
4-Methylpentan-2-ol	108-11-2	203-551-7	603-008-00-8	min 99

Classification according to Regulations 67/548/EEC and 1272/2008/EC (CLP)

Components	67/548/EEC	1272/2008/EC (CLP)	Hazard Statements
4-Methylpentan-2-ol	R10 Xi, R36/37/38	Flammable liquid - Category 3 Serious eye damage / eye irritation - Category 2 STOT SE - Category 3	H226 H319 H335

4. First aid measures

General Information Remove contaminated, soaked clothing immediately and dispose of safely. Pay attention to own protection. In any case show the physician the Safety Data Sheet.

Inhalation Keep at rest. Move to fresh air. Call a physician immediately.

Skin Clean moistened skin with water and soap, preferentially with polyethylene glycol (Lutrol).. Obtain medical attention.

Eyes Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately.

Ingestion Rinse with plenty of water. If conscious, drink plenty of water. If swallowed, do not induce vomiting - seek medical advice.

Notes to physician

Main symptoms Vapours may cause irritation to the eyes, respiratory system and the skin, Inhalation of high vapour concentrations can cause CNS-depression and narcosis.

Treatment Treat symptomatically. In case of lung irritation first treatment with dexametason aerosol (spray). If ingested, irrigate the stomach using activated charcoal in addition. Administration of laxative agent is recommended after gastric lavage..

5. Firefighting measures

Suitable extinguishing media
Water spray, Dry powder, Carbon dioxide (CO2)

Extinguishing media which must not be used for safety reasons
Do not use a solid water stream as it may scatter and spread fire.

Special exposure hazards arising from the substance or preparation itself, its combustion products, or released gases
Vapors are heavier than air and may spread along floors
Vapors may spread long distances and ignite
Under conditions giving incomplete combustion, hazardous gases produced may consist of
Carbon oxides (COx)

Special protective equipment for fire-fighters
Wear self-contained breathing apparatus and protective suit.

Environmental precautions
Dike and collect water used to fight fire..

Other Information
Cool containers / tanks with water spray. Move containers from fire area if you can do it without risk.

6. Accidental release measures

Personal precautions
Avoid inhalation, ingestion and contact with skin and eyes. Keep away from heat and sources of ignition. Provide adequate ventilation.

Environmental precautions
Should not be released into the environment. Do not discharge into the drains/surface waters/groundwater. Prevent further leakage or spillage.

Methods for cleaning up
Remove all sources of ignition. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Dispose of in accordance with local regulations. Shovel or sweep up. Keep in suitable, closed containers for disposal.

Additional information
Consult trained personnel. Consider the information for "Personal Protection" in chapter 8 of this Safety Data Sheet.

7. Handling and storage

Handling

Hygiene measures
Avoid contact with the skin and the eyes. Avoid exposure to vapor. When using, do not eat, drink or smoke. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and immediately after handling the product. Clean skin thoroughly after work; apply skin cream .

Advice on safe handling
Use with adequate ventilation. Keep containers closed when not in use. Always open containers slowly to allow any excess pressure to vent. Avoid breathing vapor. Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Decontaminate soiled clothing thoroughly before re-use. Destroy contaminated leather clothing..

Incompatible products
strong oxidizing agents

Protection - fire and explosion:
Keep away from sources of ignition - No smoking. Take necessary action to avoid static electricity discharge. Ground and bond containers when transferring material. In case of fire, emergency cooling with water spray should be available.

Reduce the release of the substance or mixture to the environment
See Section 8: Environmental exposure controls

Temperature class
T2

Storage

Material storage
Store in a cool/low-temperature, well-ventilated, dry place away from heat and ignition sources. Take measures to prevent the build up of electrostatic charge.

Incompatible products
strong oxidizing agents

Technical measures/Storage conditions
Keep container tightly closed in a dry and well-ventilated place. Take measures to prevent the build up of electrostatic charge. Handle and open container with care.

German storage class
3A: Flammable liquids

8. Exposure controls / personal protection

EC Exposure Limit Values
No exposure limits established.

National occupational exposure limits (Germany)

Components	TRGS 900 (AGW)		STEL Factor
4-Methylpentan-2-ol	85 mg/m³	20 PPM	1

ACGIH Exposure Limits

Components	TWA
4-Methylpentan-2-ol	25 PPM

Components	STEL
4-Methylpentan-2-ol	40 PPM

DNELs
Acute - Systemic Effect

Worker (oral):	not required
Worker (dermal):	not required
Worker (inhalation):	208 mg/m³
General Population (oral):	not required
General Population (dermal):	not required
General Population (inhalation):	155.2 mg/m³

Acute - Local Effect

Worker (oral):	not required
Worker (dermal):	not required
Worker (inhalation):	104 mg/m³
General Population (oral):	not required
General Population (dermal):	not required
General Population (inhalation):	52.1 mg/m³

Long-term - Systemic Effects

Worker (oral):	not required
Worker (dermal):	11.8 mg/kg bw/d
Worker (inhalation):	83 mg/m³
General Population (oral):	4.2 mg/kg bw/d
General Population (dermal):	4.2 mg/kg bw/d
General Population (inhalation):	14.7 mg/m³

Long-term - Local Effects

Worker (oral):	not required
Worker (dermal):	not required
Worker (inhalation):	83 mg/m³
General Population (oral):	not required
General Population (inhalation):	14.7 mg/m³

PNECs

Environment (water):	0.6 mg/l
Environment (air):	not required
Environment (soil):	0.24 mg/kg soil dw
Environment (sediment):	2.94 mg/kg sediment dw
Environment (STP):	1 mg/l

Exposure controls

Engineering measures

General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred. Explosion-proof equipment (for example fans, switches, and grounded ducts) should be used in mechanical ventilation systems.

Personal protective equipment

General advice

Avoid contact with skin and eyes. Do not breathe vapors or spray mist. Use only in an area equipped with a safety shower. Hold eye wash fountain available.

Hygiene measures

Avoid contact with the skin and the eyes. Avoid exposure to vapor. When using, do not eat, drink or smoke. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and immediately after handling the product. Clean skin thoroughly after work; apply skin cream .

Respiratory protection

If aerosols or vapors are present, respiratory protection is required (gas filter A) . Full mask with above mentioned filter according to producers using requirements or self-contained breathing apparatus. Equipment should conform to EN 136 or EN 140 and EN 143.

Eye protection

safety glasses with side-shields Equipment should conform to EN 166

Skin protection

impervious clothing

Hand protection	Chemicals resistant gloves
Suitable material	Butyl-rubber
Type	Butoject (Company KCL) or comparable article; or refer to glove manufacturer's recommendation
Evaluation	according to EN 374: level 6
Material thickness	approx. 0.3 mm
Break through time	480 min
Suitable material	butyl-rubber
Type	Butoject (Company KCL) or comparable article; or refer to glove manufacturer's recommendation
Evaluation	according to EN 374: level 6
Material thickness	approx. 0.7 mm
Break through time	480 min

Environmental exposure controls
Do not discharge into the drains/surface waters/groundwater

Environmental Precautions
Should not be released into the environment

9. Physical and chemical properties

Appearance

Form	liquid
Color	colourless
Odor	mild

Odor Threshold	not determined
Molecular Weight	102.18 g/mol
Flash point	41°C
Method	open cup
Ignition temperature	335°C
Method	DIN 51794
Decomposition Temperature	not determined
Lower explosion limit	1 Vol. %
Upper explosion limit	5.5 Vol. %
Flammability (solids)	not applicable
Melting point/range	-90°C
Boiling point/range	131.6°C @ 1013 hPa
Density	0.808 g/ml @ 20°C
pH	not determined
Viscosity	4.074 mPa*s @ 25°C
Vapor pressure	3.7 hPa @ 20°C 34 hPa @ 50°C
Vapor density	3.52 (Air=1)
Evaporation Rate	0.26 (n-Butyl acetate = 1)
Water solubility	21.8 g/l @ 20°C
Solubility in other solvents	soluble in, Ethanol, Diethyl ether
Partition coefficient (n-octanol/water)	1.43 (measured)
Explosive Properties	not applicable based on consideration of the structure
Oxidizing Properties	not applicable based on consideration of the structure
Surface Tension	not determined
Dissociation constant	not determined

9. Physical and chemical properties

10. Stability and reactivity

Reactivity	Stable under normal conditions of handling, use and transportation.
Chemical Stability	No decomposition if stored and applied as directed.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Avoid contact with heat, sparks, open flame, and static discharge. Avoid any source of ignition.
Incompatible Materials	Keep away from:, strong oxidizing agents, strong acids
Hazardous decomposition products	Thermal decomposition giving flammable and toxic products: Organic vapours

11. Toxicological information

4-Methylpentan-2-ol

Acute oral toxicity	LD50: 2590 mg/kg
Species	rat
Method	OECD 401
Acute dermal toxicity	LD50: 2870 mg/kg
Species	rabbit
Method	OECD 402
Acute inhalation toxicity	LC50 (4h): > 16000 mg/m³
Species	rat
Method	OECD 403
Skin corrosion/irritation	irritating
Species	rabbit
Method	OECD 404
Serious eye damage/eye irritation	irritant
Species	rabbit eye
Method	OECD 405
Skin Sensitization	nonsensitizer
Species	guinea pig
Method	OECD 406
in vitro Mutagenicity	Ames Test: negative - with and without metabolic activation - Method: OECD 471 In vitro Mammalian Chromosome Aberration Test in rat cells: negative - without metabolic activation - Method: OECD 473 Saccharomyces cerevisiae, Gene Mutation Assay: negative with and without metabolic activation - Method: OECD480 Mouse lymphoma cell gene-mutation: negative - with and without metabolic activation - Method: OECD 476
Carcinogenic effects	No evidence of carcinogenicity

11. Toxicological information

Reproductive toxicity	No toxicity to reproduction (Reference substance: Methyl isobutyl ketone)
Routes of exposure	inhalation
Species	rat
Method	OECD 416
	NOAEL: 4093 mg/kg bw/day
Type of study	Two-generation study
Developmental effects	No teratogenetic, maternal or develomental effects
Routes of exposure	Inhalation
Species	rat, and, mouse
Method	OECD 414
	NOAEL: 4106 mg/kg bw/day
Type of study	Prenatal Developmental Toxicity Study
Developmental effects	No developmental or reproductive effects (Reference substance: 4-Hydroxy-4-methyl-2-pentanone)
Routes of exposure	oral gavage
Species	rat
Method	OECD 422
	NOAEL: 300 mg/kg bw/day
Type of study	Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test
Repeated exposure	No adverse effects. (Reference substance: Methyl isobutyl ketone).
Routes of exposure	Inhalation
Species	rat
Method	OECD 451
	NOAEC: 1840 mg/m³
Type of study	2-year chronic inhalation study
Repeated Exposure	No adverse effects
Routes of exposure	Inhalation
Species	rat
Method	OECD 412
	NOAEC: 3698 mg/m³
Type of study	28-day repeated administration toxicity test

12. Ecological information

4-Methylpentan-2-ol

Acute fish toxicity	LC50: > 92.4 mg/l (96h)
Species:	Pimephales promelas (Fathead minnow)
Method	OECD 203
Acute daphnia toxicity	EC50: 337 mg/l (48h)
Species:	Daphnia magna
Method	OECD 202
	NOEC (21 d): 30 mg/l (Reference substance: Methylisobutyl ketone)
Species:	Daphnia magna
Method	OECD 211
Toxicity to aquatic plants	EC50: 334 mg/l (96h)

12. Ecological information

Species:	Pseudokirchneriella subcapitata
Method	OECD 201
Toxicity to bacteria	EC50 (3h): > 100 mg/l
Species:	in activated sludge
Method	OECD 209
Biodegradation	Readily biodegradable 85 % (28d)
Method	OECD 301 F
Other potential hazards	The substance does not meet the criteria for PBT / vPvB according to REACH, Annex XIII

13. Disposal considerations

Product information	Disposal required in compliance with all waste management related state and local regulations. The choice of the appropriate method of disposal depends on the product composition by the time of disposal as well as the local statutes and possibilities for disposal.
Uncleaned empty packaging	Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.

14. Transport information

ADR/RID

UN/ID No.	UN 2053
Proper Shipping Name	Methyl isobutyl carbinol
Hazard Class	3
Classification Code	F1
Packing group	III
Environmentally hazardous	no
Tunnel Restriction Code	(D/E)
Hazard Label(s)	3
Hazard Number	30

ADNR ADNR: Container and Tanker

UN/ID No.	UN 2053
Proper Shipping Name	Methyl isobutyl carbinol
Hazard Class	3
Classification Code	F1
Packing group	III
Environmentally hazardous	no
Hazard Labels	3

ICAO/IATA

UN-No.	UN 2053
Proper Shipping Name	Methyl isobutyl carbinol
Hazard Class	3
Packing group	III

14. Transport information

Environmentally hazardous	no
Hazard Labels	3

IMDG

UN/ID No.	UN 2053
Proper Shipping Name	Methyl isobutyl carbinol
Hazard Class	3
Packing group	III
Marine pollutant	no
Hazard Labels	3
EmS Code	F-E, S-D

15. Regulatory information

Directive 1996/82/EC Annex I, part 2

Water Hazard Class (WGK):

WGK Class	1
WGK Reg. No.	5026
WGK Source	Classification according to VwVwS, Annex 3

International Inventories
Listed on the chemical inventories of the following countries or qualifies for an exemption:
Australia (AICS)
Canada (DSL)
China (IECSC)
Europe (EINECS)
Japan (ENCS)
Japan (ISHL)
Korea (KECI)
New Zealand (NZIoC)
Philippines (PICCS)
United States (TSCA)

Chemical Safety Assessment
Chemical Safety Assessment is available

Authorization - Reach Regulation, Title VII
This substance is not subject to authorization requirements

Restrictions - Reach Regulation, Titel VIII
This substance is not subject to restriction requirements

16. Other information

Other Information:
- Observe national and local legal requirements

Changes against the previous version are marked by ***

Training advice
Make sure that employees are aware of the hazards / risks as detailed on this Safety Data Sheet. When wearing a breathing apparatus, the need for appropriate training needs to be considered.

Sources of key data used to compile the datasheet
Information contained in this safety data sheet is based on Celanese owned data and public sources deemed valid or acceptable. The absence of data elements required by ANSI or 1907/2006/EC indicates that no data meeting these requirements is available.

Further information
This information is based on our present state of knowledge. It shall describe our products regarding safety requirements and shall not be construed as a guarantee or statement of condition and/or quality. For more information, other material safety data sheets or technical data sheets please consult the Celanese homepage (www.celanese.com).

Abbreviation and Acronym:
ADR = Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
CAS = Chemical Abstracts Service (division of the American Chemical Society)
CLP = Classification, Labelling and Packaging
DNEL = Derived No Effect Level
EINECS = European Inventory of Existing Commercial Chemical Substances
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC Code = International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IMO)
ICAO = International Civil Aviation Organization
IMDG = International Maritime Code for Dangerous Goods
LC50 = Lethal Concentration
LD50 = Lethal Dose
LOAEC = Low Observed Adverse Effect Concentration
LOAEL = Low Observed Adverse Effect Level
LOEL = Low Observed Effect Level
MEST = Mouse Ear Swelling Test
NOAEC = No Observed Adverse Effect Concentration
NOAEL = No Observed Adverse Effect Level
NOEC = No Observed Effect Concentration
NOEL = No Observed Effect Level
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RCR = Risk Characterization Ratio
RID = Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations
Concerning the International Transport of Dangerous Goods by Rail)
R-Phrases = Risk Phrases
S-Phrases = Safety Phrases
STOT RE = Specific Target Organ Toxicity Repeated Exposure
STOT SE = Specific Target Organ Toxicity Single Exposure
STP = Sewage Treatment Plant
vPvB = very Persistent and very Bioaccumulative

Annex: Exposure Scenario(s)

Exposure Scenarios are currently available in English only. Updates in local languages will be published as soon as they are available
See section 8: DNELs and PNECs

For industrial use only.
Please contact Celanese in case you are interested in consumer applications at REACH@celanese.com

Table of Contents

1. Formulation (SU 3); Distribution of substance

Title of Exposure scenario Formulation (SU 3); Distribution of substance

Environment: Distribution of substance ERC 2

Worker

General process exposures - closed process (e.g. In-line additive dosing equipment, in-line filter cleaning; pipeline transfers) PROC 1
General process exposures (occasional controlled exposure) PROC 2
General process exposures - closed batch process PROC 3
General exposures open batch process PROC 4
Sample collection PROC 3
Laboratory activities PROC 15
Bulk closed loading and unloading PROC 8b
Bulk open loading PROC 8b
Drum and small package filling PROC 9
Clean down and Maintenance PROC 8a
Storage PROC 2

2. Conditions of use affecting exposure

2.1 Control of environmental exposure: Distribution of substance (ERC 2)

Amounts used
Daily amount per site <= 1.8 tonnes/day
Annual amount per site <= 540 tonnes/year

Other given operational conditions affecting environmental exposure
Receiving river flow rate >= 1.8E4 m3/d

Conditions and measures related to municipal sewage treatment plant
Wastewater is to be treated by a municipal STP.
Municipal STP discharge rate < 2E3 m3/d

2.2 Control of workers exposure for General process exposures - closed process (e.g. In-line additive dosing equipment, in-line filter cleaning; pipeline transfers) (PROC 1)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed system. No contact to substance.

2.3 Control of workers exposure for General process exposures (occasional controlled exposure) (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

2.4 Control of workers exposure for General process exposures - closed batch process (PROC 3)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed batch process. All substance transfers closed. No regular manual interventions.

2.5 Control of workers exposure for General exposures open batch process (PROC 4)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed

Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed batch manufacturing process. No open substance transfers.

2.6 Control of workers exposure for Sample collection (PROC 3)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed batch process. All substance transfers closed. No regular manual interventions.

2.7 Control of workers exposure for Laboratory activities (PROC 15)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

2.8 Control of workers exposure for Bulk closed loading and unloading (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.

2.9 Control of workers exposure for Bulk open loading (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure

Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.

2.10 Control of workers exposure for Drum and small package filling (PROC 9)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Enclosed substance transfer points.

2.11 Control of workers exposure for Clean down and Maintenance (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.12 Control of workers exposure for Storage (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

3. Exposure estimation and reference to its source

Environment

Release route	**Release rate (kg/day)**	**Release estimation method**
Water	0.018	Other method - SPERC - ESVOC 3
Air	0.18	Other method - SPERC - ESVOC 3
Soil	0	Other method - SPERC - ESVOC 3

Protection target	**Exposure estimate** (based on: EUSES 2.0)	**RCR**
Freshwater (pelagic)	5.87E-4 mg/L	0.001
Freshwater (sediment)	0.003 mg/kg dw	0.001
Marine water (pelagic)	5.49E-5 mg/L	0.001
Marine water (sediment)	2.69E-4 mg/kg dw	0.001
Freshwater food chain (predators)	#	#
Marine water food chain (predators)	#	#
Marine water food chain (top predators)	#	#
Effluent	0.001 mg/L	0
Agricultural soil	4.71E-5 mg/kg dw	0
Terrestrial food chain (predator)	#	#

Not required as an accumulation via the food chain is not expected

Risk characterisation for man via the environment
Not required as an accumulation via the food chain is not expected

Worker exposure

Long-term, systemic

Contributing scenario: General process exposures - closed process (e.g. In-line additive dosing equipment, in-line filter cleaning; pipeline transfers) (PROC 1)
Inhalation: Exposure: 0.043 mg/m³ RCR: 5.181E-4
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.03
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: General process exposures (occasional controlled exposure) (PROC 2)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.168
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: General process exposures - closed batch process (PROC 3)
Inhalation: Exposure: 12.77 mg/m³ RCR: 0.154
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.183
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: General exposures open batch process (PROC 4)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Sample collection (PROC 3)
Inhalation: Exposure: 12.77 mg/m³ RCR: 0.154
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.183
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Laboratory activities (PROC 15)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.286
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Bulk closed loading and unloading (PROC 8b)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Bulk open loading (PROC 8b)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Drum and small package filling (PROC 9)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Clean down and Maintenance (PROC 8a)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.745
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.168
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Acute systemic
A risk characterisation for short term duration (short term event, peak exposure) was not conducted as an Acute toxicity hazard leading to classification & labelling has not been identified.

Local effects via inhalation route
For the acute exposure, no RCR values have been calculated as the risks resulting from short-term exposure are covered by the long-term assessment

Contributing scenario: General process exposures - closed process (e.g. In-line additive dosing equipment, in-line filter cleaning; pipeline transfers) (PROC 1)
Long term: Exposure: 0.043 mg/m³ RCR: 5.181E-4
Exposure estimation Method: Extended TRA workers

Contributing scenario: General process exposures (occasional controlled exposure) (PROC 2)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: General process exposures - closed batch process (PROC 3)
Long term: Exposure: 12.77 mg/m³ RCR: 0.154
Exposure estimation Method: Extended TRA workers

Contributing scenario: General exposures open batch process (PROC 4)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Sample collection (PROC 3)
Long term: Exposure: 12.77 mg/m³ RCR: 0.154
Exposure estimation Method: Extended TRA workers

Contributing scenario: Laboratory activities (PROC 15)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Bulk closed loading and unloading (PROC 8b)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Bulk open loading (PROC 8b)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Drum and small package filling (PROC 9)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Clean down and Maintenance (PROC 8a)
Long term: Exposure: 42.57 mg/m³ RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Local effects via dermal route
A DNEL for local effects of Acute Dermal exposure was not derived as an Acute toxicity hazard leading to classification & labelling has not been identified. For local effects of long-term Dermal exposure, a DNEL was not derived as there is no information available about threshold effects and/or dose-response. Consequently, RCR values were not calculated for both exposure patterns.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The Use Descriptors assigned based on the ECHA guidance on use descriptors R-12 represent the current understanding of the uses of our product

(http://echa.europa.eu/documents/10162/13632/information_requirements_r12_en.pdf).

Please carefully consider whether the listed Exposure Scenarios reflect your uses of Celanese's product. Different uses can be addressed in the same exposure scenario if the same operational conditions and risk management measures apply to all these uses. In addition, various types of activities can be expressed by one category for workers' exposure and one category for environmental exposure.
ECHA's "Guidance for Downstream Users" provides details how to decide whether or not your use is covered by the exposure scenarios and what to do if this is not the case

(http://echa.europa.eu/documents/10162/13634/du_en.pdf).

2. Formulation (SU 3); Formulation and repackaging

Title of Exposure scenario Formulation (SU 3); Formulation and repackaging

Environment: Formulation and repackaging ERC 2

Worker

General process exposures (no sampling) (e.g. In-line additive dosing equipment, in-line filter cleaning) PROC 1
General process exposures (no sampling) (e.g. In-line additive dosing equipment, in-line filter cleaning) PROC 2
General process exposures (e.g. In-line additive dosing equipment, in-line filter cleaning) PROC 3
General exposures open batch process PROC 4
Batch processes at elevated temperatures (e.g. solvents resin manufacture, grease manufacture) PROC 3
Sample collection PROC 3
Laboratory activities PROC 15
Bulk transfers PROC 8b
Mixing operations (open systems) PROC 5
Transfer from/pouring from containers , Manual PROC 8a
Drum/Batch transfers PROC 8b
Tabletting, compression, extrusion or pelletisation PROC 14
Drum and small package filling PROC 9
Clean down and Maintenance PROC 8a
Storage PROC 2

2. Conditions of use affecting exposure

2.1 Control of environmental exposure: Formulation and repackaging (ERC 2)

Amounts used
Daily amount per site <= 11.67 tonnes/day
Annual amount per site <= 3.5E3 tonnes/year

Other given operational conditions affecting environmental exposure
Receiving river flow rate >= 1.8E4 m3/d

Conditions and measures related to municipal sewage treatment plant
Wastewater is to be treated by a municipal STP.
Municipal STP discharge rate < 2E3 m3/d

2.2 Control of workers exposure for General process exposures (no sampling) (e.g. In-line additive dosing equipment, in-line filter cleaning) (PROC 1)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed system. No contact to substance.

2.3 Control of workers exposure for General process exposures (no sampling) (e.g. In-line additive dosing equipment, in-line filter cleaning) (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

2.4 Control of workers exposure for General process exposures (e.g. In-line additive dosing equipment, in-line filter cleaning) (PROC 3)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed batch process. All substance transfers closed. No regular manual interventions.

2.5 Control of workers exposure for General exposures open batch process (PROC 4)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed batch manufacturing process. No open substance transfers.

2.6 Control of workers exposure for Batch processes at elevated temperatures (e.g. solvents resin manufacture, grease manufacture) (PROC 3)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions a_d measures
Closed batch process. All substance transfers closed. No regular manual interventions.

2.7 Control of workers exposure for Sample collection (PROC 3)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed batch process. All substance transfers closed. No regular manual interventions.

2.8 Control of workers exposure for Laboratory activities (PROC 15)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

2.9 Control of workers exposure for Bulk transfers (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.

2.10 Control of workers exposure for Mixing operations (open systems) (PROC 5)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure

Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed mixing and blending of chemicals. No open substance transfers.

2.11 Control of workers exposure for Transfer from/pouring from containers , Manual (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.12 Control of workers exposure for Drum/Batch transfers (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.

2.13 Control of workers exposure for Tabletting, compression, extrusion or pelletisation (PROC 14)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

2.14 Control of workers exposure for Drum and small package filling (PROC 9)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Enclosed substance transfer points.

2.15 Control of workers exposure for Clean down and Maintenance (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.16 Control of workers exposure for Storage (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

3. Exposure estimation and reference to its source

Environment

Release route	Release rate (kg/day)	Release estimation method
Water	58.333	Other method - SPERC - ESVOC 4
Air	291.667	Other method - SPERC - ESVOC 4
Soil	0	Other method - SPERC - ESVOC 4

Protection target	**Exposure estimate** (based on: EUSES 2.0)	**RCR**
Freshwater (pelagic)	0.365 mg/L	0.608
Freshwater (sediment)	1.79 mg/kg dw	0.609
Marine water (pelagic)	0.036 mg/L	0.608
Marine water (sediment)	0.179 mg/kg dw	0.597
Freshwater food chain (predators)	#	#
Marine water food chain (predators)	#	#
Marine water food chain (top predators)	#	#
Effluent	3.64 mg/L	0.036
Agricultural soil	0.101 mg/kg dw	0.421
Terrestrial food chain (predator)	#	#

Not required as an accumulation via the food chain is not expected

Risk characterisation for man via the environment
Not required as an accumulation via the food chain is not expected

Worker exposure

Long-term, systemic

Contributing scenario: General process exposures (no sampling) (e.g. In-line additive dosing equipment, in-line filter cleaning) (PROC 1)
Inhalation: Exposure: 0.043 mg/m³ RCR: 5.181E-4
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.03
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: General process exposures (no sampling) (e.g. In-line additive dosing equipment, in-line filter cleaning) (PROC 2)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.168
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: General process exposures (e.g. In-line additive dosing equipment, in-line filter cleaning) (PROC 3)
Inhalation: Exposure: 12.77 mg/m³ RCR: 0.154
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.183
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: General exposures open batch process (PROC 4)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Batch processes at elevated temperatures (e.g. solvents resin manufacture, grease manufacture) (PROC 3)
Inhalation: Exposure: 12.77 mg/m³ RCR: 0.154
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.183
Exposure estimation Method: Inhal: Extended TRA work_rs Derm: Extended TRA workers

Contributing scenario: Sample collection (PROC 3)
Inhalation: Exposure: 12.77 mg/m³ RCR: 0.154
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.183
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Laboratory activities (PROC 15)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.286
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Bulk transfers (PROC 8b)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Mixing operations (open systems) (PROC 5)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232

Combined routes: RCR: 0.489
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Transfer from/pouring from containers , Manual (PROC 8a)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.745
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Drum/Batch transfers (PROC 8b)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Tabletting, compression, extrusion or pelletisation (PROC 14)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 3.429 mg/kg bw/day RCR: 0.291
Combined routes: RCR: 0.547
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Drum and small package filling (PROC 9)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Clean down and Maintenance (PROC 8a)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.745
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.168
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Acute systemic
A risk characterisation for short term duration (short term event, peak exposure) was not conducted as an Acute toxicity hazard leading to classification & labelling has not been identified.

Local effects via inhalation route
For the acute exposure, no RCR values have been calculated as the risks resulting from short-term exposure are covered by the long-term assessment.

Contributing scenario: General process exposures (no sampling) (e.g. In-line additive dosing equipment, in-line filter cleaning) (PROC 1)
Long term: Exposure: 0.043 mg/m³ RCR: 5.181E-4
Exposure estimation Method: Extended TRA workers

Contributing scenario: General process exposures (no sampling) (e.g. In-line additive dosing equipment, in-line filter cleaning) (PROC 2)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: General process exposures (e.g. In-line additive dosing equipment, in-line filter cleaning) (PROC 3)
Long term: Exposure: 12.77 mg/m³ RCR: 0.154
Exposure estimation Method: Extended TRA workers

Contributing scenario: General exposures open batch process (PROC 4)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Batch processes at elevated temperatures (e.g. solvents resin manufacture, grease manufacture) (PROC 3)
Long term: Exposure: 12.77 mg/m³ RCR: 0.154
Exposure estimation Method: Extended TRA workers

Contributing scenario: Sample collection (PROC 3)
Long term: Exposure: 12.77 mg/m³ RCR: 0.154
Exposure estimation Method: Extended TRA workers

Contributing scenario: Laboratory activities (PROC 15)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Bulk transfers (PROC 8b)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Mixing operations (open systems) (PROC 5)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Transfer from/pouring from containers , Manual (PROC 8a)
Long term: Exposure: 42.57 mg/m³ RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Drum/Batch transfers (PROC 8b)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Tabletting, compression, extrusion or pelletisation (PROC 14)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Drum and small package filling (PROC 9)

Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Clean down and Maintenance (PROC 8a)
Long term: Exposure: 42.57 mg/m³ RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Local effects via dermal route
A DNEL for local effects of Acute Dermal: exposure was not derived as an Acute toxicity hazard has not been identified. For local effects of long-term Dermal: exposure, a DNEL was not derived as there is no information available about threshold effects and/or dose-response. Consequently, RCR values were not calculated for both exposure patterns.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
The Use Descriptors assigned based on the ECHA guidance on use descriptors R-12 represent the current understanding of the uses of our product

(http://echa.europa.eu/documents/10162/13632/information_requirements_r12_en.pdf).

Please carefully consider whether the listed Exposure Scenarios reflect your uses of Celanese's product. Different uses can be addressed in the same exposure scenario if the same operational conditions and risk management measures apply to all these uses. In addition, various types of activities can be expressed by one category for workers' exposure and one category for environmental exposure.
ECHA's "Guidance for Downstream Users" provides details how to decide whether or not your use is covered by the exposure scenarios and what to do if this is not the case

(http://echa.europa.eu/documents/10162/13634/du_en.pdf).

3. Industrial end-use (SU 3); Use in coatings; Coatings; PC 9a

Title of Exposure scenario Industrial end-use (SU 3); Use in coatings; Coatings; PC 9a

Environment: Use in coatings ERC 4

Worker

General exposures (closed systems) PROC 1
General exposures (closed systems). with sample collection. Use in contained systems PROC 2
Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB radiation curing PROC 2
Mixing operations (closed systems). General exposures (closed systems). PROC 3
Film formation - air drying PROC 4
Preparation of material for application. Mixing operations (open systems) PROC 5
Spraying (automatic/robotic) PROC 7
Manual Spraying PROC 7
Material transfers PROC 8a
Material transfers PROC 8b
Roller, spreader, flow application PROC 10
Dipping, immersion and pouring PROC 13
Laboratory activities PROC 15
Material transfers. Drum/batch transfers. Transfer from/pouring from containers PROC 9
Production or preparation or articles by tabletting, compression, extrusion or pelletisation. PROC 14

2. Conditions of use affecting exposure

2.1 Control of environmental exposure: Use in coatings (ERC 4)

Amounts used
Daily amount per site <= 4.74 tonnes/day
Annual amount per site <= 1.42E3 tonnes/year

Other given operational conditions affecting environmental exposure
Receiving river flow rate >= 1.8E4 m3/d

Conditions and measures related to municipal sewage treatment plant
Wastewater is to be treated by a municipal STP.
Municipal STP discharge rate < 2E3 m3/d

2.2 Control of workers exposure for General exposures (closed systems) (PROC 1)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed system. No contact to substance.

2.3 Control of workers exposure for General exposures (closed systems). with sample collection. Use in contained systems (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

2.4 Control of workers exposure for Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB radiation curing (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

2.5 Control of workers exposure for Mixing operations (closed systems). General exposures (closed systems). (PROC 3)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed batch process. All substance transfers closed. No regular manual interventions.

2.6 Control of workers exposure for Film formation - air drying (PROC 4)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature

Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially _losed batch manufacturing process. No open substance transfers.

2.7 Control of workers exposure for Preparation of material for application. Mixing operations (open systems) (PROC 5)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed mixing and blending of chemicals. No open substance transfers.

2.8 Control of workers exposure for Spraying (automatic/robotic) (PROC 7)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands and upper wrists (1500 cm2)

Technical and organisational conditions and measures
Spraying in confined area with mechanical barriers.
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 95% ; Dermal: 95%]

2.9 Control of workers exposure for Manual Spraying (PROC 7)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands and upper wrist_ (1500 cm2)

Technical and organisational conditions and measures
Spraying in confined area with mechanical barriers.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better. Effectiveness >=90%

2.10 Control of workers exposure for Material transfers (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.11 Control of workers exposure for Material transfers (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.

2.12 Control of workers exposure for Roller, spreader, flow application (PROC 10)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.13 Control of workers exposure for Dipping, immersion and pouring (PROC 13)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 95%]

2.14 Control of workers exposure for Laboratory activities (PROC 15)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

2.15 Control of workers exposure for Material transfers. Drum/batch transfers. Transfer from/pouring from containers (PROC 9)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Enclosed substance transfer points.

2.16 Control of workers exposure for Production or preparation or articles by tabletting, compression, extrusion or pelletisation. (PROC 14)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

3. Exposure estimation and reference to its source

Environment

Release route	**Release rate (kg/day)**	**Release estimation method**
Water	94.8	Other method - SPERC - ESVOC 5
Air	464.52	Other method - SPERC - ESVOC 5
Soil	0	Other method - SPERC - ESVOC 5

Protection target	**Exposure estimate** (based on: EUSES 2.0)	**RCR**
Freshwater (pelagic)	0.593 mg/L	0.988
Freshwater (sediment)	2.9 mg/kg dw	0.986
Marine water (pelagic)	0.059 mg/L	0.988
Marine water (sediment)	0.29 mg/kg dw	0.967
Freshwater food chain (predators)	#	#
Marine water food chain (predators)	#	#
Marine water food chain (top predators)	#	#
Effluent	5.92 mg/L	0.059
Agricultural soil	0.163 mg/kg dw	0.679
Terrestrial food chain (predator)	#	#

Not required as an accumulation via the food chain is not expected

Risk characterisation for man via the environment
Not required as an accumulation via the food chain is not expected

Worker exposure

Long-term, systemic

Contributing scenario: General exposures (closed systems) (PROC 1)
Inhalation: Exposure: 0.043 mg/m³ RCR: 5.181E-4
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.03
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: General exposures (closed systems). with sample collection. Use in contained systems (PROC 2)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.168
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB radiation curing (PROC 2)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.168
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Mixing operations (closed systems). General exposures (closed systems). (PROC 3)
Inhalation: Exposure: 12.77 mg/m³ RCR: 0.154
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.183
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Film formation - air drying (PROC 4)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Preparation of material for application. Mixing operations (open systems) (PROC 5)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.489
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Spraying (automatic/robotic) (PROC 7)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 0.429 mg/kg bw/day RCR: 0.036
Combined routes: RCR: 0.293
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Manual Spraying (PROC 7)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 2.143 mg/kg bw/day RCR: 0.182
Combined routes: RCR: 0.695
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Material transfers (PROC 8a)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.629
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Material transfers (PROC 8b)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Roller, spreader, flow application (PROC 10)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.629
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Dipping, immersion and pouring (PROC 13)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 0.137 mg/kg bw/day RCR: 0.012
Combined routes: RCR: 0.063
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Laboratory activities (PROC 15)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.286
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Material transfers. Drum/batch transfers. Transfer from/pouring from containers (PROC 9)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Production or preparation or articles by tabletting, compression, extrusion or pelletisation. (PROC 14)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 3.429 mg/kg bw/day RCR: 0.291
Combined routes: RCR: 0.547
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Acute systemic
A risk characterisation for short term duration (short term event, peak exposure) was not conducted as an Acute toxicity hazard leading to classification & labelling has not been identified.

Local effects via inhalation route
For the acute exposure, no RCR values have been calculated as the risks resulting from short-term exposure are covered by the long-term assessment

Contributing scenario: General exposures (closed systems) (PROC 1)
Long term: Exposure: 0.043 mg/m³ RCR: 5.181E-4
Exposure estimation Method: Extended TRA workers

Contributing scenario: General exposures (closed systems). with sample collection. Use in contained systems (PROC 2)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: Film formation - force drying (50 - 100°C). Stoving (>100°C). UV/EB radiation curing (PROC 2)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: Mixing operations (closed systems). General exposures (closed systems). (PROC 3)
Long term: Exposure: 12.77 mg/m³ RCR: 0.154
Exposure estimation Method: Extended TRA workers

Contributing scenario: Film formation - air drying (PROC 4)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Preparation of material for application. Mixing operations (open systems) (PROC 5)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Spraying (automatic/robotic) (PROC 7)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Manual Spraying (PROC 7)
Long term: Exposure: 42.57 mg/m³ RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Material transfers (PROC 8a)
Long term: Exposure: 42.57 mg/m³ RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Material transfers (PROC 8b)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Roller, spreader, flow application (PROC 10)
Long term: Exposure: 42.57 mg/m³ RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Dipping, immersion and pouring (PROC 13)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: Laboratory activities (PROC 15)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256

Exposure estimation Method: Extended TRA workers

Contributing scenario: Material transfers. Drum/batch transfers. Transfer from/pouring from containers (PROC 9)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Production or preparation or articles by tabletting, compression, extrusion or pelletisation. (PROC 14)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Local effects via dermal route
A DNEL for local effects of acute dermal exposure was not derived as an acute toxicity hazard has not been identified. For local effects of long-term dermal exposure, a DNEL was not derived as there is no information available about threshold effects and/or dose-response. Consequently, RCR values were not calculated for both exposure patterns.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
The Use Descriptors assigned based on the ECHA guidance on use descriptors R-12 represent the current understanding of the uses of our product

(http://echa.europa.eu/documents/10162/13632/information_requirements_r12_en.pdf).

Please carefully consider whether the listed Exposure Scenarios reflect your uses of Celanese's product. Different uses can be addressed in the same exposure scenario if the same operational conditions and risk management measures apply to all these uses. In addition, various types of activities can be expressed by one category for workers' exposure and one category for environmental exposure.
ECHA's "Guidance for Downstream Users" provides details how to decide whether or not your use is covered by the exposure scenarios and what to do if this is not the case

(http://echa.europa.eu/documents/10162/13634/du_en.pdf).

4. Industrial end-use (SU 3); Use in Oil field drilling and production operation; Oil field drilling; PC 17

Title of Exposure scenario Industrial end-use (SU 3); Use in Oil field drilling and production operation; Oil field drilling; PC 17

Environment: Use in Oil field drilling and production operation ERC 4

Worker

Bulk transfers from tote tanks and supply vessels PROC 8b
Charge from drums PROC 8b
Drilling mud (re-)formulation PROC 3
Drill floor operations PROC 4
Operations of solids filtering equipment - vapour and aerosol exposures PROC 4
Cleaning of solids equipment PROC 8a
Treatment and disposal of filtering solids PROC 3
Sample collection PROC 3
In-line injection (of process chemicals) by fixed dosing pumps PROC 1
Application (of process chemicals) by pouring from jug into systems PROC 8a
Scale squeeze operations PROC 4
Clean down and maintenance PROC 8a
General process exposure from enclosed processes PROC 2

2. Conditions of use affecting exposure

2.1 Control of environmental exposure: Use in Oil field drilling and production operation (ERC 4)

Amounts used
Daily amount per site <= 1.37 tonnes/day
Annual amount per site <= 41 tonnes/year

Other given operational conditions affecting environmental exposure
Receiving river flow rate >= 1.8E4 m3/d

Conditions and measures related to municipal sewage treatment plant
Wastewater is to be treated by a municipal STP.
Municipal STP discharge rate < 2E3 m3/d

2.2 Control of workers exposure for Bulk transfers from tote tanks and supply vessels (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.

2.3 Control of workers exposure for Charge from drums (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.

2.4 Control of workers exposure for Drilling mud (re-)formulation (PROC 3)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed batch process. All substance transfers closed. No regular manual interventions.

2.5 Control of workers exposure for Drill floor operations (PROC 4)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Use outdoors
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed batch manufacturing process. No open substance transfers.

2.6 Control of workers exposure for Operations of solids filtering equipment - vapour and aerosol exposures (PROC 4)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature

Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed batch manufacturing process. No open substance_transfers.

2.7 Control of workers exposure for Cleaning of solids equipment (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

Technical and organisational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 99%]

2.8 Control of workers exposure for Treatment and disposal of filtering solids (PROC 3)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed batch process. All substance transfers closed. No regular manual interventions.

2.9 Control of workers exposure for Sample collection (PROC 3)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed batch process. All substance transfers closed. No regular manual int_rventions.

2.10 Control of workers exposure for In-line injection (of process chemicals) by fixed dosing pumps (PROC 1)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed system. No contact to substance.

2.11 Control of workers exposure for Application (of process chemicals) by pouring from jug into systems (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

Technical and organisational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 99%]

2.12 Control of workers exposure for Scale squeeze operations (PROC 4)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed batch manuf_cturing process. No open substance transfers.
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 90%]

2.13 Control of workers exposure for Clean down and maintenance (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature

Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.14 Control of workers exposure for General process exposure from enclosed processes (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

3. Exposure estimation and reference to its source

Environment

Release route	**Release rate (kg/day)**	**Release estimation method**
Water	95.9	Other method - SPERC - ESVOC 11
Air	13.7	Other method - SPERC - ESVOC 11
Soil	0	Other method - SPERC - ESVOC 11

Protection target	**Exposure estimate** (based on: EUSES 2.0)	**RCR**
Freshwater (pelagic)	0.599 mg/L	0.998
Freshwater (sediment)	2.93 mg/kg dw	0.997
Marine water (pelagic)	0.06 mg/L	0.998
Marine water (sediment)	0.293 mg/kg dw	0.977
Freshwater food chain (predators)	#	#
Marine water food chain (predators)	#	#
Marine water food chain (top predators)	#	#
Effluent	5.99 mg/L	0.06
Agricultural soil	0.151 mg/kg dw	0.629
Terrestrial food chain (predator)	#	#

Not required as an accumulation via the food chain is not expected

Risk characterisation for man via the environment
Not required as an accumulation via the food chain is not expected

Worker exposure

Long-term, systemic

Contributing scenario: Bulk transfers from tote tanks and supply vessels (PROC 8b)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.373
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Charge from drums (PROC 8b)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.373
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Drilling mud (re-)formulation (PROC 3)
Inhalation: Exposure: 12.77 mg/m³ RCR: 0.154
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.183
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Drill floor operations (PROC 4)
Inhalation: Exposure: 14.9 mg/m³ RCR: 0.18
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.761
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Operations of solids filtering equipment - vapour and aerosol exposures (PROC 4)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.373
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Cleaning of solids equipment (PROC 8a)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 0.027 mg/kg bw/day RCR: 0.002
Combined routes: RCR: 0.054
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Treatment and disposal of filtering solids (PROC 3)
Inhalation: Exposure: 12.77 mg/m³ RCR: 0.154
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.183
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Sample collection (PROC 3)
Inhalation: Exposure: 12.77 mg/m³ RCR: 0.154
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.183
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: In-line injection (of process chemicals) by fixed dosing pumps (PROC 1)
Inhalation: Exposure: 0.043 mg/m³ RCR: 5.181E-4
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.03
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Application (of process chemicals) by pouring from jug into systems (PROC 8a)

Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 0.027 mg/kg bw/day RCR: 0.002
Combined routes: RCR: 0.054
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Scale squeeze operations (PROC 4)
Inhalation: Exposure: 2.129 mg/m³ RCR: 0.026
Dermal: Exposure: 0.686 mg/kg bw/day RCR: 0.058
Combined routes: RCR: 0.084
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Clean down and maintenance (PROC 8a)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.745
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: General process exposure from enclosed processes (PROC 2)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.168
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Acute systemic
A risk characterisation for short term duration (short term event, peak exposure) was not conducted as an Acute toxicity hazard leading to classification & labelling has not been identified.

Local effects via inhalation route
For the acute exposure, no RCR values have been calculated as the risks resulting from short-term exposure are covered by the long-term assessment

Contributing scenario: Bulk transfers from tote tanks and supply vessels (PROC 8b)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Charge from drums (PROC 8b)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Drilling mud (re-)formulation (PROC 3)
Long term: Exposure: 12.77 mg/m³ RCR: 0.154
Exposure estimation Method: Extended TRA workers

Contributing scenario: Drill floor operations (PROC 4)
Long term: Exposure: 14.9 mg/m³ RCR: 0.18
Exposure estimation Method: Extended TRA workers

Contributing scenario: Operations of solids filtering equipment - vapour and aerosol exposures (PROC 4)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Cleaning of solids equipment (PROC 8a)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: Treatment and disposal of filtering solids (PROC 3)
Long term: Exposure: 12.77 mg/m³ RCR: 0.154
Exposure estimation Method: Extended TRA workers

Contributing scenario: Bulk transfers from tote tanks and supply vessels (PROC 8b)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Charge from drums (PROC 8b)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Drilling mud (re-)formulation (PROC 3)
Long term: Exposure: 12.77 mg/m³ RCR: 0.154
Exposure estimation Method: Extended TRA workers

Contributing scenario: Drill floor operations (PROC 4)
Long term: Exposure: 14.9 mg/m³ RCR: 0.18
Exposure estimation Method: Extended TRA workers

Contributing scenario: Operations of solids filtering equipment - vapour and aerosol exposures (PROC 4)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Cleaning of solids equipment (PROC 8a)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: Treatment and disposal of filtering solids (PROC 3)
Long term: Exposure: 12.77 mg/m³ RCR: 0.154
Exposure estimation Method: Extended TRA workers

Local effects via dermal route
A DNEL for local effects of Acute Dermal: exposure was not derived as an Acute toxicity hazard has not been identified. For local effects of long-term Dermal: exposure, a DNEL was not derived as there is no information available about threshold effects and/or dose-response. Consequently, RCR values were not calculated for both exposure patterns.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
The Use Descriptors assigned based on the ECHA guidance on use descriptors R-12 represent the current understanding of the uses of our product

(http://echa.europa.eu/documents/10162/13632/information_requirements_r12_en.pdf).

Please carefully consider whether the listed Exposure Scenarios reflect your uses of Celanese's product. Different uses can be addressed in the same exposure scenario if the same operational conditions and risk management measures apply to all these uses. In addition, various types of activities can be expressed by one category for workers' exposure and one category for environmental exposure.
ECHA's "Guidance for Downstream Users" provides details how to decide whether or not your use is covered by the exposure scenarios and what to do if this is not the case

(http://echa.europa.eu/documents/10162/13634/du_en.pdf).

5. Industrial end-use (SU 3); Use in lubricants; Lubricants; PC 24

Title of Exposure scenario Industrial end-use (SU 3); Use in lubricants; Lubricants; PC 24

Environment: Use in lubricants ERC 4

Worker

General exposures (closed systems) PROC 1
General exposures (closed systems) – with sampling PROC 3
General exposures (open systems) PROC 4
Bulk transfers PROC 8b
Filling / preparation of equipment from drums or containers PROC 8a
Filling / preparation of equipment from drums or containers PROC 8b
Initial Factory fill of equipment PROC 9
Operation and lubrication of high energy open equipment PROC 17
Operation and lubrication of high energy open equipment PROC 18
Manual roller application or brushing PROC 10
Treatment of articles by dipping and pouring PROC 13
Spraying PROC 7
Maintenance (of larger plant items) and machine set-up PROC 8b
Maintenance (of larger plant items) and machine set-up PROC 8b
Draining equipment (small items) PROC 8a
Remanufacture of reject articles PROC 9
Storage PROC 2

2. Conditions of use affecting exposure

2.1 Control of environmental exposure: Use in lubricants (ERC 4)

Amounts used
Daily amount per site <= 5 tonnes/day
Annual amount per site <= 100 tonnes/year

Other given operational conditions affecting environmental exposure
Receiving river flow rate >= 1.8E4 m3/d

Conditions and measures related to municipal sewage treatment plant
Wastewater is to be treated by a municipal STP.
Municipal STP discharge rate < 2E3 m3/d

2.2 Control of workers exposure for General exposures (closed systems) (PROC 1)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures

Closed system. No contact to substance.

2.3 Control of workers exposure for General exposures (closed systems) – with sampling (PROC 3)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed batch process. All substance transfers closed. No regular manual interventions.

2.4 Control of workers exposure for General exposures (open systems) (PROC 4)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed batch manufacturing process. No open substance transfers.

2.5 Control of workers exposure for Bulk transfers (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.

2.6 Control of workers exposure for Filling / preparation of equipment from drums or containers (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure

Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.7 Control of workers exposure for Filling / preparation of equipment from drums or containers (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.

2.8 Control of workers exposure for Initial Factory fill of equipment (PROC 9)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Enclosed substance transfer points.

2.9 Control of workers exposure for Operation and lubrication of high energy open equipment (PROC 17)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

Technical and organisational conditions and measures
Partially closed lubrication system. Aerosol releases controlled
Provi_e extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 95% ; Dermal: 95%]

2.10 Control of workers exposure for Operation and lubrication of high energy open equipment (PROC 18)
Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

Technical and organisational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 95% ; Dermal: 95%]

2.11 Control of workers exposure for Manual roller application or brushing (PROC 10)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.12 Control of workers exposure for Treatment of articles by dipping and pouring (PROC 13)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

2.13 Control of workers exposure for Spraying (PROC 7)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands and upper wrists (1500 cm2)

Technical and organisational conditions and measures
Spraying in confined area with mechanical barriers.
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 95% ; Dermal:

95%]

2.14 Control of workers exposure for Maintenance (of larger plant items) and machine set-up (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.

2.15 Control of workers exposure for Maintenance (of larger plant items) and machine set-up (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

T_chnical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 97% ; Dermal: 90%]

2.16 Control of workers exposure for Draining equipment (small items) (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.17 Control of workers exposure for Remanufacture of reject articles (PROC 9)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure

Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Enclosed substance transfer points.

2.18 Control of workers exposure for Storage (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Use outdoors
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

3. Exposure estimation and reference to its source

Environment

Release route	**Release rate (kg/day)**	**Release estimation method**
Water	5	Other method - SPERC - ESVOC 13
Air	15	Other method - SPERC - ESVOC 13
Soil	0	Other method - SPERC - ESVOC 13

Protection target	**Exposure estimate** (based on: EUSES 2.0)	**RCR**
Freshwater (pelagic)	0.032 mg/L	0.053
Freshwater (sediment)	0.155 mg/kg dw	0.053
Marine water (pelagic)	0.003 mg/L	0.053
Marine water (sediment)	0.015 mg/kg dw	0.052
Freshwater food chain (predators)	#	#
Marine water food chain (predators)	#	#
Marine water food chain (top predators)	#	#
Effluent	0.312 mg/L	0.003
Agricultural soil	0.008 mg/kg dw	0.033
Terrestrial food chain (predator)	#	#

Not required as an accumulation via the food chain is not expected

Risk characterisation for man via the environment
Not required as an accumulation via the food chain is not expected

Worker exposure

Long-term, systemic

Contributing scenario: General exposures (closed systems) (PROC 1)
Inhalation: Exposure: 0.043 mg/m³ RCR: 5.181E-4
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.03
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: General exposures (closed systems) – with sampling (PROC 3)
Inhalation: Exposure: 12.77 mg/m³ RCR: 0.154
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.183
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: General exposures (open systems) (PROC 4)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Bulk transfers (PROC 8b)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Filling / preparation of equipment from drums or containers (PROC 8a)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.745
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Filling / preparation of equipment from drums or containers (PROC 8b)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Initial Factory fill of equipment (PROC 9)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Operation and lubrication of high energy open equipment (PROC 17)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.168
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Operation and lubrication of high energy open equipment (PROC 18)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 0.686 mg/kg bw/day RCR: 0.058
Combined routes: RCR: 0.109
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Manual roller application or brushing (PROC 10)

Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.745
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Treatment of articles by dipping and pouring (PROC 13)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.745
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Spraying (PROC 7)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 0.214 mg/kg bw/day RCR: 0.018
Combined routes: RCR: 0.275
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Maintenance (of larger plant items) and machine set-up (PROC 8b)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Maintenance (of larger plant items) and machine set-up (PROC 8b)
Inhalation: Exposure: 0.639 mg/m³ RCR: 0.008
Dermal: Exposure: 0.686 mg/kg bw/day RCR: 0.058
Combined routes: RCR: 0.066
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Draining equipment (small items) (PROC 8a)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.629
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Remanufacture of reject articles (PROC 9)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Inhalation: Exposure: 2.98 mg/m³ RCR: 0.036
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.152
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Acute systemic
A DNEL for acute dermal exposure (short term event, peak exposure) was not derived as an acute toxicity hazard (leading to C&L) has not been identified.

Local effects via inhalation route
For the acute exposure, no RCR values have been calculated as the risks resulting from short-term exposure are covered by the long-term assessment

Contributing scenario: General exposures (closed systems) (PROC 1)
Long term: Exposure: 0.043 mg/m³ RCR: 5.181E-4
Exposure estimation Method: Extended TRA workers

Contributing scenario: General exposures (closed systems) – with sampling (PROC 3)
Long term: Exposure: 12.77 mg/m³ RCR: 0.154
Exposure estimation Method: Extended TRA workers

Contributing scenario: General exposures (open systems) (PROC 4)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Bulk transfers (PROC 8b)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Filling / preparation of equipment from drums or containers (PROC 8a)
Long term: Exposure: 42.57 mg/m³ RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Filling / preparation of equipment from drums or containers (PROC 8b)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Initial Factory fill of equipment (PROC 9)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Operation and lubrication of high energy open equipment (PROC 17)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: Operation and lubrication of high energy open equipment (PROC 18)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: Manual roller application or brushing (PROC 10)
Long term: Exposure: 42.57 mg/m³ _B RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Treatment of articles by dipping and pouring (PROC 13)
Long term: Exposure: 42.57 mg/m³ RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Spraying (PROC 7)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Maintenance (of larger plant items) and machine set-up (PROC 8b)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Maintenance (of larger plant items) and machine set-up (PROC 8b)
Long term: Exposure: 0.639 mg/m³ RCR: 0.008
Exposure estimation Method: Extended TRA workers

Contributing scenario: Draining equipment (small items) (PROC 8a)
Long term: Exposure: 42.57 mg/m³ RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Remanufacture of reject articles (PROC 9)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Long term: Exposure: 2.98 mg/m³ RCR: 0.036
Exposure estimation Method: Extended TRA workers

Local effects via dermal route
A DNEL for local effects of Acute Dermal: exposure was not derived as an Acute toxicity hazard has not been identified. For local effects of long-term Dermal: exposure, a DNEL was not derived as there is no information available about threshold effects and/or dose-response. Consequently, RCR values were not calculated for both exposure patterns.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
The Use Descriptors assigned based on the ECHA guidance on use descriptors R-12 represent the current understanding of the uses of our product

(http://echa.europa.eu/documents/10162/13632/information_requirements_r12_en.pdf).

Please carefully consider whether the listed Exposure Scenarios reflect your uses of Celanese's product. Different uses can be addressed in the same exposure scenario if the same operational conditions and risk management measures apply to all these uses. In addition, various types of activities can be expressed by one category for workers' exposure and one category for environmental exposure.
ECHA's "Guidance for Downstream Users" provides details how to decide whether or not your use is covered by the exposure scenarios and what to do if this is not the case

(http://echa.europa.eu/documents/10162/13634/du_en.pdf).

6. Professional end-use (SU 22); Use in lubricants; Lubricants; PC 24

Title of Exposure scenario Professional end-use (SU 22); Use in lubricants; Lubricants; PC 24

Environment: Use in lubricants ERC 8a

Worker

General exposures from enclosed processes PROC 2
General exposures from closed processes PROC 3
Operation of equipment containing engine oils and similar PROC 20
General exposures from open processes PROC 4
Bulk transfers (e.g. deliveries to dealerships) PROC 8b
Filling preparation of equipment from drums or containers - dedicated facility PROC 8b
Filling preparation of equipment from drums or containers - non dedicated facility PROC 8a
Operation and lubrication of high energy open equipment PROC 17
Operation and lubrication of high energy open equipment PROC 18
Operation and lubrication of high energy open equipment, e.g. chain saw PROC 17
Maintenance and machine set-up PROC 8b
Maintenance and machine set-up PROC 8b
Draining equipment (small items) e.g. engine drains PROC 8a
Engine lubricant service - to cover small additions of oil to engines PROC 9
Manual roller application or brushing of coatings PROC 10
Manual roller application or brushing of coatings PROC 10
Manual roller application or brushing of coatings PROC 10
Spraying PROC 11
Spraying PROC 11
Treatment of articles by dipping and pouring with local exhaust ventilation PROC 13
Treatment of articles by dipping and pouring without local exhaust ventilation PROC 13
Storage PROC 2

2. Conditions of use affecting exposure

2.1 Control of environmental exposure: Use in lubricants (ERC 8a)

Other given operational conditions affecting environmental exposure
Receiving river flow rate >= 1.8E4 m3/d

Conditions and measures related to municipal sewage treatment plant
Wastewater is to be treated by a municipal STP.
Municipal STP discharge rate < 2E3 m3/d

2.2 Control of workers exposure for General exposures from enclosed processes (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

2.3 Control of workers exposure for General exposures from closed processes (PROC 3)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed batch process. All substance transfers closed. No regular manual interventions.

2.4 Control of workers exposure for Operation of equipment containing engine oils and similar (PROC 20)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Functional fluid in contained/dedicated equipment. No substance transfers

2.5 Control of workers exposure for General exposures from open processes (PROC 4)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed batch manufacturing process. No open substance transfers.
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 80% ; Dermal: 90%]

2.6 Control of workers exposure for Bulk transfers (e.g. deliveries to dealerships) (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)_
Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.

2.7 Control of workers exposure for Filling preparation of equipment from drums or containers - dedicated facility (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 90%]

2.8 Control of workers exposure for Filling preparation of equipment from drums or containers - non dedicated facility (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 4 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.9 Control of workers exposure for Operation and lubrication of high energy open equipment (PROC 17)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

Technical and organisational conditions and me_sures
Partially closed lubrication system. Aerosol releases controlled

Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 95%]

2.10 Control of workers exposure for Operation and lubrication of high energy open equipment (PROC 18)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

Technical and organisational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 95%]

2.11 Control of workers exposure for Operation and lubrication of high energy open equipment, e.g. chain saw (PROC 17)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 1 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Use outdoors
Exposed skin surface assumed: Two hands (960 cm2)

Technical and organisational conditions and measures
Partially closed lubrication system. Aerosol releases controlled

2.12 Control of workers exposure for Maintenance and machine set-up (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions an_ measures
Partially closed substance transfers and control of exhaust air.

2.13 Control of workers exposure for Maintenance and machine set-up (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 90%]

2.14 Control of workers exposure for Draining equipment (small items) e.g. engine drains (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better. Effectiveness >= 90%

2.15 Control of workers exposure for Engine lubricant service - to cover small additions of oil to engines (PROC 9)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 4 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor u_e assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Enclosed substance transfer points.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better. Effectiveness >= 90%

2.16 Control of workers exposure for Manual roller application or brushing of coatings (PROC 10)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.

Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

Technical and organisational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 80% ; Dermal: 95%]

2.17 Control of workers exposure for Manual roller application or brushing of coatings (PROC 10)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 4 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better. Effectiveness >= 90%

2.18 Control of workers exposure for Manual roller application or brushing of coatings (PROC 10)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)
Conditions_and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better. Effectiveness >= 90%

2.19 Control of workers exposure for Spraying (PROC 11)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands and upper wrists (1500 cm2)

Technical and organisational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 80% ; Dermal: 98%]
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better. Effectiveness >= 90%

2.20 Control of workers exposure for Spraying (PROC 11)

Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 1 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands and upper wrists (1500 cm2)
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better. Effectiveness >= 90%

2.21 Control of workers exposure for Treatment of articles by dipping and pouring with local exhaust ventilation (PROC 13)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure _Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 80% ; Dermal: 95%]

2.22 Control of workers exposure for Treatment of articles by dipping and pouring without local exhaust ventilation (PROC 13)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)
Conditions and measures related to personal protection, hygiene and health evaluation
Wear a respirator conforming to EN140 with Type A/P2 filter or better. Effectiveness >= 90%

2.23 Control of workers exposure for Storage (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Use outdoors

Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

3. Exposure estimation and reference to its source

Environment

Release route	**Release rate (kg/day)**	**Release estimation method**
Water	0.066	Other method - SPERC - ESVOC 15
Air	0	Other method - SPERC - ESVOC 15
Soil	---	Other method - SPERC - ESVOC 15

Protection target	**Exposure estimate** (based on: EUSES 2.0)	**RCR**
Freshwater (pelagic)	8.87E-4 mg/L	0.001
Freshwater (sediment)	0.004 mg/kg dw	0.001
Marine water (pelagic)	8.49E-5 mg/L	0.001
Marine water (sediment)	4.16E-4 mg/kg dw	0.001
Freshwater food chain (predators)	#	#
Marine water food chain (predators)	#	#
Marine water food chain (top predators)	#	#
Effluent	0.004 mg/L	0
Agricultural soil	1.17E-4 mg/kg dw	0
Terrestrial food chain (predator)	#	#

Not required as an accumulation via the food chain is not expected

Risk characterisation for man via the environment
Not required as an accumulation via the food chain is not expected

Worker exposure

Long-term, systemic

Contributing scenario: General exposures from enclosed processes (PROC 2)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.373
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: General exposures from closed processes (PROC 3)
Inhalation: Exposure: 12.77 mg/m³ RCR: 0.154
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.183
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Operation of equipment containing engine oils and similar (PROC 20)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 1.714 mg/kg bw/day RCR: 0.145
Combined routes: RCR: 0.402
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: General exposures from open processes (PROC 4)
Inhalation: Exposure: 8.515 mg/m³ RCR: 0.103
Dermal: Exposure: 0.686 mg/kg bw/day RCR: 0.058
Combined routes: RCR: 0.161
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Bulk transfers (e.g. deliveries to dealerships) (PROC 8b)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.629
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Filling preparation of equipment from drums or containers - dedicated facility (PROC 8b)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 0.686 mg/kg bw/day RCR: 0.058
Combined routes: RCR: 0.109
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Filling preparation of equipment from drums or containers - non dedicated facility (PROC 8a)
Inhalation: Exposure: 63.86 mg/m³ RCR: 0.769
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.886
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Operation and lubrication of high energy open equipment (PROC 17)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.373
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Operation and lubrication of high energy open equipment (PROC 18)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 0.137 mg/kg bw/day RCR: 0.012
Combined routes: RCR: 0.268
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Operation and lubrication of high _nergy open equipment, e.g. chain saw (PROC 17)
Inhalation: Exposure: 29.8 mg/m³ RCR: 0.359
Dermal: Exposure: 5.486 mg/kg bw/day RCR: 0.465
Combined routes: RCR: 0.824
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Maintenance and machine set-up (PROC 8b)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.629
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Maintenance and machine set-up (PROC 8b)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 0.137 mg/kg bw/day RCR: 0.012
Combined routes: RCR: 0.063
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Draining equipment (small items) e.g. engine drains (PROC 8a)
Inhalation: Exposure: 10.64 mg/m³ RCR: 0.128
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.361
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Engine lubricant service - to cover small additions of oil to engines (PROC 9)
Inhalation: Exposure: 2.554 mg/m³ RCR: 0.031
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.612
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Manual roller application or brushing of coatings (PROC 10)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.373
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Manual roller application or brushing of coatings (PROC 10)
Inhalation: Exposure: 6.386 mg/m³ RCR: 0.077_**Dermal:** Exposure: 5.486 mg/kg bw/day RCR: 0.465
Combined routes: RCR: 0.542
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Manual roller application or brushing of coatings (PROC 10)
Inhalation: Exposure: 10.64 mg/m³ RCR: 0.128
Dermal: Exposure: 5.486 mg/kg bw/day RCR: 0.465
Combined routes: RCR: 0.593
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Spraying (PROC 11)
Inhalation: Exposure: 8.515 mg/m³ RCR: 0.103
Dermal: Exposure: 2.143 mg/kg bw/day RCR: 0.182
Combined routes: RCR: 0.284
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Spraying (PROC 11)
Inhalation: Exposure: 8.515 mg/m³ RCR: 0.103
Dermal: Exposure: 5.357 mg/kg bw/day RCR: 0.454

Combined routes: RCR: 0.557
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Treatment of articles by dipping and pouring with local exhaust ventilation (PROC 13)
Inhalation: Exposure: 8.515 mg/m³ RCR: 0.103
Dermal: Exposure: 0.137 mg/kg bw/day RCR: 0.012
Combined routes: RCR: 0.114
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Treatment of articles by dipping and pouring without local exhaust ventilation (PROC 13)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.284
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Inhalation: Exposure: 14.9 mg/m³ RCR: 0.18
Dermal: Exposure: 1.371 mg/kg bw/day

Acute systemic
A risk characterisation for short term duration (short term event, peak exposure) was not conducted as an Acute toxicity hazard leading to classification & labelling has not been identified.

Local effects via inhalation route
For the acute exposure, no RCR values have been calculated as the risks resulting from short-term exposure are covered by the long-term assessment

Contributing scenario: General exposures from enclosed processes (PROC 2)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: General exposures from closed processes (PROC 3)
Long term: Exposure: 12.77 mg/m³ RCR: 0.154
Exposure estimation Method: Extended TRA workers

Contributing scenario: Operation of equipment containing engine oils and similar (PROC 20)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: General exposures from open processes (PROC 4)
Long term: Exposure: 8.515 mg/m³ RCR: 0.103
Exposure estimation Method: Extended TRA workers

Contributing scenario: Bulk transfers (e.g. deliveries to dealerships) (PROC 8b)
Long term: Exposure: 42.57 mg/m³ RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Filling preparation of equipment from drums or containers - dedicated facility (PROC 8b)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: Filling preparation of equipment from drums or containers - non dedicated facility (PROC 8a)
Long term: Exposure: 63.86 mg/m³ RCR: 0.769
Exposure estimation Method: Extended TRA workers

Contributing scenario: Operation and lubrication of high energy open equipment (PROC 17)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Operation and lubrication of high energy open equipment (PROC 18)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Operation and lubrication of high energy open equipment, e.g. chain saw (PROC 17)
Long term: Exposure: 29.8 mg/m³ RCR: 0.359
Exposure estimation Method: Extended TRA workers

Contributing scenario: Maintenance and machine set-up (PROC 8b)
Long term: Exposure: 42.57 mg/m³ RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Maintenance and machine set-up (PROC 8b)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: Draining equipment (small items) e.g. engine drains (PROC 8a)
Long term: Exposure: 10.64 mg/m³ RCR: 0.128
Exposure estimation Method: Extended TRA workers

Contributing scenario: Engine lubricant service - to cover small additions of oil to engines (PROC 9)
Long term: Exposure: 2.554 mg/m³ RCR: 0.031
Exposure estimation Method: Extended TRA workers

Contributing scenario: Manual roller application or brushing of coatings (PROC 10)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scen_rio: Manual roller application or brushing of coatings (PROC 10)
Long term: Exposure: 6.386 mg/m³ RCR: 0.077
Exposure estimation Method: Extended TRA workers

Contributing scenario: Manual roller application or brushing of coatings (PROC 10)
Long term: Exposure: 10.64 mg/m³ RCR: 0.128
Exposure estimation Method: Extended TRA workers

Contributing scenario: Spraying (PROC 11)
Long term: Exposure: 8.515 mg/m³ RCR: 0.103
Exposure estimation Method: Extended TRA workers

Contributing scenario: Spraying (PROC 11)
Long term: Exposure: 8.515 mg/m³ RCR: 0.103
Exposure estimation Method: Extended TRA workers

Contributing scenario: Treatment of articles by dipping and pouring with local exhaust ventilation (PROC 13)
Long term: Exposure: 8.515 mg/m³ RCR: 0.103
Exposure estimation Method: Extended TRA workers

Contributing scenario: Treatment of articles by dipping and pouring without local exhaust ventilation (PROC 13)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Long term: Exposure: 14.9 mg/m³ RCR: 0.18
Exposure estimation Method: Extended TRA workers

Local effects via dermal route
A DNEL for local effects of Acute Dermal: exposure was not derived as an Acute toxicity hazard has not been identified. For local effects of long-term Dermal: exposure, a DNEL was not derived as there is no information available about threshold effects and/or dose-response. Consequently, RCR values were not calculated for both exposure patterns.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
The Use Descriptors assigned based on the ECHA guidance on use descriptors R-12 represent the current understanding of the uses of our product

(http://echa.europa.eu/documents/10162/13632/information_requirements_r12_en.pdf).

Please carefully consider whether the listed Exposure Scenarios reflect your uses of Celanese's product. Different uses can be addressed in the same exposure scenario if the same operational conditions and risk management measures apply to all these uses. In addition, various types of activities can be expressed by one category for workers' exposure and one category for environmental exposure.
ECHA's "Guidance for Downstream Users" provides details how to decide whether or not your use is covered by the exposure scenarios and what to do if this is not the case

(http://echa.europa.eu/documents/10162/13634/du_en.pdf).

7. Industrial end-use (SU 3); Use in functional fluids; Functional fluids; PC 17

Title of Exposure scenario Industrial end-use (SU 3); Use in functional fluids; Functional fluids; PC 17

Environment: Use in functional fluids ERC 7

Worker

Bulk transfers to/from storage PROC 2
Transfers from drums to filling machinery PROC 8b
Filling articles from predominantly enclosed machines PROC 9
Manual filling of machines PROC 8a
Operation of closed equipment containing functional fluids PROC 2
Operation of open equipment containing functional fluids PROC 4
Re-work on off specification articles PROC 9
Maintenance of equipment PROC 8a
Storage PROC 2

2. Conditions of use affecting exposure

2.1 Control of environmental exposure: Use in functional fluids (ERC 7)

Amounts used
Daily amount per site <= 0.2 tonnes/day
Annual amount per site <= 4 tonnes/year

Other given operational conditions affecting environmental exposure
Receiving river flow rate >= 1.8E4 m3/d

Conditions and measures related to municipal sewage treatment plant
Wastewater is to be treated by a municipal STP.
Municipal STP discharge rate < 2E3 m3/d

2.2 Control of workers exposure for Bulk transfers to/from storage (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

2.3 Control of workers exposure for Transfers from drums to filling machinery (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.

2.4 Control of workers exposure for Filling articles from predominantly enclosed machines (PROC 9)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Enclosed substance transfer points.

2.5 Control of workers exposure for Manual filling of machines (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.6 Control of workers exposure for Operation of closed equipment containing functional fluids (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

2.7 Control of workers exposure for Operation of open equipment containing functional fluids (PROC 4)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed batch manufacturing process. No open substance transfers.

2.8 Control of workers exposure for Re-work on off specification articles (PROC 9)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Enclosed substance transfer points.

2.9 Control of workers exposure for Maintenance of equipment (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.10 Control of workers exposure for Storage (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Use outdoors
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

3. Exposure estimation and reference to its source

Environment

Release route	**Release rate (kg/day)**	**Release estimation method**
Water	0.2	Other method - SPERC ESVOC 31
Air	2	Other method - SPERC ESVOC 31
Soil	0	Other method - SPERC ESVOC 31

Protection target	**Exposure estimate** (based on: EUSES 2.0)	**RCR**
Freshwater (pelagic)	0.002 mg/L	0.003
Freshwater (sediment)	0.008 mg/kg dw	0.003
Marine water (pelagic)	1.69E-4 mg/L	0.003
Marine water (sediment)	8.25E-4 mg/kg dw	0.003
Freshwater food chain (predators)	#	#
Marine water food chain (predators)	#	#
Marine water food chain (top predators)	#	#
Effluent	0.012 mg/L	0
Agricultural soil	3.32E-4 mg/kg dw	0.001
Terrestrial food chain (predator)	#	#

Not required as an accumulation via the food chain is not expected

Risk characterisation for man via the environment
Not required as an accumulation via the food chain is not expected

Worker exposure

Long-term, systemic

Contributing scenario: Bulk transfers to/from storage (PROC 2)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.168
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Transfers from drums to filling machinery (PROC 8b)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Filling articles from predominantly enclosed machines (PROC 9)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Manual filling of machines (PROC 8a)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.745
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Operation of closed equipment containing functional fluids (PROC 2)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.168
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Operation of open equipment containing functional fluids (PROC 4)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: E_posure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Re-work on off specification articles (PROC 9)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Maintenance of equipment (PROC 8a)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.745
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Inhalation: Exposure: 2.98 mg/m³ RCR: 0.036
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.152
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Acute systemic
A risk characterisation for short term duration (short term event, peak exposure) was not conducted as an Acute toxicity hazard leading to classification & labelling has not been identified.

Local effects via inhalation route
For the acute exposure, no RCR values have been calculated as the risks resulting from short-term exposure are covered by the long-term assessment

Contributing scenario: Bulk transfers to/from storage (PROC 2)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: Transfers from drums to filling machinery (PROC 8b)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Filling articles from predominantly enclosed machines (PROC 9)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Manual filling of machines (PROC 8a)
Long term: Exposure: 42.57 mg/m³ RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Operation of closed equipment containing functional fluids (PROC 2)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: Operation of open equipment containing functional fluids (PROC 4)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Re-work on off specification articles (PROC 9)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Maintenance of equipment (PROC 8a)
Long term: Exposure: 42.57 mg/m³ RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Long term: Exposure: 2.98 mg/m³ RCR: 0.036
Exposure estimation Method: Extended TRA workers

Local effects via dermal route
A DNEL for local effects of Acute Dermal exposure was not derived as an Acute toxicity hazard has not been identified. For local effects of long-term dermal exposure, a DNEL was not derived as there is no information available about threshold effects and/or dose-response. Consequently, RCR values were not calculated for both exposure patterns.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The Use Descriptors assigned based on the ECHA guidance on use descriptors R-12 represent the current understanding of the uses of our product

(http://echa.europa.eu/documents/10162/13632/information_requirements_r12_en.pdf).

Please carefully consider whether the listed Exposure Scenarios reflect your uses of Celanese's product. Different uses can be addressed in the same exposure scenario if the same operational conditions and risk management measures apply to all these uses. In addition, various types of activities can be expressed by one category for workers' exposure and one category for environmental exposure.
ECHA's "Guidance for Downstream Users" provides details how to decide whether or not your use is covered by the exposure scenarios and what to do if this is not the case

(http://echa.europa.eu/documents/10162/13634/du_en.pdf).

8. Professional end-use (SU 22); Use in functional fluids; Functional fluids; PC 17

Title of Exposure scenario Professional end-use (SU 22); Use in functional fluids; Functional fluids; PC 17

Environment: Use in functional fluids ERC 9a

Worker

Transfers from drums to filling machinery PROC 8a
Filling from small containers e.g. cans PROC 9
Manual filling from drums PROC 9
Operation of equipment containing functional fluids PROC 2
Operation of equipment containing functional fluids PROC 20
Re-work on off specification articles PROC 9
Maintenance of equipment PROC 8a
Storage PROC 2

2. Conditions of use affecting exposure

2.1 Control of environmental exposure: Use in functional fluids (ERC 9a)

Other given operational conditions affecting environmental exposure
Receiving river flow rate >= 1.8E4 m3/d

Conditions and measures related to municipal sewage treatment plant
Wastewater is to be treated by a municipal STP.
Municipal STP discharge rate < 2E3 m3/d

2.2 Control of workers exposure for Transfers from drums to filling machinery (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

Technical and organisational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 80% ; Dermal: 99%]

2.3 Control of workers exposure for Filling from small containers e.g. cans (PROC 9)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature

Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Enclosed substance transfer points.
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 80% ; Dermal: 90%]

2.4 Control of workers exposure for Manual filling from drums (PROC 9)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Enclosed substance transfer points.
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 80% ; Dermal: 90%]

2.5 Control of workers exposure for Operation of equipment containing functional fluids (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

2.6 Control of workers exposure for Operation of equipment containing functional fluids (PROC 20)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Functional fluid in contained/dedicated equipment. No substance transfers

2.7 Control of workers exposure for Re-work on off specification articles (PROC 9)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Enclosed substance transfer points.

2.8 Control of workers exposure for Maintenance of equipment (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

Technical and organisational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 80% ; Dermal: 99%]

2.9 Control of workers exposure for Storage (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Use outdoors
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

3. Exposure estimation and reference to its source

Environment

Release route	**Release rate (kg/day)**	**Release estimation method**
Water	0	Other method - SPERC ESVOC 32
Air	0	Other method - SPERC ESVOC 32
Soil	---	Other method - SPERC ESVOC 32

Protection target	**Exposure estimate** (based on: EUSES 2.0)	**RCR**
Freshwater (pelagic)	4.75E-4 mg/L	0.001
Freshwater (sediment)	0.002 mg/kg dw	0.001
Marine water (pelagic)	4.37E-5 mg/L	0.001
Marine water (sediment)	2.14E-4 mg/kg dw	0.001
Freshwater food chain (predators)	#	#
Marine water food chain (predators)	#	#
Marine water food chain (top predators)	#	#
Effluent	3.44E-6 mg/L	0
Agricultural soil	1.34E-5 mg/kg dw	0
Terrestrial food chain (predator)	#	#

Not required as an accumulation via the food chain is not expected

Risk characterisation for man via the environment
Not required as an accumulation via the food chain is not expected

Worker exposure

Long-term, systemic

Contributing scenario: Transfers from drums to filling machinery (PROC 8a)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 0.137 mg/kg bw/day RCR: 0.012
Combined routes: RCR: 0.268
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Filling from small containers e.g. cans (PROC 9)
Inhalation: Exposure: 8.515 mg/m³ RCR: 0.103
Dermal: Exposure: 0.686 mg/kg bw/day RCR: 0.058
Combined routes: RCR: 0.161
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Manual filling from drums (PROC 9)
Inhalation: Exposure: 8.515 mg/m³ RCR: 0.103
Dermal: Exposure: 0.686 mg/kg bw/day RCR: 0.058
Combined routes: RCR: 0.161
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Operation of equipment containing functional fluids (PROC 2)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.373
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Operation of equipment containing functional fluids (PROC 20)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 1.714 mg/kg bw/day RCR: 0.145
Combined routes: RCR: 0.402
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Re-work on off specification articles (PROC 9)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.629
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Maintenance of equipment (PROC 8a)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 0.027 mg/kg bw/day RCR: 0.002
Combined routes: RCR: 0.259
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Inhalation: Exposure: 14.9 mg/m³ RCR: 0.18
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.296
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Acute systemic
A risk characterisation for short term duration (short term event, peak exposure) was not conducted as an Acute toxicity hazard leading to classification & labelling has not been identified.

Local effects via inhalation route
For the acute exposure, no RCR values have been calculated as the risks resulting from short-term exposure are covered by the long-term assessment

Contributing scenario: Transfers from drums to filling machinery (PROC 8a)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Filling from small containers e.g. cans (PROC 9)
Long term: Exposure: 8.515 mg/m³ RCR: 0.103
Exposure estimation Method: Extended TRA workers

Contributing scenario: Manual filling from drums (PROC 9)
Long term: Exposure: 8.515 mg/m³ RCR: 0.103
Exposure estimation Method: Extended TRA workers

Contributing scenario: Operation of equipment containing functional fluids (PROC 2)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Operation of equipment containing functional fluids (PROC 20)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Re-work on off specification articles (PROC 9)
Long term: Exposure: 42.57 mg/m³ RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Maintenance of equipment (PROC 8a)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Long term: Exposure: 14.9 mg/m³ RCR: 0.18
Exposure estimation Method: Extended TRA workers

Local effects via dermal route
A DNEL for local effects of Acute Dermal exposure was not derived as an toxicity hazard has not been identified. For local effects of long-term Dermal exposure, a DNEL was not derived as there is no information available about threshold effects and/or dose-response. Consequently, RCR values were not calculated for both exposure patterns.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
The Use Descriptors assigned based on the ECHA guidance on use descriptors R-12 represent the current understanding of the uses of our product

(http://echa.europa.eu/documents/10162/13632/information_requirements_r12_en.pdf).

Please carefully consider whether the listed Exposure Scenarios reflect your uses of Celanese's product. Different uses can be addressed in the same exposure scenario if the same operational conditions and risk management measures apply to all these uses. In addition, various types of activities can be expressed by one category for workers' exposure and one category for environmental exposure.
ECHA's "Guidance for Downstream Users" provides details how to decide whether or not your use is covered by the exposure scenarios and what to do if this is not the case

(http://echa.europa.eu/documents/10162/13634/du_en.pdf).

9. Industrial end-use (SU 3); Use in laboratories; Laboratory chemicals; PC 21

Title of Exposure scenario Industrial end-use (SU 3); Use in laboratories; Laboratory chemicals; PC 21

Environment: Use in laboratories ERC 4

Worker

Cleaning of glassware etc PROC 10
Handling of small quantities PROC 15

2. Conditions of use affecting exposure

2.1 Control of environmental exposure: Use in laboratories (ERC 4)

Amounts used
Daily amount per site <= 0.1 tonnes/day
Annual amount per site <= 2 tonnes/year

Other given operational conditions affecting environmental exposure
Receiving river flow rate >= 1.8E4 m3/d

Conditions and measures related to municipal sewage treatment plant
Wastewater is to be treated by a municipal STP.
Municipal STP discharge rate < 2E3 m3/d

2.2 Control of workers exposure for Cleaning of glassware etc (PROC 10)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 4 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.3 Control of workers exposure for Handling of small quantities (PROC 15)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

3. Exposure estimation and reference to its source

Environment

Release route	**Release rate (kg/day)**	**Release estimation method**
Water	2	Other method - ESVOC 38
Air	2.5	Other method - ESVOC 38
Soil	0	Other method - ESVOC 38

Protection target	**Exposure estimate** (based on: EUSES 2.0)	**RCR**
Freshwater (pelagic)	0.013 mg/L	0.022
Freshwater (sediment)	0.064 mg/kg dw	0.022
Marine water (pelagic)	0.001 mg/L	0.022
Marine water (sediment)	0.006 mg/kg dw	0.021
Freshwater food chain (predators)	#	#
Marine water food chain (predators)	#	#
Marine water food chain (top predators)	#	#
Effluent	0.125 mg/L	0.001
Agricultural soil	0.003 mg/kg dw	0.013
Terrestrial food chain (predator)	#	#

Not required as an accumulation via the food chain is not expected

Risk characterisation for man via the environment
Not required as an accumulation via the food chain is not expected.

Worker exposure

Long-term, systemic

Contributing scenario: Cleaning of glassware etc (PROC 10)
Inhalation: Exposure: 25.54 mg/m³ RCR: 0.308
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.54
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Handling of small quantities (PROC 15)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.286
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Acute systemic
A risk characterisation for short term duration (short term event, peak exposure) was not conducted as an Acute toxicity hazard leading to classification & labelling has not been identified.

Local effects via inhalation route
For the acute exposure, no RCR values have been calculated as the risks resulting from short-term exposure are covered by the long-term assessment

Contributing scenario: Cleaning of glassware etc (PROC 10)
Long term: Exposure: 25.54 mg/m³ RCR: 0.308
Exposure estimation Method: Extended TRA workers

Contributing scenario: Handling of small quantities (PROC 15)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Local effects via dermal route
A DNEL for local effects of acute dermal exposure was not derived as an acute toxicity hazard has not been identified. For local effects of long-term dermal exposure, a DNEL was not derived as there is no information available about threshold effects and/or dose-response. Consequently, RCR values were not calculated for both exposure patterns.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
The Use Descriptors assigned based on the ECHA guidance on use descriptors R-12 represent the current understanding of the uses of our product

(http://echa.europa.eu/documents/10162/13632/information_requirements_r12_en.pdf).

Please carefully consider whether the listed Exposure Scenarios reflect your uses of Celanese's product. Different uses can be addressed in the same exposure scenario if the same operational conditions and risk management measures apply to all these uses. In addition, various types of activities can be expressed by one category for workers' exposure and one category for environmental exposure.
ECHA's "Guidance for Downstream Users" provides details how to decide whether or not your use is covered by the exposure scenarios and what to do if this is not the case

(http://echa.europa.eu/documents/10162/13634/du_en.pdf).

10. Professional end-use (SU 22); Use in laboratories; Laboratory chemicals; PC 21

Title of Exposure scenario Professional end-use (SU 22); Use in laboratories; Laboratory chemicals; PC 21

Environment: Use in laboratories ERC 8a

Worker

Cleaning of glassware etc PROC 10
Handling of small quantities PROC 15

2. Conditions of use affecting exposure

2.1 Control of environmental exposure: Use in laboratories (ERC 8a)

Other given operational conditions affecting environmental exposure
Receiving river flow rate >= 1.8E4 m3/d

Conditions and measures related to municipal sewage treatment plant
Wastewater is to be treated by a municipal STP.
Municipal STP discharge rate < 2E3 m3/d

2.2 Control of workers exposure for Cleaning of glassware etc (PROC 10)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 1 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.3 Control of workers exposure for Handling of small quantities (PROC 15)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

3. Exposure estimation and reference to its source

Environment

Release route	**Release rate (kg/day)**	**Release estimation method**
Water	0.004	Other method - ESVOC 39
Air	0	Other method - ESVOC 39
Soil	---	Other method - ESVOC 39

Protection target	**Exposure estimate** (based on: EUSES 2.0)	**RCR**
Freshwater (pelagic)	5E-4 mg/L	0.001
Freshwater (sediment)	0.002 mg/kg dw	0.001
Marine water (pelagic)	4.63E-5 mg/L	0.001
Marine water (sediment)	2.27E-4 mg/kg dw	0.001
Freshwater food chain (predators)	#	#
Marine water food chain (predators)	#	#
Marine water food chain (top predators)	#	#
Effluent	2.58E-4 mg/L	0
Agricultural soil	1.98E-5 mg/kg dw	0
Terrestrial food chain (predator)	#	#

Not required as an accumulation via the food chain is not expected

Risk characterisation for man via the environment
Not required as an accumulation via the food chain is not expected.

Worker exposure

Long-term, systemic

Contributing scenario: Cleaning of glassware etc (PROC 10)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.489
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Handling of small quantities (PROC 15)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.286
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Acute systemic
A risk characterisation for short term duration (short term event, peak exposure) was not conducted as an Acute toxicity hazard leading to classification & labelling has not been identified.

Local effects via inhalation route
For the acute exposure, no RCR values have been calculated as the risks resulting from short-term exposure are covered by the long-term assessment

Contributing scenario: Cleaning of glassware etc (PROC 10)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Handling of small quantities (PROC 15)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Local effects via dermal route

A DNEL for local effects of acute dermal exposure was not derived as an acute toxicity hazard has not been identified. For local effects of long-term dermal exposure, a DNEL was not derived as there is no information available about threshold effects and/or dose-response. Consequently, RCR values were not calculated for both exposure patterns.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The Use Descriptors assigned based on the ECHA guidance on use descriptors R-12 represent the current understanding of the uses of our product

(http://echa.europa.eu/documents/10162/13632/information_requirements_r12_en.pdf).

Please carefully consider whether the listed Exposure Scenarios reflect your uses of Celanese's product. Different uses can be addressed in the same exposure scenario if the same operational conditions and risk management measures apply to all these uses. In addition, various types of activities can be expressed by one category for workers' exposure and one category for environmental exposure.
ECHA's "Guidance for Downstream Users" provides details how to decide whether or not your use is covered by the exposure scenarios and what to do if this is not the case

(http://echa.europa.eu/documents/10162/13634/du_en.pdf).

11. Industrial end-use (SU 3); Polymer processing; Polymer processing; PC 32

Title of Exposure scenario Industrial end-use (SU 3); Polymer processing; Polymer processing; PC 32

Environment: Polymer processing ERC 4

Worker

Bulk transfers of polymer prill/pellet etc to/from storage PROC 2
Semi-bulk transfers to/from storage e.g. IBCs, big bags PROC 8b
In-line weighing of (bulk) polymer additives PROC 2
Small scale weighing of polymer additives PROC 9
Pre-mixing of polymer additives e.g. polyols PROC 4
Batch pre-mixing of additives PROC 5
Transfer of polymer additives to calendars PROC 9
Calendaring activities PROC 6
Formation of articles via polyol processes PROC 13
Extrusion and masterbatching of finished/ formulated polymer PROC 14
Article formation (injection moulding) PROC 14
Maintenance of equipment PROC 8a
Storage PROC 2

2. Conditions of use affecting exposure

2.1 Control of environmental exposure: Polymer processing (ERC 4)

Amounts used
Daily amount per site <= 5 tonnes/day
Annual amount per site <= 100 tonnes/year

Other given operational conditions affecting environmental exposure
Receiving river flow rate >= 1.8E4 m3/d

Conditions and measures related to municipal sewage treatment plant
Wastewater is to be treated by a municipal STP.
Municipal STP discharge rate < 2E3 m3/d

2.2 Control of workers exposure for Bulk transfers of polymer prill/pellet etc to/from storage (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

2.3 Control of workers exposure for Semi-bulk transfers to/from storage e.g. IBCs, big bags (PROC 8b)
Product characteristics

Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.

2.4 Control of workers exposure for In-line weighing of (bulk) polymer additives (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

2.5 Control of workers exposure for Small scale weighing of polymer additives (PROC 9)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Enclosed substance transfer points.

2.6 Control of workers exposure for Pre-mixing of polymer additives e.g. polyols (PROC 4)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed batch manufacturing process. No open substance transfers.

2.7 Control of workers exposure for Batch pre-mixing of additives (PROC 5)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed mixing and blending of chemicals. No open substance transfers.

2.8 Control of workers exposure for Transfer of polymer additives to calendars (PROC 9)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Enclosed substance transfer points.

2.9 Control of workers exposure for Calendaring activities (PROC 6)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.10 Control of workers exposure for Formation of articles via polyol processes (PROC 13)
Product characteristics
Concentration of substance in product 5 – 25%

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature

Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

2.11 Control of workers exposure for Extrusion and masterbatching of finished/ formulated polymer (PROC 14)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

2.12 Control of workers exposure for Article formation (injection moulding) (PROC 14)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

2.13 Control of workers exposure for Maintenance of equipment (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 1 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.14 Control of workers exposure for Storage (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Use outdoors
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

3. Exposure estimation and reference to its source

Environment

Release route	**Release rate (kg/day)**	**Release estimation method**
Water	0	Other method - SPERC ESVOC 44
Air	250	Other method - SPERC ESVOC 44
Soil	0	Other method - SPERC ESVOC 44

Protection target	**Exposure estimate** (based on: EUSES 2.0)	**RCR**
Freshwater (pelagic)	4.74E-4 mg/L	0.001
Freshwater (sediment)	0.002 mg/kg dw	0.001
Marine water (pelagic)	4.37E-5 mg/L	0.001
Marine water (sediment)	2.14E-4 mg/kg dw	0.001
Freshwater food chain (predators)	#	#
Marine water food chain (predators)	#	#
Marine water food chain (top predators)	#	#
Effluent	0 mg/L	0
Agricultural soil	5.19E-4 mg/kg dw	0.002
Terrestrial food chain (predator)	#	#

Not required as an accumulation via the food chain is not expected

Risk characterisation for man via the environment
Not required as an accumulation via the food chain is not expected.

Worker exposure

Long-term, systemic

Contributing scenario: Bulk transfers of polymer prill/pellet etc to/from storage (PROC 2)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.168
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Semi-bulk transfers to/from storage e.g. IBCs, big bags (PROC 8b)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: In-line weighing of (bulk) polymer additives (PROC 2)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.168
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Small scale weighing of polymer additives (PROC 9)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Pre-mixing of polymer additives e.g. polyols (PROC 4)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Batch pre-mixing of additives (PROC 5)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.489
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Transfer of polymer additives to calendars (PROC 9)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Calendaring activities (PROC 6)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 5.486 mg/kg bw/day RCR: 0.465
Combined routes: RCR: 0.721
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Formation of articles via polyol processes (PROC 13)
Inhalation: Exposure: 25.54 mg/m³ RCR: 0.308
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.54
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Extrusion and masterbatching of finished/ formulated polymer (PROC 14)

Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 3.429 mg/kg bw/day RCR: 0.291
Combined routes: RCR: 0.547
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Article formation (injection moulding) (PROC 14)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 3.429 mg/kg bw/day RCR: 0.291
Combined routes: RCR: 0.547
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Maintenance of equipment (PROC 8a)
Inhalation: Exposure: 8.515 mg/m³ RCR: 0.103
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.335
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Inhalation: Exposure: 2.98 mg/m³ RCR: 0.036
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.152
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Acute systemic
A risk characterisation for short term duration (short term event, peak exposure) was not conducted as an Acute toxicity hazard leading to classification & labelling has not been identified.

Local effects via inhalation route
For the acute exposure, no RCR values have been calculated as the risks resulting from short-term exposure are covered by the long-term assessment

Contributing scenario: Bulk transfers of polymer prill/pellet etc to/from storage (PROC 2)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: Semi-bulk transfers to/from storage e.g. IBCs, big bags (PROC 8b)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: In-line weighing of (bulk) polymer additives (PROC 2)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: Small scale weighing of polymer additives (PROC 9)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Pre-mixing of polymer additives e.g. polyols (PROC 4)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Batch pre-mixing of additives (PROC 5)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Transfer of polymer additives to calendars (PROC 9)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Calendaring activities (PROC 6)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Formation of articles via polyol processes (PROC 13)
Long term: Exposure: 25.54 mg/m³ RCR: 0.308
Exposure estimation Method: Extended TRA workers

Contributing scenario: Extrusion and masterbatching of finished/ formulated polymer (PROC 14)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Article formation (injection moulding) (PROC 14)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Maintenance of equipment (PROC 8a)
Long term: Exposure: 8.515 mg/m³ RCR: 0.103
Exposure estimation Method: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Long term: Exposure: 2.98 mg/m³ RCR: 0.036
Exposure estimation Method: Extended TRA workers

Local effects via dermal route

A DNEL for local effects of acute Dermalexposure was not derived as an acute toxicity hazard has not been identified. For local effects of long-term dermal exposure, a DNEL was not derived as there is no information available about threshold effects and/or dose-response. Consequently, RCR values were not calculated for both exposure patterns.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The Use Descriptors assigned based on the ECHA guidance on use descriptors R-12 represent the current understanding of the uses of our product

(http://echa.europa.eu/documents/10162/13632/information_requirements_r12_en.pdf).

Please carefully consider whether the listed Exposure Scenarios reflect your uses of Celanese's product. Different uses can be addressed in the same exposure scenario if the same operational conditions and risk management measures apply to all these uses. In addition, various types of activities can be expressed by one category for workers' exposure and one category for environmental exposure.
ECHA's "Guidance for Downstream Users" provides details how to decide whether or not your use is covered by the exposure scenarios and what to do if this is not the case

(http://echa.europa.eu/documents/10162/13634/du_en.pdf).

12. Professional end-use (SU 22); Polymer processing; Polymer processing; PC 32

Title of Exposure scenario Professional end-use (SU 22); Polymer processing; Polymer processing; PC 32

Environment: Polymer processing ERC 8a

Worker

Bulk transfers of polymer prill/pellet etc to/from storage PROC 2
Semi-bulk transfers to/from storage e.g. IBCs, big bags PROC 8b
Article formation (injection moulding) PROC 6
Article formation (injection moulding) PROC 14
Maintenance of equipment PROC 8a
Storage PROC 2

2. Conditions of use affecting exposure

2.1 Control of environmental exposure: Polymer processing (ERC 8a)

Other given operational conditions affecting environmental exposure
Receiving river flow rate >= 1.8E4 m3/d

Conditions and measures related to municipal sewage treatment plant
Wastewater is to be treated by a municipal STP.
Municipal STP discharge rate < 2E3 m3/d

2.2 Control of workers exposure for Bulk transfers of polymer prill/pellet etc to/from storage (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

2.3 Control of workers exposure for Semi-bulk transfers to/from storage e.g. IBCs, big bags (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures

Partially closed substance transfers and control of exhaust air.
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 90% ; Dermal: 90%]

2.4 Control of workers exposure for Article formation (injection moulding) (PROC 6)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

Technical and organisational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 80% ; Dermal: 95%]

2.5 Control of workers exposure for Article formation (injection moulding) (PROC 14)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

2.6 Control of workers exposure for Maintenance of equipment (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

Technical and organisational conditions and measures
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 80% ; Dermal: 99%]

2.7 Control of workers exposure for Storage (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Use outdoors
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

3. Exposure estimation and reference to its source

Environment

Release route	**Release rate (kg/day)**	**Release estimation method**
Water	0.001	Other method - SPERC ESVOC 45
Air	0	Other method - SPERC ESVOC 45
Soil	---	Other method - SPERC ESVOC 45

Protection target	**Exposure estimate** (based on: EUSES 2.0)	**RCR**
Freshwater (pelagic)	4.78E-4 mg/L	0.001
Freshwater (sediment)	0.002 mg/kg dw	0.001
Marine water (pelagic)	4.4E-5 mg/L	0.001
Marine water (sediment)	2.16E-4 mg/kg dw	0.001
Freshwater food chain (predators)	#	#
Marine water food chain (predators)	#	#
Marine water food chain (top predators)	#	#
Effluent	3.44E-5 mg/L	0
Agricultural soil	1.41E-5 mg/kg dw	0
Terrestrial food chain (predator)	#	#

Not required as an accumulation via the food chain is not expected

Risk characterisation for man via the environment
Not required as an accumulation via the food chain is not expected.

Worker exposure

Long-term, systemic

Contributing scenario: Bulk transfers of polymer prill/pellet etc to/from storage (PROC 2)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.373
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Semi-bulk transfers to/from storage e.g. IBCs, big bags (PROC 8b)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 0.686 mg/kg bw/day RCR: 0.058
Combined routes: RCR: 0.109
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Article formation (injection moulding) (PROC 6)
Inhalation: Exposure: 8.515 mg/m³ RCR: 0.103
Dermal: Exposure: 0.274 mg/kg bw/day RCR: 0.023
Combined routes: RCR: 0.126
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Article formation (injection moulding) (PROC 14)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 3.429 mg/kg bw/day RCR: 0.291
Combined routes: RCR: 0.803
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Maintenance of equipment (PROC 8a)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 0.027 mg/kg bw/day RCR: 0.002
Combined routes: RCR: 0.259
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Inhalation: Exposure: 14.9 mg/m³ RCR: 0.18
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.296
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Acute systemic
A risk characterisation for short term duration (short term event, peak exposure) was not conducted as an Acute toxicity hazard leading to classification & labelling has not been identified.

Local effects via inhalation route
For the acute exposure, no RCR values have been calculated as the risks resulting from short-term exposure are covered by the long-term assessment

Contributing scenario: Bulk transfers of polymer prill/pellet etc to/from storage (PROC 2)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Semi-bulk transfers to/from storage e.g. IBCs, big bags (PROC 8b)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: Article formation (injection moulding) (PROC 6)
Long term: Exposure: 8.515 mg/m³ RCR: 0.103
Exposure estimation Method: Extended TRA workers

Contributing scenario: Article formation (injection moulding) (PROC 14)
Long term: Exposure: 42.57 mg/m³ RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Maintenance of equipment (PROC 8a)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Long term: Exposure: 14.9 mg/m³ RCR: 0.18
Exposure estimation Method: Extended TRA workers

Local effects via dermal route
A DNEL for local effects of acute dermal exposure was not derived as an acute toxicity hazard has not been identified. For local effects of long-term dermal exposure, a DNEL was not derived as there is no information available about threshold effects and/or dose-response. Consequently, RCR values were not calculated for both exposure patterns.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
The Use Descriptors assigned based on the ECHA guidance on use descriptors R-12 represent the current understanding of the uses of our product

(http://echa.europa.eu/documents/10162/13632/information_requirements_r12_en.pdf).

Please carefully consider whether the listed Exposure Scenarios reflect your uses of Celanese's product. Different uses can be addressed in the same exposure scenario if the same operational conditions and risk management measures apply to all these uses. In addition, various types of activities can be expressed by one category for workers' exposure and one category for environmental exposure.
ECHA's "Guidance for Downstream Users" provides details how to decide whether or not your use is covered by the exposure scenarios and what to do if this is not the case

(http://echa.europa.eu/documents/10162/13634/du_en.pdf).

13. Industrial end-use (SU 3); Mining chemicals; Mining chemicals; PC 40

Title of Exposure scenario Industrial end-use (SU 3); Mining chemicals; Mining chemicals; PC 40

Environment: Mining chemicals ERC 4

Worker

Bulk transfers (e.g. from IBCs) PROC 2
Metered charge from drums PROC 8b
Hand addition of solvent extractment and additive packages PROC 9
General exposures ; solvent mixing and extraction of leach solutions (PLS) - enclosed systems PROC 3
General exposures ; solvent mixing and extraction of leach solutions (PLS) - open systems PROC 5
Phase sepatation of leach and raffinate liquors PROC 4
Ion exchange processes PROC 2
Sample collection PROC 3
In-line injection (of process chemicals) by fixed dosing pumps PROC 1
Clean down and maintenance PROC 8a
Storage PROC 1

2. Conditions of use affecting exposure

2.1 Control of environmental exposure: Mining chemicals (ERC 4)

Amounts used
Daily amount per site <= 0.19 tonnes/day
Annual amount per site <= 3.8 tonnes/year

Other given operational conditions affecting environmental exposure
Receiving river flow rate >= 1.8E4 m3/d

Conditions and measures related to municipal sewage treatment plant
Wastewater is to be treated by a municipal STP.
Municipal STP discharge rate < 2E3 m3/d

2.2 Control of workers exposure for Bulk transfers (e.g. from IBCs) (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

2.3 Control of workers exposure for Metered charge from drums (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.

2.4 Control of workers exposure for Hand addition of solvent extractment and additive packages (PROC 9)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Enclosed substance transfer points.

2.5 Control of workers exposure for General exposures ; solvent mixing and extraction of leach solutions (PLS) - enclosed systems (PROC 3)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed batch process. All substance transfers closed. No regular manual interventions.

2.6 Control of workers exposure for General exposures ; solvent mixing and extraction of leach solutions (PLS) - open systems (PROC 5)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditi_ns and measures
Partially closed mixing and blending of chemicals. No open substance transfers.

2.7 Control of workers exposure for Phase sepatation of leach and raffinate liquors (PROC 4)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed batch manufacturing process. No open substance transfers.

2.8 Control of workers exposure for Ion exchange processes (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

2.9 Control of workers exposure for Sample collection (PROC 3)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed batch process. All substance transfers closed. No regular manual interventions.

2.10 Control of workers exposure for In-line injection (of process chemicals) by fixed dosing pumps (PROC 1)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed system. No contact to substance.

2.11 Control of workers exposure for Clean down and maintenance (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.12 Control of workers exposure for Storage (PROC 1)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed system. No contact to substance.

3. Exposure estimation and reference to its source

Environment

Release route	**Release rate (kg/day)**	**Release estimation method**
Water	95	Other method - SPERC ESVOC 49
Air	9.5	Other method - SPERC ESVOC 49
Soil	0	Other method - SPERC ESVOC 49

Protection target	**Exposure estimate** (based on: EUSES 2.0)	**RCR**
Freshwater (pelagic)	0.594 mg/L	0.99
Freshwater (sediment)	2.91 mg/kg dw	0.99
Marine water (pelagic)	0.059 mg/L	0.99
Marine water (sediment)	0.291 mg/kg dw	0.97
Freshwater food chain (predators)	#	#
Marine water food chain (predators)	#	#
Marine water food chain (top predators)	#	#
Effluent	5.93 mg/L	0.059
Agricultural soil	0.149 mg/kg dw	0.621
Terrestrial food chain (predator)	#	#

Not required as an accumulation via the food chain is not expected

Risk characterisation for man via the environment
Not required as an accumulation via the food chain is not expected.

Worker exposure

Long-term, systemic

Contributing scenario: Bulk transfers (e.g. from IBCs) (PROC 2)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.168
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Metered charge from drums (PROC 8b)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Hand addition of solvent extractment and additive packages (PROC 9)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: General exposures ; solvent mixing and extraction of leach solutions (PLS) - enclosed systems (PROC 3)
Inhalation: Exposure: 12.77 mg/m³ RCR: 0.154
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.183
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: General exposures ; solvent mixing and extraction of leach solutions (PLS) - open systems (PROC 5)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.489
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Phase sepatation of leach and raffinate liquors (PROC 4)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Ion exchange processes (PROC 2)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.168
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Sample collection (PROC 3)
Inhalation: Exposure: 12.77 mg/m³ RCR: 0.154
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.183
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: In-line injection (of process chemicals) by fixed dosing pumps (PROC 1)
Inhalation: Exposure: 0.043 mg/m³ RCR: 5.181E-4
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.03
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Clean down and maintenance (PROC 8a)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.745
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Storage (PROC 1)
Inhalation: Exposure: 0.043 mg/m³ RCR: 5.181E-4
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.03
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Acute systemic
A risk characterisation for short term duration (short term event, peak exposure) was not conducted as an Acute toxicity hazard leading to classification & labelling has not been identified.

Local effects via inhalation route
For the acute exposure, no RCR values have been calculated as the risks resulting from short-term exposure are covered by the long-term assessment

Contributing scenario: Bulk transfers (e.g. from IBCs) (PROC 2)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: Metered charge from drums (PROC 8b)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Hand addition of solvent extractment and additive packages (PROC 9)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: General exposures ; solvent mixing and extraction of leach solutions (PLS) - enclosed systems (PROC 3)
Long term: Exposure: 12.77 mg/m³ RCR: 0.154
Exposure estimation Method: Extended TRA workers

Contributing scenario: General exposures ; solvent mixing and extraction of leach solutions (PLS) - open systems (PROC 5)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Phase sepatation of leach and raffinate liquors (PROC 4)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Ion exchange processes (PROC 2)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers
Contributing scenario: Sample collection (PROC 3)
Long term: Exposure: 12.77 mg/m³ RCR: 0.154
Exposure estimation Method: Extended TRA workers

Contributing scenario: In-line injection (of process chemicals) by fixed dosing pumps (PROC 1)
Long term: Exposure: 0.043 mg/m³ RCR: 5.181E-4
Exposure estimation Method: Extended TRA workers

Contributing scenario: Clean down and maintenance (PROC 8a)
Long term: Exposure: 42.57 mg/m³ RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Storage (PROC 1)
Long term: Exposure: 0.043 mg/m³ RCR: 5.181E-4
Exposure estimation Method: Extended TRA workers

Local effects via dermal route
A DNEL for local effects of acute dermal exposure was not derived as an acute toxicity hazard has not been identified. For local effects of long-term dermal exposure, a DNEL was not derived as there is no information available about threshold effects and/or dose-response. Consequently, RCR values were not calculated for both exposure patterns.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The Use Descriptors assigned based on the ECHA guidance on use descriptors R-12 represent the current understanding of the uses of our product

(http://echa.europa.eu/documents/10162/13632/information_requirements_r12_en.pdf).

Please carefully consider whether the listed Exposure Scenarios reflect your uses of Celanese's product. Different uses can be addressed in the same exposure scenario if the same operational conditions and risk management measures apply to all these uses. In addition, various types of activities can be expressed by one category for workers' exposure and one category for environmental exposure.
ECHA's "Guidance for Downstream Users" provides details how to decide whether or not your use is covered by the exposure scenarios and what to do if this is not the case

(http://echa.europa.eu/documents/10162/13634/du_en.pdf).

14. Industrial end-use (SU 3); Use as intermediate and as a processing aid

Title of Exposure scenario Industrial end-use (SU 3); Use as intermediate and as a processing aid

Environment: Use as intermediate and as a processing aid ERC 6a

Worker

General process exposures (no sampling) PROC 1
General process exposures and sample collection PROC 2
General process exposures PROC 3
General exposures open batch process PROC 4
Sample collection PROC 8b
Laboratory activities PROC 15
Bulk transfers (no LEV) PROC 8b
Bulk transfers (with LEV) PROC 8b
Clean down and maintenance PROC 8a
Storage PROC 2

2. Conditions of use affecting exposure

2.1 Control of environmental exposure: Use as intermediate and as a processing aid (ERC 6a)

Amounts used
Daily amount per site <= 9.5 tonnes/day
Annual amount per site <= 2.85E3 tonnes/year

Other given operational conditions affecting environmental exposure
Receiving river flow rate >= 1.8E4 m3/d

Conditions and measures related to municipal sewage treatment plant
Wastewater is to be treated by a municipal STP.
Municipal STP discharge rate < 2E3 m3/d
Municipal STP sludge not applied to agricultul soil

2.2 Control of workers exposure for General process exposures (no sampling) (PROC 1)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed system. No contact to substance.

2.3 Control of workers exposure for General process exposures and sample collection (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

2.4 Control of workers exposure for General process exposures (PROC 3)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

Technical and organisational conditions and measures
Closed batch process. All substance transfers closed. No regular manual interventions.

2.5 Control of workers exposure for General exposures open batch process (PROC 4)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed batch manufacturing process. No open substance transfers.

2.6 Control of workers exposure for Sample collection (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.

2.7 Control of workers exposure for Laboratory activities (PROC 15)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: One hand face only (240 cm2)

2.8 Control of workers exposure for Bulk transfers (no LEV) (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.

2.9 Control of workers exposure for Bulk transfers (with LEV) (PROC 8b)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature
Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Partially closed substance transfers and control of exhaust air.
Provide extract ventilation to points where emissions occur. Effectiveness [Effectiveness Inhalation: 97% ; Dermal: 90%]

2.10 Control of workers exposure for Clean down and maintenance (PROC 8a)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Process at room temperature

Good general ventilation at workplace assumed.
Indoor use assumed
Exposed skin surface assumed: Two hands (960 cm2)

2.11 Control of workers exposure for Storage (PROC 2)
Product characteristics
Covers percentage substance in the product up to 100 % (unless stated differently)

Amount used, frequency and duration of use/exposure
Operation carried out for <= 8 hours

Other operational conditions affecting workers exposure
Good general ventilation at workplace assumed.
Use outdoors
Exposed skin surface assumed: Two hands face (480 cm2)

Technical and organisational conditions and measures
Closed continuous process. All substance transfers closed. No regular manual interventions.

3. Exposure estimation and reference to its source

Environment

Release route	**Release rate (kg/day)**	**Release estimation method**
Water	95	Other method - SPERC ESVOC 2
Air	1.9	Other method - SPERC ESVOC 2
Soil	0	Other method - SPERC ESVOC 2

Protection target	**Exposure estimate** (based on: EUSES 2.0)	**RCR**
Freshwater (pelagic)	0.594 mg/L	0.99
Freshwater (sediment)	2.91 mg/kg dw	0.99
Marine water (pelagic)	0.059 mg/L	0.99
Marine water (sediment)	0.291 mg/kg dw	0.97
Freshwater food chain (predators)	#	#
Marine water food chain (predators)	#	#
Marine water food chain (top predators)	#	#
Effluent	5.93 mg/L	0.059
Agricultural soil	8.42E-5 mg/kg dw	0
Terrestrial food chain (predator)	#	#

Not required as an accumulation via the food chain is not expected

Risk characterisation for man via the environment
Not required as an accumulation via the food chain is not expected.

Worker exposure

Long-term, systemic

Contributing scenario: General process exposures (no sampling) (PROC 1)
Inhalation: Exposure: 0.043 mg/m³ RCR: 5.181E-4
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.03
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: General process exposures and sample collection (PROC 2)
Inhalation: Exposure: 4.257 mg/m³ RCR: 0.051
Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.168
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: General process exposures (PROC 3)
Inhalation: Exposure: 12.77 mg/m³ RCR: 0.154
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.183
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: General exposures open batch process (PROC 4)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Sample collection (PROC 8b)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers
par**Contributing scenario:** Laboratory activities (PROC 15)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 0.343 mg/kg bw/day RCR: 0.029
Combined routes: RCR: 0.286
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Bulk transfers (no LEV) (PROC 8b)
Inhalation: Exposure: 21.29 mg/m³ RCR: 0.256
Dermal: Exposure: 6.857 mg/kg bw/day RCR: 0.581
Combined routes: RCR: 0.838
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Bulk transfers (with LEV) (PROC 8b)
Inhalation: Exposure: 0.639 mg/m³ RCR: 0.008
Dermal: Exposure: 0.686 mg/kg bw/day RCR: 0.058
Combined routes: RCR: 0.066
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Clean down and maintenance (PROC 8a)
Inhalation: Exposure: 42.57 mg/m³ RCR: 0.513
Dermal: Exposure: 2.743 mg/kg bw/day RCR: 0.232
Combined routes: RCR: 0.745
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Inhalation: Exposure: 2.98 mg/m³ RCR: 0.036

Dermal: Exposure: 1.371 mg/kg bw/day RCR: 0.116
Combined routes: RCR: 0.152
Exposure estimation Method: Inhal: Extended TRA workers Derm: Extended TRA workers

Acute systemic
A risk characterisation for short term duration (short term event, peak exposure) was not conducted as an Acute toxicity hazard leading to classification & labelling has not been identified.

Local effects via inhalation route
For the acute exposure, no RCR values have been calculated as the risks resulting from short-term exposure are covered by the long-term assessment

Contributing scenario: General process exposures (no sampling) (PROC 1)
Long term: Exposure: 0.043 mg/m³ RCR: 5.181E-4
Exposure estimation Method: Extended TRA workers

Contributing scenario: General process exposures and sample collection (PROC 2)
Long term: Exposure: 4.257 mg/m³ RCR: 0.051
Exposure estimation Method: Extended TRA workers

Contributing scenario: General process exposures (PROC 3)
Long term: Exposure: 12.77 mg/m³ TAB RCR: 0.154
Exposure estimation Method: Extended TRA workers

Contributing scenario: General exposures open batch process (PROC 4)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Sample collection (PROC 8b)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Laboratory activities (PROC 15)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Bulk transfers (no LEV) (PROC 8b)
Long term: Exposure: 21.29 mg/m³ RCR: 0.256
Exposure estimation Method: Extended TRA workers

Contributing scenario: Bulk transfers (with LEV) (PROC 8b)
Long term: Exposure: 0.639 mg/m³ RCR: 0.008
Exposure estimation Method: Extended TRA workers

Contributing scenario: Clean down and maintenance (PROC 8a)
Long term: Exposure: 42.57 mg/m³ RCR: 0.513
Exposure estimation Method: Extended TRA workers

Contributing scenario: Storage (PROC 2)
Long term: Exposure: 2.98 mg/m³ RCR: 0.036
Exposure estimation Method: Extended TRA workers

Local effects via dermal route
A DNEL for local effects of acute dermal exposure was not derived as an acute toxicity hazard has not been identified. For local effects of long-term dermal exposure, a DNEL was not derived as there is no information available about threshold effects and/or dose-response. Consequently, RCR values were not calculated for both exposure patterns.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES
The Use Descriptors assigned based on the ECHA guidance on use descriptors R-12 represent the current understanding of the uses of our product

(http://echa.europa.eu/documents/10162/13632/information_requirements_r12_en.pdf).

Please carefully consider whether the listed Exposure Scenarios reflect your uses of Celanese's product. Different uses can be addressed in the same exposure scenario if the same operational conditions and risk management measures apply to all these uses. In addition, various types of activities can be expressed by one category for workers' exposure and one category for environmental exposure.
ECHA's "Guidance for Downstream Users" provides details how to decide whether or not your use is covered by the exposure scenarios and what to do if this is not the case

(http://echa.europa.eu/documents/10162/13634/du_en.pdf).

APPENDIX 3C-16

Chemical & Mining Services Pty Limited

Material Safety Data Sheet – IF50

MATERIAL SAFETY DATA SHEET

Date of issue 21.03.2012

STATEMENT OF HAZARDOUS NATURE

'Non Hazardous according to criteria of Worksafe Australia'

COMPANY DETAILS

Company: Chemical & Mining Services Pty Limited
Address: Suite 12, 16-18 Malvern Avenue, Chatswood NSW 2067
Telephone: +61 2 9904 6806 Facsimile: +61 2 9904 6803
24 Hour Emergency Response Service: CHEMWATCH - 1800 039 008

IDENTIFICATION

Product:	**INTERFROTH®50**
Manufacturers' Product Code:	**IF50**
UN Number:	**N/A**
Dangerous Goods Class, etc:	**N/A**
Packaging Group:	**N/A**
Hazchem Code:	**N/A**
Poisons Schedule Number:	**N/A**
Use:	**Flotation Frother**

Physical Description/Properties

Appearance:	**Orange/Brown to Red Brown Liquid**
Boiling Point Range:	**100 - 170°C**
Vapour Pressure:	**15mm HG @ 37.8ºC**
Viscosity:	**1.21 mPa @ 20ºC**
Specific Gravity:	**0.91**
Flash Point:	**65°C**
Solubility in Water:	**1.4% (approx)**
Flammability Limits:	**2.1 – 15%**
Conductivity:	**<15uS**

Other Properties

Ingredients
Chemical Name
Polymerisation and Distillation Product of 1,1,3 Triethoxybutane, Alcohols and Esters

***INTERFROTH® is the registered trade name of Chemical & Mining Services Pty Limited**

HEALTH HAZARD INFORMATION

Health Effects
Acute:

Swallowed:	**May cause gastrointestinal irritation.**
Eye:	**Strong irritant may cause burns.**
Skins:	**May cause defatting. Prolonged contact may cause dermatitis.**
Inhaled:	**High concentration of vapour may cause irritation to respiratory tract.**

Chronic:

First Aid:

Swallowed:	**Drink copious quantities of water. Do not induce vomiting. Seek medical attention immediately.**
Eye:	**Flush immediately with water for 15 minutes. Refer residual irritation to a physician.**
Skin:	**Wash well with soap and water. Remove contaminated clothing.**
Inhaled:	**Move victim to fresh air. If exposure is severe oxygen may be needed.**

PRECAUTIONS FOR USE

Exposure Standards:	**Operate in a well ventilated area using normal protective clothing.**
Engineering Controls:	**Do not use rubber products as they will swell.**
Personal Protection:	**Use goggles, gloves and boots.**
Flammability:	**Flash Point is 65°C (Do not use naked flame).**

SAFE HANDLING INFORMATION

Storage and Transport:

INTERFROTH®50 should be stored in HDPE, mild steel, or stainless steel tanks.

Do NOT store in PVC or Synthetic rubber vessels.

The storage area should be cool and well ventilated. The product should be protected from sources of ignition, heat or powerful oxidizing agents. Keep containers tightly closed when not in use. Avoid contact with water during storage.

The product should be handled in a well ventilated area, protective clothing, including safety glasses and gloves should be worn.

Conditions to avoid:

- **Do not weld, cut, grind or drill on or near drums or bulk tanks.**
- **Keep well away from naked flame, incompatible materials or oxidizing agents.**
- **Avoid contact with PVC and synthetic rubbers.**

Spills and Disposal:

Small spills: Shut off all sources of ignition. Wear protective clothing, eye protection and self-contained breathing apparatus. If the spill or leak is small, a full facepiece air purifying cartridge respirator equipped for organic vapours is satisfactory. Absorb onto sand or absorbent paper and transport to the open air for eventual disposal. Wash spill site thoroughly with soap and water, and ventilate the area well.

Large spills: Contain by dyking with soil or other non-combustible sorbent material and then pump into approved waste containers; or absorb with non-combustible sorbent material and place residue in approved waste containers. Transport

contaminated product and cleaning materials to a controlled site for disposal. Wash spill site with a large volume of water and allow to drain (or pump) into an approved water treatment system.

Additional Advice: Comply with all local regulations on spill reporting, handling and disposal of waste.

Fire/Explosion Hazard:

Extinguishing Media: **CO_2, water spray and foam. Use water spray to cool nearby containers and structures.**

Special Hazards: **INTERFROTH®50 is combustible, having a flash point of 65°C (min).**

At elevated temperature in an enclosed space, ignited vapours may explode. Flammability limits 15mm HG @ 37.8°C.

Protective Clothing: **Fire fighters should wear self-contained breathing apparatus and full protective clothing.**

OTHER INFORMATION

Environmental Precautions: **Contain, prevent liquid entering sewers, water courses and rivers, basements and workpits and soil. Sewers must be covered and basements/workpits evacuated.**

Discharge of high concentrations into waterways can affect aquatic life. Normal effluent from tailings dams is considered safe.

EXCLUSION OF LIABILITY

Information contained in this material safety data sheet is accurate at the date of publication to the best of the knowledge of Chemical & Mining Services Pty Limited. The company does not accept any liability whatsoever arising from the use of this information, or the use, application, adaption or processing of any products described herein.

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