

Certificate of Analysis

Client: Shetland Islands Council

Project: 23122166

Quote: BEC231132598 V1.1

Project Ref: Shetland Islands Council

Site: Shetland Islands Council-Energy

Contact: redacted

Address: Lerwick Energy Recovery Plant
Greenhead Base
Gremista Industrial Estate
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No. Samples Received: 5

Date Received: 19/12/2023

Analysis Date: 06/02/2024

Date Issued: 06/02/2024

Report Type: Final Version 01

This report supersedes any versions previously issued by the laboratory

redacted



Client: Shetland Islands Council
Project Name: Shetland Islands Council-Shetland Islands Council-Energy
Project No: 23122166
Date Issued: 06/02/2024

Samples Analysed

<u>Text ID</u>	<u>Sample Reference</u>	<u>Sampling Date</u>	<u>Sample Type</u>	<u>Sample Description</u>
23122166-001	Bottom Ash	06/12/2023 10:00:00	SOLID	Soil Sample
23122166-002	ESP	06/12/2023 10:00:00	SOLID	Soil Sample
23122166-003	Bag Filter	06/12/2023 10:00:00	SOLID	Soil Sample
23122166-004	Filter Press	06/12/2023 10:00:00	SOLID	Soil Sample
23122166-005	Effluent	06/12/2023 14:00:00	WATER	Unclassified Liquid

Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	001		002		003		004
					Customer ID	Bottom Ash		ESP		Bag Filter		Filter Press
					Sample Type	LPL	SOLID	LPL	SOLID	LPL	SOLID	LPL
					Sampling Date	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023
Antimony as Sb	ICPMSW (Dissolved)	0.01	mg/kg [^]	N		<0.01		<0.01		<0.01		0.24
Arsenic as As	ICPMSW (Dissolved)	0.01	mg/kg [^]	N		<0.01		0.37		<0.01		<0.01
Barium as Ba	ICPWATVAR (Dissolved)	0.1	mg/kg [^]	N		2.5		<0.1		4.0		0.2
Cadmium as Cd	ICPMSW (Dissolved)	0.0002	mg/kg [^]	N		<0.0002		0.532		<0.0002		<0.0002
Chloride as Cl	KONENS	10	mg/kg [^]	N		4870		130000		4300		3730
Total Chromium as Cr	ICPMSW (Dissolved)	0.01	mg/kg [^]	N		0.44		0.02		0.24		<0.01
Copper as Cu	ICPMSW (Dissolved)	0.01	mg/kg [^]	N		4.52		2.62		<0.01		<0.01
Lead as Pb	ICPMSW (Dissolved)	0.01	mg/kg [^]	N		16.7		170		0.79		<0.01
Mercury as Hg	ICPMSW (Dissolved)	0.0003	mg/kg [^]	N		0.0003		0.0008		0.0010		0.0011
Molybdenum as Mo	ICPMSW (Dissolved)	0.01	mg/kg [^]	N		1.42		6.08		0.14		0.11
Nickel as Ni	ICPMSW (Dissolved)	0.01	mg/kg [^]	N		<0.01		<0.01		<0.01		<0.01
Phenol Index	SFAPI	0.5	mg/kg [^]	N		<0.5		3.1		<0.5		<0.5
Selenium as Se	ICPMSW (Dissolved)	0.01	mg/kg [^]	N		0.03		0.24		0.19		<0.01
Total Sulphur as SO ₄	ICPWATVAR (Dissolved)	30	mg/kg [^]	N		10600		77700		19800		15400
TDS as mg/kg	PHCONDW	700	mg/kg [^]	N		70200		270000		79600		20400
Leached Organic Carbon	WSLM13	2	mg/kg [^]	N		62.7		6.5		246		10.0
Fluoride as F	ISEF	1	mg/kg [^]	N		6		45		3		42
Zinc as Zn	ICPMSW (Dissolved)	0.02	mg/kg [^]	N		15.2		23.7		2.43		0.04
Conductivity at 25°C	PHCONDW	100	µS/cm	N		10300		39700		11700		3050

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Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	
					Customer ID	
					Sample Type	
					Sampling Date	
					004	005
					Filter Press	Effluent
					SOLID	WATER
					06/12/2023	06/12/2023
Antimony as Sb	ICPMSW (Dissolved)	0.01	mg/kg^	N		
Arsenic as As	ICPMSW (Dissolved)	0.01	mg/kg^	N		
Barium as Ba	ICPWATVAR (Dissolved)	0.1	mg/kg^	N		
Cadmium as Cd	ICPMSW (Dissolved)	0.0002	mg/kg^	N		
Chloride as Cl	KONENS	10	mg/kg^	N		
Total Chromium as Cr	ICPMSW (Dissolved)	0.01	mg/kg^	N		
Copper as Cu	ICPMSW (Dissolved)	0.01	mg/kg^	N		
Lead as Pb	ICPMSW (Dissolved)	0.01	mg/kg^	N		
Mercury as Hg	ICPMSW (Dissolved)	0.0003	mg/kg^	N		
Molybdenum as Mo	ICPMSW (Dissolved)	0.01	mg/kg^	N		
Nickel as Ni	ICPMSW (Dissolved)	0.01	mg/kg^	N		
Phenol Index	SFAPI	0.5	mg/kg^	N		
Selenium as Se	ICPMSW (Dissolved)	0.01	mg/kg^	N		
Total Sulphur as SO4	ICPWATVAR (Dissolved)	30	mg/kg^	N		
TDS as mg/kg	PHCONDW	700	mg/kg^	N		
Leached Organic Carbon	WSLM13	2	mg/kg^	N		
Fluoride as F	ISEF	1	mg/kg^	N		
Zinc as Zn	ICPMSW (Dissolved)	0.02	mg/kg^	N		
Conductivity at 25°C	PHCONDW	100	µS/cm	N		



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Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	001		002		003		004
					Customer ID	Bottom Ash		ESP		Bag Filter		Filter Press
					Sample Type	LPL	SOLID	LPL	SOLID	LPL	SOLID	LPL
					Sampling Date	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023
pH	PHCONDW	1	pH units	N		>12.0 E		>12.0 E		>12.0 E		9.6
TDS as mg/l	PHCONDW	70	mg/l	N		7020		27000		7960		2070
Chloride as Cl	KONENS	1	mg/l	U		487		13000		430		378
Phenol Index	SFAP1	0.05	mg/l	U		<0.05		0.31		<0.05		<0.05
Fluoride as F	ISEF	0.1	mg/l	U		0.6		4.5		0.3		4.2
Total Organic Carbon	WSLM59	0.02	% m/m	U			1.36*		0.52*		17.4*	
LOI @ 450°C	LOI(%MM)	0.2	% m/m	N			2.7		1.1		14.6	
Leached Organic Carbon	TOCW	0.4	mg/l	U		6.27		0.65		24.6		1.01
Antimony as Sb	ICPMSS	0.1	mg/kg	N			78.3					
Thallium as Tl	ICPMSS	0.1	mg/kg	N			<0.1		1.5		<0.1	
Antimony as Sb	ICPSOIL	20	mg/kg	N					1350		<20.0	
Arsenic as As	ICPSOIL	20	mg/kg	N			71.9		199		32.4	
Cadmium as Cd	ICPSOIL	1	mg/kg	N			9.49		489		17.5	
Cobalt as Co	ICPSOIL	2	mg/kg	N			131		37.5		5.04	
Copper as Cu	ICPSOIL	5	mg/kg	N			3300		1640		102	
Lead as Pb	ICPSOIL	10	mg/kg	N			736		6420		157	
Manganese as Mn	ICPSOIL	10	mg/kg	N			1420		765		74.1	
Mercury as Hg	ICPSOIL	10	mg/kg	N			28.0		10.7		26.4	
Nickel as Ni	ICPSOIL	5	mg/kg	N			183		163		15.6	

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Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	
					Customer ID	
					Sample Type	
					Sampling Date	
					004	005
					Filter Press	Effluent
					SOLID	WATER
					06/12/2023	06/12/2023
pH	PHCONDW	1	pH units	N		
TDS as mg/l	PHCONDW	70	mg/l	N		
Chloride as Cl	KONENS	1	mg/l	U		
Phenol Index	SFAPI	0.05	mg/l	U		
Fluoride as F	ISEF	0.1	mg/l	U		
Total Organic Carbon	WSLM59	0.02	% m/m	U		
LOI @ 450°C	LOI(%MM)	0.2	% m/m	N		
Leached Organic Carbon	TOCW	0.4	mg/l	U		
Antimony as Sb	ICPMSS	0.1	mg/kg	N		
Thallium as Tl	ICPMSS	0.1	mg/kg	N	<0.1	
Antimony as Sb	ICPSOIL	20	mg/kg	N	<20.0	
Arsenic as As	ICPSOIL	20	mg/kg	N	<20.0	
Cadmium as Cd	ICPSOIL	1	mg/kg	N	10.7	
Cobalt as Co	ICPSOIL	2	mg/kg	N	2.07	
Copper as Cu	ICPSOIL	5	mg/kg	N	16.4	
Lead as Pb	ICPSOIL	10	mg/kg	N	84.7	
Manganese as Mn	ICPSOIL	10	mg/kg	N	93.3	
Mercury as Hg	ICPSOIL	10	mg/kg	N	24.3	
Nickel as Ni	ICPSOIL	5	mg/kg	N	16.2	

Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	001		002		003		004
					Customer ID	Bottom Ash		ESP		Bag Filter		Filter Press
					Sample Type	LPL	SOLID	LPL	SOLID	LPL	SOLID	LPL
					Sampling Date	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023
Total Chromium as Cr	ICPSOIL	5	mg/kg	N			177		101		<5.00	
Antimony as Sb	ICPMSW (Dissolved)	0.001	mg/l	U		<0.001		<0.001		<0.001		0.024
Arsenic as As	ICPMSW (Dissolved)	0.001	mg/l	U		<0.001		0.037		<0.001		<0.001
Cadmium as Cd	ICPMSW (Dissolved)	0.00002	mg/l	U		<0.00002		0.0532		<0.00002		<0.00002
Total Chromium as Cr	ICPMSW (Dissolved)	0.001	mg/l	U		0.044		0.002		0.024		0.001
Copper as Cu	ICPMSW (Dissolved)	0.001	mg/l	U		0.452		0.262		0.001		<0.001
Lead as Pb	ICPMSW (Dissolved)	0.001	mg/l	U		1.67		17.0		0.079		<0.001
Mercury as Hg	ICPMSW (Dissolved)	0.00003	mg/l	U		0.00003		0.00008		0.00010		0.00011
Molybdenum as Mo	ICPMSW (Dissolved)	0.001	mg/l	U		0.142		0.608		0.014		0.011
Nickel as Ni	ICPMSW (Dissolved)	0.001	mg/l	U		<0.001		<0.001		<0.001		<0.001
Selenium as Se	ICPMSW (Dissolved)	0.001	mg/l	U		0.003		0.024		0.019		<0.001
Zinc as Zn	ICPMSW (Dissolved)	0.002	mg/l	U		1.52		2.37		0.243		0.004
Barium as Ba	ICPWATVAR (Dissolved)	0.01	mg/l	U		0.25		<0.01		0.40		0.02
Total Sulphur as SO4	ICPWATVAR (Dissolved)	3	mg/l	U		1060		7770		1980		1560
Acenaphthene	PAHMSUS	0.08	mg/kg	U			<0.08*		<0.08*		<0.08* c	
Acenaphthylene	PAHMSUS	0.08	mg/kg	U			<0.08*		<0.08*		<0.08* c	
Anthracene	PAHMSUS	0.08	mg/kg	U			<0.08*		<0.08*		<0.08* c	
Benzo[a]anthracene	PAHMSUS	0.08	mg/kg	U			<0.08*		<0.08*		<0.08* c	
Benzo[a]pyrene	PAHMSUS	0.08	mg/kg	U			<0.08*		<0.08*		<0.08* c	

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Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	004	005
					Customer ID	Filter Press	Effluent
					Sample Type	SOLID	WATER
					Sampling Date	06/12/2023	06/12/2023
Total Chromium as Cr	ICPSOIL	5	mg/kg	N		9.29	
Antimony as Sb	ICPMSW (Dissolved)	0.001	mg/l	U			
Arsenic as As	ICPMSW (Dissolved)	0.001	mg/l	U			
Cadmium as Cd	ICPMSW (Dissolved)	0.00002	mg/l	U			
Total Chromium as Cr	ICPMSW (Dissolved)	0.001	mg/l	U			
Copper as Cu	ICPMSW (Dissolved)	0.001	mg/l	U			
Lead as Pb	ICPMSW (Dissolved)	0.001	mg/l	U			
Mercury as Hg	ICPMSW (Dissolved)	0.00003	mg/l	U			
Molybdenum as Mo	ICPMSW (Dissolved)	0.001	mg/l	U			
Nickel as Ni	ICPMSW (Dissolved)	0.001	mg/l	U			
Selenium as Se	ICPMSW (Dissolved)	0.001	mg/l	U			
Zinc as Zn	ICPMSW (Dissolved)	0.002	mg/l	U			
Barium as Ba	ICPWATVAR (Dissolved)	0.01	mg/l	U			
Total Sulphur as SO4	ICPWATVAR (Dissolved)	3	mg/l	U			
Acenaphthene	PAHMSUS	0.08	mg/kg	U		<0.08*	
Acenaphthylene	PAHMSUS	0.08	mg/kg	U		<0.08*	
Anthracene	PAHMSUS	0.08	mg/kg	U		<0.08*	
Benzo[a]anthracene	PAHMSUS	0.08	mg/kg	U		<0.08*	
Benzo[a]pyrene	PAHMSUS	0.08	mg/kg	U		<0.08*	

Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	001		002		003		004
					Customer ID	Bottom Ash		ESP		Bag Filter		Filter Press
					Sample Type	LPL	SOLID	LPL	SOLID	LPL	SOLID	LPL
					Sampling Date	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023
Benzo[b]fluoranthene	PAHMSUS	0.08	mg/kg	U			<0.08*		<0.08*		<0.08* c	
Benzo[g,h,i]perylene	PAHMSUS	0.08	mg/kg	U			<0.08*		<0.08*		<0.08* c	
Benzo[k]fluoranthene	PAHMSUS	0.08	mg/kg	U			<0.08*		<0.08*		<0.08* c	
Chrysene	PAHMSUS	0.08	mg/kg	U			<0.08*		<0.08*		<0.08* c	
Dibenzo[a,h]anthracene	PAHMSUS	0.08	mg/kg	U			<0.08*		<0.08*		<0.08* c	
Fluoranthene	PAHMSUS	0.08	mg/kg	U			<0.08*		<0.08*		<0.08* c	
Fluorene	PAHMSUS	0.08	mg/kg	U			<0.08*		<0.08*		<0.08* c	
Indeno[1,2,3-cd]pyrene	PAHMSUS	0.08	mg/kg	U			<0.08*		<0.08*		<0.08* c	
Naphthalene	PAHMSUS	0.08	mg/kg	U			<0.08*		<0.08*		0.46* c	
Phenanthrene	PAHMSUS	0.08	mg/kg	U			<0.08*		<0.08*		<0.08* c	
Pyrene	PAHMSUS	0.08	mg/kg	U			<0.08*		<0.08*		<0.08* c	
Total PAH 16	PAHMSUS	1.28	mg/kg	U			1.28*		1.28*		1.66* c	
Acenaphthene	PAHMSW	0.01	µg/l	U								
Acenaphthylene	PAHMSW	0.01	µg/l	U								
Anthracene	PAHMSW	0.01	µg/l	U								
Benzo[a]anthracene	PAHMSW	0.01	µg/l	U								
Benzo[a]pyrene	PAHMSW	0.01	µg/l	U								
Benzo[b]fluoranthene	PAHMSW	0.01	µg/l	U								
Benzo[g,h,i]perylene	PAHMSW	0.01	µg/l	U								

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Analysis Results

					Sample ID	004	005	
					Customer ID	Filter Press	Effluent	
						Sample Type	SOLID	WATER
						Sampling Date	06/12/2023	06/12/2023
						Analysis	Method Code	MDL
Benzo[b]fluoranthene	PAHMSUS	0.08	mg/kg	U	<0.08*			
Benzo[g,h,i]perylene	PAHMSUS	0.08	mg/kg	U	<0.08*			
Benzo[k]fluoranthene	PAHMSUS	0.08	mg/kg	U	<0.08*			
Chrysene	PAHMSUS	0.08	mg/kg	U	<0.08*			
Dibenzo[a,h]anthracene	PAHMSUS	0.08	mg/kg	U	<0.08*			
Fluoranthene	PAHMSUS	0.08	mg/kg	U	<0.08*			
Fluorene	PAHMSUS	0.08	mg/kg	U	<0.08*			
Indeno[1,2,3-cd]pyrene	PAHMSUS	0.08	mg/kg	U	<0.08*			
Naphthalene	PAHMSUS	0.08	mg/kg	U	<0.08*			
Phenanthrene	PAHMSUS	0.08	mg/kg	U	<0.08*			
Pyrene	PAHMSUS	0.08	mg/kg	U	<0.08*			
Total PAH 16	PAHMSUS	1.28	mg/kg	U	1.28*			
Acenaphthene	PAHMSW	0.01	µg/l	U		<0.01*		
Acenaphthylene	PAHMSW	0.01	µg/l	U		<0.01*		
Anthracene	PAHMSW	0.01	µg/l	U		<0.01*		
Benzo[a]anthracene	PAHMSW	0.01	µg/l	U		<0.01*		
Benzo[a]pyrene	PAHMSW	0.01	µg/l	U		<0.01*		
Benzo[b]fluoranthene	PAHMSW	0.01	µg/l	U		<0.01*		
Benzo[g,h,i]perylene	PAHMSW	0.01	µg/l	U		<0.01* A		



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Analysis Results

					Sample ID	001		002		003		004
					Customer ID	Bottom Ash		ESP		Bag Filter		Filter Press
					Sample Type	LPL	SOLID	LPL	SOLID	LPL	SOLID	LPL
					Sampling Date	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023
Analysis	Method Code	MDL	Units	Accred.								
Benzo[k]fluoranthene	PAHMSW	0.01	µg/l	U								
Chrysene	PAHMSW	0.01	µg/l	U								
Dibenzo[a,h]anthracene	PAHMSW	0.01	µg/l	U								
Fluoranthene	PAHMSW	0.01	µg/l	U								
Fluorene	PAHMSW	0.01	µg/l	U								
Indeno[1,2,3-cd]pyrene	PAHMSW	0.01	µg/l	U								
Naphthalene	PAHMSW	0.01	µg/l	U								
Phenanthrene	PAHMSW	0.01	µg/l	U								
Pyrene	PAHMSW	0.01	µg/l	U								
Total PAH 16	PAHMSW	0.16	µg/l	U								
Total Moisture at 105°C	TMSS	0.1	%	U					<0.1*		<0.1*	
Total Moisture at 35°C	CLANDPREP	0.1	%	N			3.0		<0.1		<0.1	
Colour of Material	CLANDPREP		-	N			Grey		Cream		Black/Grey	
Major Constituents	CLANDPREP		-	N			GRAVEL		ASH		ASH	
Minor Constituents	CLANDPREP		-	N			Silt		None		None	
Miscellaneous Constituents	CLANDPREP		-	N			Metal		na		na	
Equivalent Weight of Dry Material (kg)	Leachate Prep CEN 10:1		kg	N			0.090		0.090		0.090	
Fraction above 4mm (%)	Leachate Prep CEN 10:1		%	N			0		0		0	
Fraction of non-crushable material (%)	Leachate Prep CEN 10:1		%	N			0		0		0	

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Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	
					Customer ID	
					Sample Type	
					Sampling Date	
Benzo[k]fluoranthene	PAHMSW	0.01	µg/l	U	004	005
Chrysene	PAHMSW	0.01	µg/l	U	Filter Press	Effluent
Dibenzo[a,h]anthracene	PAHMSW	0.01	µg/l	U	SOLID	WATER
Fluoranthene	PAHMSW	0.01	µg/l	U	06/12/2023	06/12/2023
Fluorene	PAHMSW	0.01	µg/l	U		
Indeno[1,2,3-cd]pyrene	PAHMSW	0.01	µg/l	U		<0.01*
Naphthalene	PAHMSW	0.01	µg/l	U		<0.01*
Phenanthrene	PAHMSW	0.01	µg/l	U		<0.01*
Pyrene	PAHMSW	0.01	µg/l	U		<0.01*
Total PAH 16	PAHMSW	0.16	µg/l	U		<0.16*
Total Moisture at 105°C	TMSS	0.1	%	U		
Total Moisture at 35°C	CLANDPREP	0.1	%	N	28.5	
Colour of Material	CLANDPREP		-	N	Orange	
Major Constituents	CLANDPREP		-	N	MISCELLANEOUS	
Minor Constituents	CLANDPREP		-	N	None	
Miscellaneous Constituents	CLANDPREP		-	N	na	
Equivalent Weight of Dry Material (kg)	Leachate Prep CEN 10:1		kg	N	0.090	
Fraction above 4mm (%)	Leachate Prep CEN 10:1		%	N	0	
Fraction of non-crushable material (%)	Leachate Prep CEN 10:1		%	N	0	



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Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	001		002		003		004
					Customer ID	Bottom Ash		ESP		Bag Filter		Filter Press
					Sample Type	LPL	SOLID	LPL	SOLID	LPL	SOLID	LPL
					Sampling Date	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023
Volume of Water for 10:1 Leach (ltr)	Leachate Prep CEN 10:1		l	N			0.896		0.900		0.898	
Weight of Sample Leached (kg)	Leachate Prep CEN 10:1		kg	N			0.094		0.090		0.092	
WAC Report	WAC		-	N			See Attached		See Attached		See Attached	
1,2,3,4,6,7,8-HpCDD	SUB016		ng/kg	N			6.11400		247.59156		11516.91455	
1,2,3,4,6,7,8-HpCDF	SUB016		ng/kg	N			11.04663		138.9385		5639.97614	
1,2,3,4,7,8,9-HpCDF	SUB016		ng/kg	N			1.95381		33.31366		1193.94592	
1,2,3,4,7,8-HxCDD	SUB016		ng/kg	N			<0.6126		7.09875		883.71438	
1,2,3,4,7,8-HxCDF	SUB016		ng/kg	N			<0.55952		16.49297		1793.70996	
1,2,3,6,7,8-HxCDD	SUB016		ng/kg	N			<0.63574		19.81982		2031.24126	
1,2,3,6,7,8-HxCDF	SUB016		ng/kg	N			<0.55569		19.36493		2037.5641	
1,2,3,7,8,9-HxCDD	SUB016		ng/kg	N			<0.61457		12.25938		616.54719	
1,2,3,7,8,9-HxCDF	SUB016		ng/kg	N			1.25078		12.64803		1114.86200	
1,2,3,7,8-PCDD	SUB016		ng/kg	N			<0.47625		8.46666		1208.82203	
1,2,3,7,8-PCDF	SUB016		ng/kg	N			1.76814		6.43601		1061.72600	
2,3,4,6,7,8-HxCDF	SUB016		ng/kg	N			3.11166		31.82258		2540.09004	
2,3,4,7,8-PCDF	SUB016		ng/kg	N			1.88170		9.38575		1937.09422	
2,3,7,8-TCDD	SUB016		ng/kg	N			<0.29538		0.83873		67.95631	
2,3,7,8-TCDF	SUB016		ng/kg	N			0.80246		1.57451		722.54969	
D&Fs - TEQ (NATO) Lower	SUB016		ng/kg	N			1.77340		27.53078		3067.61647	

Client: Shetland Islands Council
Project Name: Shetland Islands Council-Shetland Islands Council-Energy
Project No: 23122166
Date Issued: 06/02/2024



Analysis Results

					Sample ID	004	005	
					Customer ID	Filter Press	Effluent	
						Sample Type	SOLID	WATER
						Sampling Date	06/12/2023	06/12/2023
						Analysis	Method Code	MDL
Volume of Water for 10:1 Leach (ltr)	Leachate Prep CEN 10:1		l	N	0.863			
Weight of Sample Leached (kg)	Leachate Prep CEN 10:1		kg	N	0.127			
WAC Report	WAC		-	N	See Attached			
1,2,3,4,6,7,8-HpCDD	SUB016		ng/kg	N	1365.1241			
1,2,3,4,6,7,8-HpCDF	SUB016		ng/kg	N	579.58934			
1,2,3,4,7,8,9-HpCDF	SUB016		ng/kg	N	150.66406			
1,2,3,4,7,8-HxCDD	SUB016		ng/kg	N	53.78536			
1,2,3,4,7,8-HxCDF	SUB016		ng/kg	N	103.40555			
1,2,3,6,7,8-HxCDD	SUB016		ng/kg	N	123.61033			
1,2,3,6,7,8-HxCDF	SUB016		ng/kg	N	109.39951			
1,2,3,7,8,9-HxCDD	SUB016		ng/kg	N	80.19375			
1,2,3,7,8,9-HxCDF	SUB016		ng/kg	N	67.49835			
1,2,3,7,8-PCDD	SUB016		ng/kg	N	47.78502			
1,2,3,7,8-PCDF	SUB016		ng/kg	N	30.23799			
2,3,4,6,7,8-HxCDF	SUB016		ng/kg	N	180.99892			
2,3,4,7,8-PCDF	SUB016		ng/kg	N	70.71436			
2,3,7,8-TCDD	SUB016		ng/kg	N	2.04898			
2,3,7,8-TCDF	SUB016		ng/kg	N	13.08894			
D&Fs - TEQ (NATO) Lower	SUB016		ng/kg	N	160.51224			



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Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	001		002		003		004
					Customer ID	Bottom Ash		ESP		Bag Filter		Filter Press
					Sample Type	LPL	SOLID	LPL	SOLID	LPL	SOLID	LPL
					Sampling Date	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023
D&Fs - TEQ (NATO) Upper	SUB016		ng/kg	N			2.60472		27.53078		3067.61647	
D&Fs - TEQ (WHO) Birds - Lower	SUB016		ng/kg	N			3.43702		32.80506		4998.83439	
D&Fs - TEQ (WHO) Birds - Upper	SUB016		ng/kg	N			4.41862		32.80506		4998.83439	
D&Fs - TEQ (WHO) Fish - Lower	SUB016		ng/kg	N			1.64540		28.38566		3632.96101	
D&Fs - TEQ (WHO) Fish - Upper	SUB016		ng/kg	N			2.84736		28.38566		3632.96101	
D&Fs - TEQ (WHO) Mammals - Lower	SUB016		ng/kg	N			1.33615		28.96199		3252.11847	
D&Fs - TEQ (WHO) Mammals - Upper	SUB016		ng/kg	N			2.40559		28.96199		3252.11847	
D&Fs - TEQ SUM - Lower	SUB016		ng/kg	N			1.33615		28.96199		3252.11847	
D&Fs - TEQ SUM - Upper	SUB016		ng/kg	N			2.40559		28.96199		3252.11847	
OCDD	SUB016		ng/kg	N			17.93447		850.16389		12347.78081	
OCDF	SUB016		ng/kg	N			18.56947		287.324		3731.74206	
PCB-105	SUB016		ng/kg	N			1.67678		4.08033		4889.54404	
PCB-114	SUB016		ng/kg	N			<0.42415		1.38218		1356.75936	
PCB-118	SUB016		ng/kg	N			4.00914		7.10453		2486.34280	
PCB-123	SUB016		ng/kg	N			<0.41021		0.55151		794.95128	
PCB-126	SUB016		ng/kg	N			<0.73967		11.34854		10565.39732	
PCB-156	SUB016		ng/kg	N			2.01486		7.08553		4383.65367	
PCB-157	SUB016		ng/kg	N			0.33132		3.12072		3212.69781	
PCB-167	SUB016		ng/kg	N			0.85117		2.92745		2018.87215	

Client: Shetland Islands Council
Project Name: Shetland Islands Council-Shetland Islands Council-Energy
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Date Issued: 06/02/2024



Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	004	005
					Customer ID	Filter Press	Effluent
					Sample Type	SOLID	WATER
					Sampling Date	06/12/2023	06/12/2023
D&Fs - TEQ (NATO) Upper	SUB016		ng/kg	N		160.51224	
D&Fs - TEQ (WHO) Birds - Lower	SUB016		ng/kg	N		203.75868	
D&Fs - TEQ (WHO) Birds - Upper	SUB016		ng/kg	N		203.75868	
D&Fs - TEQ (WHO) Fish - Lower	SUB016		ng/kg	N		171.44113	
D&Fs - TEQ (WHO) Fish - Upper	SUB016		ng/kg	N		171.44113	
D&Fs - TEQ (WHO) Mammals - Lower	SUB016		ng/kg	N		167.17224	
D&Fs - TEQ (WHO) Mammals - Upper	SUB016		ng/kg	N		167.17224	
D&Fs - TEQ SUM - Lower	SUB016		ng/kg	N		167.17224	
D&Fs - TEQ SUM - Upper	SUB016		ng/kg	N		167.17224	
OCDD	SUB016		ng/kg	N		2661.78465	
OCDF	SUB016		ng/kg	N		888.04661	
PCB-105	SUB016		ng/kg	N		17.70325	
PCB-114	SUB016		ng/kg	N		4.68355	
PCB-118	SUB016		ng/kg	N		13.42290	
PCB-123	SUB016		ng/kg	N		2.47471	
PCB-126	SUB016		ng/kg	N		58.91547	
PCB-156	SUB016		ng/kg	N		24.49000	
PCB-157	SUB016		ng/kg	N		16.48243	
PCB-167	SUB016		ng/kg	N		9.79877	



Client: Shetland Islands Council
Project Name: Shetland Islands Council-Shetland Islands Council-Energy
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Date Issued: 06/02/2024



Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	001		002		003		004
					Customer ID	Bottom Ash		ESP		Bag Filter		Filter Press
					Sample Type	LPL	SOLID	LPL	SOLID	LPL	SOLID	LPL
					Sampling Date	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023
PCB-169	SUB016		ng/kg	N			<0.03975		6.97167		4444.94348	
PCB-189	SUB016		ng/kg	N			0.47510		6.91686		4677.40204	
PCB-77	SUB016		ng/kg	N			1.58322		8.75037		8523.03537	
PCB-81	SUB016		ng/kg	N			0.34614		3.95134		5310.44431	
PCBs - TEQ (WHO) Birds - Lower	SUB016		ng/kg	N			0.11378		1.98020		2019.66205	
PCBs - TEQ (WHO) Birds - Upper	SUB016		ng/kg	N			0.18782		1.98020		2019.66205	
PCBs - TEQ (WHO) Fish - Lower	SUB016		ng/kg	N			0.00038		0.06014		56.67587	
PCBs - TEQ (WHO) Fish - Upper	SUB016		ng/kg	N			0.00408		0.06014		56.67587	
PCBs - TEQ (WHO) Mammals - Lower	SUB016		ng/kg	N			0.00054		1.34706		1193.04807	
PCBs - TEQ (WHO) Mammals - Upper	SUB016		ng/kg	N			0.07572		1.34706		1193.04807	
PCBs - TEQ SUM - Lower	SUB016		ng/kg	N			0.00054		1.34706		1193.04807	
PCBs - TEQ SUM - Upper	SUB016		ng/kg	N			0.07572		1.34706		1193.04807	
Total 2,3,7,8-Dioxins	SUB016		ng/kg	N			24.04847		1146.23879		28672.97653	
Total 2,3,7,8-Furans	SUB016		ng/kg	N			40.38465		557.30094		21773.26013	
Total PCBs	SUB016		ng/kg	N			11.28773		64.19103		52664.04363	
1,2,3,4,6,7,8-HpCDD	SUB016		ng/l	N								
1,2,3,4,6,7,8-HpCDF	SUB016		ng/l	N								
1,2,3,4,7,8,9-HpCDF	SUB016		ng/l	N								
1,2,3,4,7,8-HxCDD	SUB016		ng/l	N								

Client: Shetland Islands Council
Project Name: Shetland Islands Council-Shetland Islands Council-Energy
Project No: 23122166
Date Issued: 06/02/2024



Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	004	005
					Customer ID	Filter Press	Effluent
					Sample Type	SOLID	WATER
					Sampling Date	06/12/2023	06/12/2023
PCB-169	SUB016		ng/kg	N		31.72407	
PCB-189	SUB016		ng/kg	N		34.63820	
PCB-77	SUB016		ng/kg	N		32.5801	
PCB-81	SUB016		ng/kg	N		15.88192	
PCBs - TEQ (WHO) Birds - Lower	SUB016		ng/kg	N		9.14684	
PCBs - TEQ (WHO) Birds - Upper	SUB016		ng/kg	N		9.14684	
PCBs - TEQ (WHO) Fish - Lower	SUB016		ng/kg	N		0.30797	
PCBs - TEQ (WHO) Fish - Upper	SUB016		ng/kg	N		0.30797	
PCBs - TEQ (WHO) Mammals - Lower	SUB016		ng/kg	N		6.85498	
PCBs - TEQ (WHO) Mammals - Upper	SUB016		ng/kg	N		6.85498	
PCBs - TEQ SUM - Lower	SUB016		ng/kg	N		6.85498	
PCBs - TEQ SUM - Upper	SUB016		ng/kg	N		6.85498	
Total 2,3,7,8-Dioxins	SUB016		ng/kg	N		4334.33219	
Total 2,3,7,8-Furans	SUB016		ng/kg	N		2193.64363	
Total PCBs	SUB016		ng/kg	N		262.79537	
1,2,3,4,6,7,8-HpCDD	SUB016		ng/l	N			0
1,2,3,4,6,7,8-HpCDF	SUB016		ng/l	N			0
1,2,3,4,7,8,9-HpCDF	SUB016		ng/l	N			0
1,2,3,4,7,8-HxCDD	SUB016		ng/l	N			0



Client: Shetland Islands Council
Project Name: Shetland Islands Council-Shetland Islands Council-Energy
Project No: 23122166
Date Issued: 06/02/2024



Analysis Results

					Sample ID	001		002		003		004
					Customer ID	Bottom Ash		ESP		Bag Filter		Filter Press
					Sample Type	LPL	SOLID	LPL	SOLID	LPL	SOLID	LPL
					Sampling Date	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023
Analysis	Method Code	MDL	Units	Accred.								
1,2,3,4,7,8-HxCDF	SUB016		ng/l	N								
1,2,3,6,7,8-HxCDD	SUB016		ng/l	N								
1,2,3,6,7,8-HxCDF	SUB016		ng/l	N								
1,2,3,7,8,9-HxCDD	SUB016		ng/l	N								
1,2,3,7,8,9-HxCDF	SUB016		ng/l	N								
1,2,3,7,8-PCDD	SUB016		ng/l	N								
1,2,3,7,8-PCDF	SUB016		ng/l	N								
2,3,4,6,7,8-HxCDF	SUB016		ng/l	N								
2,3,4,7,8-PCDF	SUB016		ng/l	N								
2,3,7,8-TCDD	SUB016		ng/l	N								
2,3,7,8-TCDF	SUB016		ng/l	N								
D&Fs - TEQ SUM - Lower	SUB016		ng/l	N								
D&Fs - TEQ SUM - Upper	SUB016		ng/l	N								
OCDD	SUB016		ng/l	N								
OCDF	SUB016		ng/l	N								
PCB-105	SUB016	0.1	µg/l	N								
PCB-114	SUB016	0.1	µg/l	N								
PCB-118	SUB016	0.1	µg/l	N								
PCB-123	SUB016	0.1	µg/l	N								

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 Project Name: Shetland Islands Council-Shetland Islands Council-Energy
 Project No: 23122166
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Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	004	005
					Customer ID	Filter Press	Effluent
					Sample Type	SOLID	WATER
					Sampling Date	06/12/2023	06/12/2023
1,2,3,4,7,8-HxCDF	SUB016		ng/l	N			0
1,2,3,6,7,8-HxCDD	SUB016		ng/l	N			0
1,2,3,6,7,8-HxCDF	SUB016		ng/l	N			0
1,2,3,7,8,9-HxCDD	SUB016		ng/l	N			0
1,2,3,7,8,9-HxCDF	SUB016		ng/l	N			0
1,2,3,7,8-PCDD	SUB016		ng/l	N			0
1,2,3,7,8-PCDF	SUB016		ng/l	N			0
2,3,4,6,7,8-HxCDF	SUB016		ng/l	N			0
2,3,4,7,8-PCDF	SUB016		ng/l	N			0
2,3,7,8-TCDD	SUB016		ng/l	N			0
2,3,7,8-TCDF	SUB016		ng/l	N			0
D&Fs - TEQ SUM - Lower	SUB016		ng/l	N			0.00000
D&Fs - TEQ SUM - Upper	SUB016		ng/l	N			0.01466
OCDD	SUB016		ng/l	N			0
OCDF	SUB016		ng/l	N			0
PCB-105	SUB016	0.1	µg/l	N			<0.1
PCB-114	SUB016	0.1	µg/l	N			<0.1
PCB-118	SUB016	0.1	µg/l	N			<0.1
PCB-123	SUB016	0.1	µg/l	N			<0.1



Client: Shetland Islands Council
Project Name: Shetland Islands Council-Shetland Islands Council-Energy
Project No: 23122166
Date Issued: 06/02/2024



Analysis Results

Analysis	Method Code	MDL	Units	Accred.	Sample ID	001		002		003		004
					Customer ID	Bottom Ash		ESP		Bag Filter		Filter Press
					Sample Type	LPL	SOLID	LPL	SOLID	LPL	SOLID	LPL
					Sampling Date	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023	06/12/2023
PCB-126	SUB016	0.1	µg/l	N								
PCB-156	SUB016	0.1	µg/l	N								
PCB-157	SUB016	0.1	µg/l	N								
PCB-167	SUB016	0.1	µg/l	N								
PCB-169	SUB016	0.1	µg/l	N								
PCB-189	SUB016	0.1	µg/l	N								
PCB-77	SUB016	0.1	µg/l	N								
PCB-81	SUB016	0.1	µg/l	N								
Total 2,3,7,8-Dioxins	SUB016		ng/l	N								
Total 2,3,7,8-Furans	SUB016		ng/l	N								
Total PCBs	SUB016	1.2	µg/l	N								
Free Lime Content	SUB051	0.1	%	N					2.89		7.90	

Client: Shetland Islands Council
 Project Name: Shetland Islands Council-Shetland Islands Council-Energy
 Project No: 23122166
 Date Issued: 06/02/2024



Analysis Results

					Sample ID	004	005
					Customer ID	Filter Press	Effluent
					Sample Type	SOLID	WATER
					Sampling Date	06/12/2023	06/12/2023
Analysis	Method Code	MDL	Units	Accred.			
PCB-126	SUB016	0.1	µg/l	N			<0.1
PCB-156	SUB016	0.1	µg/l	N			<0.1
PCB-157	SUB016	0.1	µg/l	N			<0.1
PCB-167	SUB016	0.1	µg/l	N			<0.1
PCB-169	SUB016	0.1	µg/l	N			<0.1
PCB-189	SUB016	0.1	µg/l	N			<0.1
PCB-77	SUB016	0.1	µg/l	N			<0.1
PCB-81	SUB016	0.1	µg/l	N			<0.1
Total 2,3,7,8-Dioxins	SUB016		ng/l	N			0.00000
Total 2,3,7,8-Furans	SUB016		ng/l	N			0.00000
Total PCBs	SUB016	1.2	µg/l	N			<1.2
Free Lime Content	SUB051	0.1	%	N			

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	Shetland Islands Council	
Site	Shetland Islands Council-Energy	
Project	23122166	
Sample No	Sample Description	Issue Date
23122166-001	Bottom Ash	06/02/2024

Leaching Data	
Weight of Sample (kg)	0.094
Moisture content @ 105°C (% Wet Weight)	4.6
Equivalent weight based on drying @ 105°C (kg)	0.090
Volume of Water required for 10:1 stage (litres)	0.896
Fraction of sample above 4mm %	0
Fraction of non-crushable material %	0

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
		Total Organic Carbon (% M/M)		3	5	6
	LOI450	Loss on Ignition (%)				10
	BTEXHSA	Sum of BTEX (mg/kg)		6		
	PCBUSECD	Sum of 7 Congener PCBs (mg/kg)		1		
	TPHFIDUS	>C10-C40 Aliphatic (mg/kg) EH_1D_AL		500		
	PAHMSUS	Sum of 17 PAHs (mg/kg)		100		
	PHSOIL	pH (pH Units)			>6	
	ANC	Acid Neutralisation Capacity (mol/kg)			To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate	Cumulative Amount Leached at 10:1	Landfill Waste Acceptance Criteria Limit Values		
			mg/l except **	mg/kg (dry wt)	Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM3**	pH (pH Units)	>12.0				
N	WSLM2**	Conductivity (µS/cm)	10300				
U	ICPMSW	Arsenic	<0.001	<0.01	0.5	2	25
U	ICPWATVAR	Barium	0.25	2.5	20	100	300
U	ICPMSW	Cadmium	<0.00002	<0.0002	0.04	1	5
U	ICPMSW	Chromium	0.044	0.44	0.5	10	70
U	ICPMSW	Copper	0.452	4.52	2	50	100
U	ICPMSW	Mercury	0.00003	0.0003	0.01	0.2	2
U	ICPMSW	Molybdenum	0.142	1.42	0.5	10	30
U	ICPMSW	Nickel	<0.001	<0.01	0.4	10	40
U	ICPMSW	Lead	1.67	16.7	0.5	10	50
U	ICPMSW	Antimony	<0.001	<0.01	0.06	0.7	5
U	ICPMSW	Selenium	0.003	0.03	0.1	0.5	7
U	ICPMSW	Zinc	1.52	15.2	4	50	200
U	KONENS	Chloride	487	4870	800	15000	25000
U	ISEF	Fluoride	0.6	6	10	150	500
U	ICPWATVAR	Sulphate as SO4	1060	10600	1000	20000	50000
N	WSLM27	Total Dissolved Solids	7020	70200	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.5	1		
U	WSLM13	Dissolved Organic Carbon	6.27	62.7	500	800	1000

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited.

Calculated data is not UKAS accredited

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	Shetland Islands Council	
Site	Shetland Islands Council-Energy	
Project	23122166	
Sample No	Sample Description	Issue Date
23122166-002	ESP	06/02/2024

Leaching Data	
Weight of Sample (kg)	0.090
Moisture content @ 105°C (% Wet Weight)	0.3
Equivalent weight based on drying @ 105°C (kg)	0.090
Volume of Water required for 10:1 stage (litres)	0.900
Fraction of sample above 4mm %	0
Fraction of non-crushable material %	0

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
		Total Organic Carbon (% M/M)		3	5	6
	LOI450	Loss on Ignition (%)				10
	BTEXHSA	Sum of BTEX (mg/kg)		6		
	PCBUSECD	Sum of 7 Congener PCBs (mg/kg)		1		
	TPHFIDUS	>C10-C40 Aliphatic (mg/kg) EH_1D_AL		500		
	PAHMSUS	Sum of 17 PAHs (mg/kg)		100		
	PHSOIL	pH (pH Units)			>6	
	ANC	Acid Neutralisation Capacity (mol/kg)			To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate	Cumulative Amount Leached at 10:1	Landfill Waste Acceptance Criteria Limit Values		
			mg/l except **	mg/kg (dry wt)	Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM3**	pH (pH Units)	>12.0				
N	WSLM2**	Conductivity (µS/cm)	39700				
U	ICPMSW	Arsenic	0.037	0.37	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.1	20	100	300
U	ICPMSW	Cadmium	0.0532	0.532	0.04	1	5
U	ICPMSW	Chromium	0.002	0.02	0.5	10	70
U	ICPMSW	Copper	0.262	2.62	2	50	100
U	ICPMSW	Mercury	0.00008	0.0008	0.01	0.2	2
U	ICPMSW	Molybdenum	0.608	6.08	0.5	10	30
U	ICPMSW	Nickel	<0.001	<0.01	0.4	10	40
U	ICPMSW	Lead	17.0	170	0.5	10	50
U	ICPMSW	Antimony	<0.001	<0.01	0.06	0.7	5
U	ICPMSW	Selenium	0.024	0.24	0.1	0.5	7
U	ICPMSW	Zinc	2.37	23.7	4	50	200
U	KONENS	Chloride	13000	130000	800	15000	25000
U	ISEF	Fluoride	4.5	45	10	150	500
U	ICPWATVAR	Sulphate as SO4	7770	77700	1000	20000	50000
N	WSLM27	Total Dissolved Solids	27000	270000	4000	60000	100000
U	SFAPI	Phenol Index	0.31	3.1	1		
U	WSLM13	Dissolved Organic Carbon	0.65	6.5	500	800	1000

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited.

Calculated data is not UKAS accredited

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	Shetland Islands Council	
Site	Shetland Islands Council-Energy	
Project	23122166	
Sample No	Sample Description	Issue Date
23122166-003	Bag Filter	06/02/2024

Leaching Data	
Weight of Sample (kg)	0.092
Moisture content @ 105°C (% Wet Weight)	2.0
Equivalent weight based on drying @ 105°C (kg)	0.090
Volume of Water required for 10:1 stage (litres)	0.898
Fraction of sample above 4mm %	0
Fraction of non-crushable material %	0

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
		Total Organic Carbon (% M/M)		3	5	6
	LOI450	Loss on Ignition (%)				10
	BTEXHSA	Sum of BTEX (mg/kg)		6		
	PCBUSECD	Sum of 7 Congener PCBs (mg/kg)		1		
	TPHFIDUS	>C10-C40 Aliphatic (mg/kg) EH_1D_AL		500		
	PAHMSUS	Sum of 17 PAHs (mg/kg)		100		
	PHSOIL	pH (pH Units)			>6	
	ANC	Acid Neutralisation Capacity (mol/kg)			To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate	Cumulative Amount Leached at 10:1	Landfill Waste Acceptance Criteria Limit Values		
			mg/l except **	mg/kg (dry wt)	Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM3**	pH (pH Units)	>12.0				
N	WSLM2**	Conductivity (µS/cm)	11700				
U	ICPMSW	Arsenic	<0.001	<0.01	0.5	2	25
U	ICPWATVAR	Barium	0.40	4.0	20	100	300
U	ICPMSW	Cadmium	<0.00002	<0.0002	0.04	1	5
U	ICPMSW	Chromium	0.024	0.24	0.5	10	70
U	ICPMSW	Copper	0.001	<0.01	2	50	100
U	ICPMSW	Mercury	0.00010	0.0010	0.01	0.2	2
U	ICPMSW	Molybdenum	0.014	0.14	0.5	10	30
U	ICPMSW	Nickel	<0.001	<0.01	0.4	10	40
U	ICPMSW	Lead	0.079	0.79	0.5	10	50
U	ICPMSW	Antimony	<0.001	<0.01	0.06	0.7	5
U	ICPMSW	Selenium	0.019	0.19	0.1	0.5	7
U	ICPMSW	Zinc	0.243	2.43	4	50	200
U	KONENS	Chloride	430	4300	800	15000	25000
U	ISEF	Fluoride	0.3	3	10	150	500
U	ICPWATVAR	Sulphate as SO4	1980	19800	1000	20000	50000
N	WSLM27	Total Dissolved Solids	7960	79600	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.5	1		
U	WSLM13	Dissolved Organic Carbon	24.6	246	500	800	1000

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited.

Calculated data is not UKAS accredited

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	Shetland Islands Council	
Site	Shetland Islands Council-Energy	
Project	23122166	
Sample No	Sample Description	Issue Date
23122166-004	Filter Press	06/02/2024

Leaching Data	
Weight of Sample (kg)	0.127
Moisture content @ 105°C (% Wet Weight)	28.9
Equivalent weight based on drying @ 105°C (kg)	0.090
Volume of Water required for 10:1 stage (litres)	0.863
Fraction of sample above 4mm %	0
Fraction of non-crushable material %	0

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
		Total Organic Carbon (% M/M)		3	5	6
	LOI450	Loss on Ignition (%)				10
	BTEXHSA	Sum of BTEX (mg/kg)		6		
	PCBUSECD	Sum of 7 Congener PCBs (mg/kg)		1		
	TPHFIDUS	>C10-C40 Aliphatic (mg/kg) EH_1D_AL		500		
	PAHMSUS	Sum of 17 PAHs (mg/kg)		100		
	PHSOIL	pH (pH Units)			>6	
	ANC	Acid Neutralisation Capacity (mol/kg)			To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate	Cumulative Amount Leached at 10:1	Landfill Waste Acceptance Criteria Limit Values		
			mg/l except **	mg/kg (dry wt)	Inert Waste Landfill	Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM3**	pH (pH Units)	9.6				
N	WSLM2**	Conductivity (µS/cm)	3050				
U	ICPMSW	Arsenic	<0.001	<0.01	0.5	2	25
U	ICPWATVAR	Barium	0.02	0.2	20	100	300
U	ICPMSW	Cadmium	<0.00002	<0.0002	0.04	1	5
U	ICPMSW	Chromium	0.001	<0.01	0.5	10	70
U	ICPMSW	Copper	<0.001	<0.01	2	50	100
U	ICPMSW	Mercury	0.00011	0.0011	0.01	0.2	2
U	ICPMSW	Molybdenum	0.011	0.11	0.5	10	30
U	ICPMSW	Nickel	<0.001	<0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.024	0.24	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.004	0.04	4	50	200
U	KONENS	Chloride	378	3730	800	15000	25000
U	ISEF	Fluoride	4.2	42	10	150	500
U	ICPWATVAR	Sulphate as SO4	1560	15400	1000	20000	50000
N	WSLM27	Total Dissolved Solids	2070	20400	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.5	1		
U	WSLM13	Dissolved Organic Carbon	1.01	10.0	500	800	1000

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited.

Calculated data is not UKAS accredited

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Socotec
ESG
ESG House, Bretby Business Park
Bretby
Burton upon Trent
United Kingdom
DE15 0YZ



4225



Attention : Chem Subcon
Date : 6th February, 2024
Your reference : 23122166
Our reference : Test Report 23/21961 Batch 1
Location : Shetland Islands Council Energy
Date samples received : 27th December, 2023
Status : Final Report
Issue : 202402060919

Five samples were received for analysis on 27th December, 2023 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 2.896 kg of CO2

Scope 1&2&3 emissions - 6.844 kg of CO2

Authorised By:

redacted

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Socotec
Reference: 23122166
Location: Shetland Islands Council Energy
Contact: Chem Subcon

Sample Date: 6 Dec 2023
Date of Receipt: 27 Dec 2023
Date Analysed: 3 Feb 2024

Sample ID: 23122166-001
Depth:
EMT Job No: 23/21961
EMT Sample No: 1
Matrix: Solid (Ash)
Method: TM206/PM139 Dioxins, Furans and PCBs in solid samples by HR-GCMS

ANALYSIS OF PCDDs and PCDFs

Q : Qualifiers

SV Indicates surrogate recovery outside performance criteria
>> Indicates value exceeds calibration range

Key

LOD Limit of Detection
ISO 17025 (UKAS)
M MCERTS accredited

CAS No		Compound	Q	Result ng/kg	LOD	I-TEFs	TEQ Lower Bound	TEQ Upper Bound	% Recovery
1746-01-6	#	2378-TCDD		<0.29538	0.29538	1	0.00000	0.29538	102
40321-76-4	#	12378-PCDD		<0.47625	0.47625	1	0.00000	0.47625	94
39227-28-6	#	123478-HxCDD		<0.6126	0.6126	0.1	0.00000	0.06126	80
57653-85-7	#	123678-HxCDD		<0.63574	0.63574	0.1	0.00000	0.06357	77
19408-74-3	#	123789-HxCDD		<0.61457	0.61457	0.1	0.00000	0.06146	
35822-46-9	#	1234678-HpCDD		6.11400	0.25219	0.01	0.06114	0.06114	74
3268-87-9	#	OCDD		17.93447	0.34001	0.0003	0.00538	0.00538	92
Total 2,3,7,8-Dioxins				24.04847					
51207-31-9	#	2378-TCDF		0.80246	0.67526	0.1	0.08025	0.08025	68
57117-41-6	#	12378-PCDF		1.76814	0.80148	0.03	0.05304	0.05304	82
57117-31-4	#	23478-PCDF		1.88170	0.95845	0.3	0.56451	0.56451	74
70648-26-9	#	123478-HxCDF		<0.55952	0.55952	0.1	0.00000	0.05595	88
57117-44-9	#	123678-HxCDF		<0.55569	0.55569	0.1	0.00000	0.05557	79
60851-34-5	#	234678-HxCDF		3.11166	0.84494	0.1	0.31117	0.31117	64
72918-21-9	#	123789-HxCDF		1.25078	0.83545	0.1	0.12508	0.12508	71
67562-39-4	#	1234678-HpCDF		11.04663	0.25291	0.01	0.11047	0.11047	79
55673-89-7	#	1234789-HpCDF		1.95381	0.34741	0.01	0.01954	0.01954	74
39001-02-0	#	OCDF		18.56947	0.34354	0.0003	0.00557	0.00557	83
Total 2,3,7,8-Furans				40.38465					
TEQ (WHO) Mammals							1.33615	2.40559	
TEQ (WHO) Birds							3.43702	4.41862	
TEQ (WHO) Fish							1.64540	2.84736	
TEQ (NATO)							1.77340	2.60472	

Upper-Bound: 'Upper-bound' means the concept which requires using the limit of quantification for the contribution of each non-quantified congener

Lower-Bound: 'Lower-bound' means the concept which requires using zero for the contribution of each non-quantified congener

TEQ: Toxic Equivalent Value

TEF: Toxic Equivalent Factor

Element Materials Technology

Client Name: Socotec
Reference: 23122166
Location: Shetland Islands Council Energy
Contact: Chem Subcon

Sample Date: 6 Dec 2023
Date of Receipt: 27 Dec 2023
Date Analysed: 1 Feb 2024

Sample ID: 23122166-001
Depth:
EMT Job No: 23/21961
EMT Sample No: 1
Matrix: Solid (Ash)
Method: TM206/PM139 Dioxins, Furans and PCBs in solid samples by HR-GCMS

ANALYSIS OF PCBs

Q : Qualifiers

SV Indicates surrogate recovery outside performance criteria
>> Indicates value exceeds calibration range

Key

LOD Limit of Detection
ISO 17025 (UKAS)
M MCERTS accredited

CAS No		Compound	Q	Result ng/kg	LOD	I-TEFs	TEQ Lower Bound	TEQ Upper Bound	% Recovery
70362-50-4	#	PCB-81		0.34614	0.15874	0.0003	0.00010	0.00010	78
32598-13-3	#	PCB-77		1.58322	0.37388	0.0001	0.00016	0.00016	69
65510-44-3	#	PCB-123		<0.41021	0.41021	0.00003	0.00000	0.00001	81
31508-00-6	#	PCB-118	+	4.00914	0.40121	0.00003	0.00012	0.00012	79
74472-37-0	#	PCB-114		<0.42415	0.42415	0.00003	0.00000	0.00001	80
32598-14-4	#	PCB-105		1.67678	0.43407	0.00003	0.00005	0.00005	76
57465-28-8	#	PCB-126		<0.73967	0.73967	0.1	0.00000	0.07397	82
52663-72-6	#	PCB-167		0.85117	0.20938	0.00003	0.00003	0.00003	83
38380-08-4	#	PCB-156		2.01486	0.18973	0.00003	0.00006	0.00006	90
69782-90-7	#	PCB-157		0.33132	0.19784	0.00003	0.00001	0.00001	86
32774-16-6	#	PCB-169		<0.03975	0.03975	0.03	0.00000	0.00119	77
39635-31-9	#	PCB-189		0.47510	0.07320	0.00003	0.00001	0.00001	78
		Total PCBs		11.28773					
		TEQ (WHO) Mammals					0.00054	0.07572	
		TEQ (WHO) Birds					0.11378	0.18782	
		TEQ (WHO) Fish					0.00038	0.00408	

Upper-Bound: 'Upper-bound' means the concept which requires using the limit of quantification for the contribution of each non-quantified congener

Lower-Bound: 'Lower-bound' means the concept which requires using zero for the contribution of each non-quantified congener

TEQ: Toxic Equivalent Value

TEF: Toxic Equivalent Factor

Element Materials Technology

Client Name: Socotec
Reference: 23122166
Location: Shetland Islands Council Energy
Contact: Chem Subcon

Sample Date: 6 Dec 2023
Date of Receipt: 27 Dec 2023
Date Analysed: 3 Feb 2024

Sample ID: 23122166-002
Depth:
EMT Job No: 23/21961
EMT Sample No: 2
Matrix: Solid (Ash)
Method: TM206/PM139 Dioxins, Furans and PCBs in solid samples by HR-GCMS

ANALYSIS OF PCDDs and PCDFs

Q : Qualifiers

SV Indicates surrogate recovery outside performance criteria
>> Indicates value exceeds calibration range

Key

LOD Limit of Detection
ISO 17025 (UKAS)
M MCERTS accredited

CAS No		Compound	Q	Result ng/kg	LOD	I-TEFs	TEQ Lower Bound	TEQ Upper Bound	% Recovery
1746-01-6	#	2378-TCDD		0.83873	0.56546	1	0.83873	0.83873	105
40321-76-4	#	12378-PCDD		8.46666	1.07733	1	8.46666	8.46666	96
39227-28-6	#	123478-HxCDD		7.09875	1.68522	0.1	0.70987	0.70987	85
57653-85-7	#	123678-HxCDD		19.81982	1.79155	0.1	1.98198	1.98198	81
19408-74-3	#	123789-HxCDD		12.25938	1.73188	0.1	1.22594	1.22594	
35822-46-9	#	1234678-HpCDD		247.59156	0.81435	0.01	2.47592	2.47592	78
3268-87-9	#	OCDD		850.16389	0.99061	0.0003	0.25505	0.25505	101
Total 2,3,7,8-Dioxins				1146.23879					
51207-31-9	#	2378-TCDF		1.57451	0.81264	0.1	0.15745	0.15745	82
57117-41-6	#	12378-PCDF		6.43601	1.82616	0.03	0.19308	0.19308	90
57117-31-4	#	23478-PCDF		9.38575	1.78299	0.3	2.81573	2.81573	92
70648-26-9	#	123478-HxCDF		16.49297	1.68711	0.1	1.64930	1.64930	88
57117-44-9	#	123678-HxCDF		19.36493	1.61917	0.1	1.93649	1.93649	85
60851-34-5	#	234678-HxCDF		31.82258	1.82808	0.1	3.18226	3.18226	77
72918-21-9	#	123789-HxCDF		12.64803	2.56156	0.1	1.26480	1.26480	71
67562-39-4	#	1234678-HpCDF		138.9385	0.6468	0.01	1.38939	1.38939	79
55673-89-7	#	1234789-HpCDF		33.31366	0.83997	0.01	0.33314	0.33314	79
39001-02-0	#	OCDF		287.324	0.911	0.0003	0.08620	0.08620	91
Total 2,3,7,8-Furans				557.30094					
TEQ (WHO) Mammals							28.96199	28.96199	
TEQ (WHO) Birds							32.80506	32.80506	
TEQ (WHO) Fish							28.38566	28.38566	
TEQ (NATO)							27.53078	27.53078	

Upper-Bound: 'Upper-bound' means the concept which requires using the limit of quantification for the contribution of each non-quantified congener

Lower-Bound: 'Lower-bound' means the concept which requires using zero for the contribution of each non-quantified congener

TEQ: Toxic Equivalent Value

TEF: Toxic Equivalent Factor

Element Materials Technology

Client Name: Socotec

Reference: 23122166

Location: Shetland Islands Council Energy

Contact: Chem Subcon

Sample Date: 6 Dec 2023

Date of Receipt: 27 Dec 2023

Date Analysed: 1 Feb 2024

Sample ID: 23122166-002

Depth:

EMT Job No: 23/21961

EMT Sample No: 2

Matrix: Solid (Ash)

Method: TM206/PM139 Dioxins, Furans and PCBs in solid samples by HR-GCMS

ANALYSIS OF PCBs

Q : Qualifiers		Key	
SV	Indicates surrogate recovery outside performance criteria	LOD	Limit of Detection
>>	Indicates value exceeds calibration range	#	ISO 17025 (UKAS)
		M	MCERTS accredited

CAS No	#	Compound	Q	Result	LOD	I-TEFs	TEQ Lower Bound	TEQ Upper Bound	% Recovery
				ng/kg					
70362-50-4	#	PCB-81	+	3.95134	0.23582	0.0003	0.00119	0.00119	86
32598-13-3	#	PCB-77		8.75037	0.34708	0.0001	0.00088	0.00088	82
65510-44-3	#	PCB-123		0.55151	0.53998	0.00003	0.00002	0.00002	85
31508-00-6	#	PCB-118		7.10453	0.51086	0.00003	0.00021	0.00021	84
74472-37-0	#	PCB-114		1.38218	0.52312	0.00003	0.00004	0.00004	85
32598-14-4	#	PCB-105		4.08033	0.52045	0.00003	0.00012	0.00012	83
57465-28-8	#	PCB-126		11.34854	0.79206	0.1	1.13485	1.13485	89
52663-72-6	#	PCB-167		2.92745	0.32681	0.00003	0.00009	0.00009	90
38380-08-4	#	PCB-156		7.08553	0.31142	0.00003	0.00021	0.00021	94
69782-90-7	#	PCB-157		3.12072	0.33353	0.00003	0.00009	0.00009	91
32774-16-6	#	PCB-169		6.97167	0.70036	0.03	0.20915	0.20915	88
39635-31-9	#	PCB-189		6.91686	0.19739	0.00003	0.00021	0.00021	85
		Total PCBs		64.19103					
		TEQ (WHO) Mammals					1.34706	1.34706	
		TEQ (WHO) Birds					1.98020	1.98020	
		TEQ (WHO) Fish					0.06014	0.06014	

Upper-Bound: 'Upper-bound' means the concept which requires using the limit of quantification for the contribution of each non-quantified congener
Lower-Bound: 'Lower-bound' means the concept which requires using zero for the contribution of each non-quantified congener
TEQ: Toxic Equivalent Value
TEF: Toxic Equivalent Factor

Element Materials Technology

Client Name: Socotec
Reference: 23122166
Location: Shetland Islands Council Energy
Contact: Chem Subcon

Sample Date: 6 Dec 2023
Date of Receipt: 27 Dec 2023
Date Analysed: 3 Feb 2024

Sample ID: 23122166-003
Depth:
EMT Job No: 23/21961
EMT Sample No: 3
Matrix: Solid (Ash)
Method: TM206/PM139 Dioxins, Furans and PCBs in solid samples by HR-GCMS

ANALYSIS OF PCDDs and PCDFs

Q : Qualifiers

SV Indicates surrogate recovery outside performance criteria
>> Indicates value exceeds calibration range

Key

LOD Limit of Detection
ISO 17025 (UKAS)
M MCERTS accredited

CAS No		Compound	Q	Result ng/kg	LOD	I-TEFs	TEQ Lower Bound	TEQ Upper Bound	% Recovery
1746-01-6	#	2378-TCDD		67.95631	8.73494	1	67.95631	67.95631	94
40321-76-4	#	12378-PCDD		1208.82203	15.20395	1	1208.82203	1208.82203	50
39227-28-6	#	123478-HxCDD	SV	883.71438	17.38953	0.1	88.37144	88.37144	28
57653-85-7	#	123678-HxCDD		2031.24126	20.68528	0.1	203.12413	203.12413	28
19408-74-3	#	123789-HxCDD		616.54719	19.99623	0.1	61.65472	61.65472	
35822-46-9	#	1234678-HpCDD	SV	11516.91455	26.72887	0.01	115.16915	115.16915	11
3268-87-9	#	OCDD	SV	12347.78081	48.70919	0.0003	3.70433	3.70433	5
		Total 2,3,7,8-Dioxins		28672.97653					
51207-31-9	#	2378-TCDF		722.54969	11.71641	0.1	72.25497	72.25497	63
57117-41-6	#	12378-PCDF	SV	1061.72600	17.57923	0.03	31.85178	31.85178	38
57117-31-4	#	23478-PCDF		1937.09422	14.16569	0.3	581.12826	581.12826	57
70648-26-9	#	123478-HxCDF		1793.70996	16.56949	0.1	179.37100	179.37100	30
57117-44-9	#	123678-HxCDF		2037.5641	16.9769	0.1	203.75641	203.75641	27
60851-34-5	#	234678-HxCDF	SV	2540.09004	21.33679	0.1	254.00900	254.00900	24
72918-21-9	#	123789-HxCDF	SV	1114.86200	33.74334	0.1	111.48620	111.48620	15
67562-39-4	#	1234678-HpCDF	SV	5639.97614	10.96104	0.01	56.39976	56.39976	12
55673-89-7	#	1234789-HpCDF	SV	1193.94592	16.97034	0.01	11.93946	11.93946	10
39001-02-0	#	OCDF	SV	3731.74206	23.73875	0.0003	1.11952	1.11952	5
		Total 2,3,7,8-Furans		21773.26013					
		TEQ (WHO) Mammals					3252.11847	3252.11847	
		TEQ (WHO) Birds					4998.83439	4998.83439	
		TEQ (WHO) Fish					3632.96101	3632.96101	
		TEQ (NATO)					3067.61647	3067.61647	

Upper-Bound: 'Upper-bound' means the concept which requires using the limit of quantification for the contribution of each non-quantified congener

Lower-Bound: 'Lower-bound' means the concept which requires using zero for the contribution of each non-quantified congener

TEQ: Toxic Equivalent Value

TEF: Toxic Equivalent Factor

Element Materials Technology

Client Name: Socotec
Reference: 23122166
Location: Shetland Islands Council Energy
Contact: Chem Subcon

Sample Date: 6 Dec 2023
Date of Receipt: 27 Dec 2023
Date Analysed: 1 Feb 2024

Sample ID: 23122166-003
Depth:
EMT Job No: 23/21961
EMT Sample No: 3
Matrix: Solid (Ash)
Method: TM206/PM139 Dioxins, Furans and PCBs in solid samples by HR-GCMS

ANALYSIS OF PCBs

Q : Qualifiers

SV Indicates surrogate recovery outside performance criteria
>> Indicates value exceeds calibration range

Key

LOD Limit of Detection
ISO 17025 (UKAS)
M MCERTS accredited

CAS No		Compound	Q	Result ng/kg	LOD	I-TEFs	TEQ Lower Bound	TEQ Upper Bound	% Recovery
70362-50-4	#	PCB-81	SV	5310.44431	45.15867	0.0003	1.59313	1.59313	5
32598-13-3	#	PCB-77		8523.03537	7.27313	0.0001	0.85230	0.85230	35
65510-44-3	#	PCB-123		794.95128	6.65758	0.00003	0.02385	0.02385	84
31508-00-6	#	PCB-118	+	2486.34280	6.04157	0.00003	0.07459	0.07459	88
74472-37-0	#	PCB-114		1356.75936	6.48736	0.00003	0.04070	0.04070	85
32598-14-4	#	PCB-105		4889.54404	6.38340	0.00003	0.14669	0.14669	86
57465-28-8	#	PCB-126		10565.39732	23.12464	0.1	1056.53973	1056.53973	38
52663-72-6	#	PCB-167		2018.87215	6.69387	0.00003	0.06057	0.06057	85
38380-08-4	#	PCB-156		4383.65367	6.18114	0.00003	0.13151	0.13151	91
69782-90-7	#	PCB-157		3212.69781	6.51371	0.00003	0.09638	0.09638	89
32774-16-6	#	PCB-169		4444.94348	16.14003	0.03	133.34830	133.34830	52
39635-31-9	#	PCB-189		4677.40204	5.63591	0.00003	0.14032	0.14032	85
		Total PCBs		52664.04363					
		TEQ (WHO) Mammals					1193.04807	1193.04807	
		TEQ (WHO) Birds					2019.66205	2019.66205	
		TEQ (WHO) Fish					56.67587	56.67587	

Upper-Bound: 'Upper-bound' means the concept which requires using the limit of quantification for the contribution of each non-quantified congener

Lower-Bound: 'Lower-bound' means the concept which requires using zero for the contribution of each non-quantified congener

TEQ: Toxic Equivalent Value

TEF: Toxic Equivalent Factor

Element Materials Technology

Client Name: Socotec
Reference: 23122166
Location: Shetland Islands Council Energy
Contact: Chem Subcon

Sample Date: 6 Dec 2023
Date of Receipt: 27 Dec 2023
Date Analysed: 3 Feb 2024

Sample ID: 23122166-004
Depth:
EMT Job No: 23/21961
EMT Sample No: 4
Matrix: Solid (Ash)
Method: TM206/PM139 Dioxins, Furans and PCBs in solid samples by HR-GCMS

ANALYSIS OF PCDDs and PCDFs

Q : Qualifiers

SV Indicates surrogate recovery outside performance criteria
>> Indicates value exceeds calibration range

Key

LOD Limit of Detection
ISO 17025 (UKAS)
M MCERTS accredited

CAS No		Compound	Q	Result ng/kg	LOD	I-TEFs	TEQ Lower Bound	TEQ Upper Bound	% Recovery
1746-01-6	#	2378-TCDD		2.04898	1.90305	1	2.04898	2.04898	101
40321-76-4	#	12378-PCDD		47.78502	4.72707	1	47.78502	47.78502	88
39227-28-6	#	123478-HxCDD		53.78536	5.61738	0.1	5.37854	5.37854	76
57653-85-7	#	123678-HxCDD		123.61033	5.69257	0.1	12.36103	12.36103	74
19408-74-3	#	123789-HxCDD		80.19375	5.50294	0.1	8.01938	8.01938	
35822-46-9	#	1234678-HpCDD		1365.1241	3.0747	0.01	13.65124	13.65124	84
3268-87-9	#	OCDD		2661.78465	2.60403	0.0003	0.79854	0.79854	101
Total 2,3,7,8-Dioxins				4334.33219					
51207-31-9	#	2378-TCDF		13.08894	2.90939	0.1	1.30889	1.30889	87
57117-41-6	#	12378-PCDF		30.23799	4.48469	0.03	0.90714	0.90714	97
57117-31-4	#	23478-PCDF		70.71436	5.74525	0.3	21.21431	21.21431	88
70648-26-9	#	123478-HxCDF		103.40555	4.25958	0.1	10.34056	10.34056	87
57117-44-9	#	123678-HxCDF		109.39951	4.29996	0.1	10.93995	10.93995	83
60851-34-5	#	234678-HxCDF		180.99892	4.72526	0.1	18.09989	18.09989	76
72918-21-9	#	123789-HxCDF		67.49835	6.14762	0.1	6.74983	6.74983	74
67562-39-4	#	1234678-HpCDF		579.58934	1.88272	0.01	5.79589	5.79589	84
55673-89-7	#	1234789-HpCDF		150.66406	2.46068	0.01	1.50664	1.50664	82
39001-02-0	#	OCDF		888.04661	1.88442	0.0003	0.26641	0.26641	93
Total 2,3,7,8-Furans				2193.64363					
TEQ (WHO) Mammals							167.17224	167.17224	
TEQ (WHO) Birds							203.75868	203.75868	
TEQ (WHO) Fish							171.44113	171.44113	
TEQ (NATO)							160.51224	160.51224	

Upper-Bound: 'Upper-bound' means the concept which requires using the limit of quantification for the contribution of each non-quantified congener

Lower-Bound: 'Lower-bound' means the concept which requires using zero for the contribution of each non-quantified congener

TEQ: Toxic Equivalent Value

TEF: Toxic Equivalent Factor

Element Materials Technology

Client Name: Socotec
Reference: 23122166
Location: Shetland Islands Council Energy
Contact: Chem Subcon

Sample Date: 6 Dec 2023
Date of Receipt: 27 Dec 2023
Date Analysed: 1 Feb 2024

Sample ID: 23122166-004
Depth:
EMT Job No: 23/21961
EMT Sample No: 4
Matrix: Solid (Ash)
Method: TM206/PM139 Dioxins, Furans and PCBs in solid samples by HR-GCMS

ANALYSIS OF PCBs

Q : Qualifiers

SV Indicates surrogate recovery outside performance criteria
>> Indicates value exceeds calibration range

Key

LOD Limit of Detection
ISO 17025 (UKAS)
M MCERTS accredited

CAS No		Compound	Q	Result ng/kg	LOD	I-TEFs	TEQ Lower Bound	TEQ Upper Bound	% Recovery
70362-50-4	#	PCB-81		15.88192	0.89586	0.0003	0.00476	0.00476	73
32598-13-3	#	PCB-77		32.5801	0.8815	0.0001	0.00326	0.00326	76
65510-44-3	#	PCB-123		2.47471	0.89866	0.00003	0.00007	0.00007	75
31508-00-6	#	PCB-118	+	13.42290	0.83456	0.00003	0.00040	0.00040	75
74472-37-0	#	PCB-114		4.68355	0.87133	0.00003	0.00014	0.00014	75
32598-14-4	#	PCB-105		17.70325	0.87457	0.00003	0.00053	0.00053	73
57465-28-8	#	PCB-126		58.91547	2.49316	0.1	5.89155	5.89155	85
52663-72-6	#	PCB-167		9.79877	0.75270	0.00003	0.00029	0.00029	76
38380-08-4	#	PCB-156		24.49000	0.69268	0.00003	0.00073	0.00073	82
69782-90-7	#	PCB-157		16.48243	0.72761	0.00003	0.00049	0.00049	80
32774-16-6	#	PCB-169		31.72407	2.79594	0.03	0.95172	0.95172	77
39635-31-9	#	PCB-189		34.63820	0.54392	0.00003	0.00104	0.00104	78
		Total PCBs		262.79537					
		TEQ (WHO) Mammals					6.85498	6.85498	
		TEQ (WHO) Birds					9.14684	9.14684	
		TEQ (WHO) Fish					0.30797	0.30797	

Upper-Bound: 'Upper-bound' means the concept which requires using the limit of quantification for the contribution of each non-quantified congener

Lower-Bound: 'Lower-bound' means the concept which requires using zero for the contribution of each non-quantified congener

TEQ: Toxic Equivalent Value

TEF: Toxic Equivalent Factor

ANALYSIS OF PCDDs and PCDFs

Client Name: Socotec
Reference: 23122166
Location: Shetland Islands Council Energy
Contact: Chem Subcon
Receipt Date: 6 Dec 2023
Analysis Date: 29/01/2024
Report Date: 31/01/2024

Sample ID: 23122166-005
EMT Job No: 23/21961
EMT Sample No: 5
Matrix: Liquid
Method: Dioxins and Furans by HR-GCMS
Instrument: DFS - High Resolution Magnetic Sector MS

Q* - Qualifiers

n.d. less than Limit of detection

Key

LOD Limit of Detection Limit
ISO 17025 (UKAS)
M MCERTS accredited

Results: Expressed ng/Kg dry sample

Compound	Q*	Result	LOD	I-TEFs	TEQ Lower Bound	TEQ Upper Bound	Percent Recovery %
2,3,7,8-TCDD #		n.d.	0.00405	1	0.00000	0.00405	70
1,2,3,7,8-PeCDD #		n.d.	0.00463	1	0.00000	0.00463	56
1,2,3,4,7,8-HxCDD #		n.d.	0.00777	0.1	0.00000	0.00078	63
1,2,3,6,7,8-HxCDD #		n.d.	0.00835	0.1	0.00000	0.00084	60
1,2,3,7,8,9-HxCDD #		n.d.	0.00807	0.1	0.00000	0.00081	
1,2,3,4,6,7,8-HpCDD #		n.d.	0.00302	0.01	0.00000	0.00003	58
OCDD #		n.d.	0.0037	0.0003	0.00000	0.00000	80
Total 2,3,7,8-Dioxins		0.00000					
2,3,7,8-TCDF #		n.d.	0.00435	0.1	0.00000	0.00044	57
1,2,3,7,8-PCDF #		n.d.	0.00593	0.03	0.00000	0.00018	53
2,3,4,7,8-PeCDF #		n.d.	0.0057	0.3	0.00000	0.00171	58
1,2,3,4,7,8-HxCDF #		n.d.	0.00284	0.1	0.00000	0.00028	56
1,2,3,6,7,8-HxCDF #		n.d.	0.00253	0.1	0.00000	0.00025	60
2,3,4,6,7,8-HxCDF #		n.d.	0.00275	0.1	0.00000	0.00028	55
1,2,3,7,8,9-HxCDF #		n.d.	0.00329	0.1	0.00000	0.00033	56
1,2,3,4,6,7,8-HpCDF #		n.d.	0.00292	0.01	0.00000	0.00003	59
1,2,3,4,7,8,9-HpCDF #		n.d.	0.00375	0.01	0.00000	0.00004	59
OCDF #		n.d.	0.00176	0.0003	0.00000	0.00000	66
Total 2,3,7,8-Furans		0.00000					
SUM - TEQ					0.00000	0.01466	
TEQ (NATO)					0.00000	0.01361	
TEQ (WHO) - Mammals					0.00000	0.01466	
TEQ (WHO)-Birds					0.00000	0.02181	
TEQ (WHO)-Fish					0.00000	0.01730	
Upper-Bound: 'Upper-bound' means the concept which requires using the limit of quantification for the contribution of each non-quantified congener Lower-Bound: 'Lower-bound' means the concept which requires using zero for the contribution of each non-quantified congener TEQ: Toxic Equivalent Value TEF: Toxic Equivalent Factor							
Comment:							

[illegible]

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/21961

SOILS and ASH

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

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

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

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

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

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

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

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

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

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

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

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

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

WATERS

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

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

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

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

STACK EMISSIONS

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

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).

Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

ABBREVIATIONS and ACRONYMS USED

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

EMT Job No: 23/21961

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM206	Analysis of Dioxins, Furans and PCBs in solid samples by HR-GCMS.	PM139	Extraction and clean-up of Dioxins (PCDDs), Furans (PCDFs) and dioxin like PCBs from solid samples using accelerator solvent extractor and clean up system.			AD	Yes
TM206	Analysis of Dioxins, Furans and PCBs in solid samples by HR-GCMS.	PM139	Extraction and clean-up of Dioxins (PCDDs), Furans (PCDFs) and dioxin like PCBs from solid samples using accelerator solvent extractor and clean up system.	Yes		AD	Yes

KIRTON CONCRETE SERVICES LTD

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www.kirtonlab.co.uk

An independent testing laboratory specialising in the testing of cementitious materials

TEST REPORT PREPARED FOR SOCOTEC			
REPORT REFERENCE	SOC	269	
Client REFERENCE	23122166-002	2024	
JOB NUMBER	23122166		
Purchase Order Number	B174455BEC		
DATE OF RECEIPT OF SAMPLE	21-Dec-23		
DATE OF TESTS	8-Jan-24	to	8-Jan-24
DATE OF REPORT	8-Jan-24		

ALL RESULTS ARE BASED ON SAMPLE RECEIVED FROM THE CLIENT: TESTED AS RECEIVED.	
PFA RESULTS TO EN 450: 2012	
FREE CALCIUM OXIDE	2.89 %

END OF REPORT

KIRTON CONCRETE SERVICES LTD

redacted

SIGNED:.....

Certificate signed by: redacted

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An independent testing laboratory specialising in the testing of cementitious materials

TEST REPORT PREPARED FOR SOCOTEC			
REPORT REFERENCE	SOC	270	
Client REFERENCE	23122166-003	2024	
JOB NUMBER	23122166		
Purchase Order Number	B174455BEC		
DATE OF RECEIPT OF SAMPLE	21-Dec-23		
DATE OF TESTS	8-Jan-24	to	8-Jan-24
DATE OF REPORT	8-Jan-24		

ALL RESULTS ARE BASED ON SAMPLE RECEIVED FROM THE CLIENT: TESTED AS RECEIVED.

PFA RESULTS TO EN 450: 2012

FREE CALCIUM OXIDE	7.90 %
--------------------	--------

END OF REPORT

KIRTON CONCRETE SERVICES LTD

redacted

SIGNED:.....

Certificate signed by

redacted



Client: Shetland Islands Council
Project Name: Shetland Islands Council-Shetland Islands Council-Energy
Project No: 23122166
Date Issued: 06/02/2024

[Deviating Sample Report](#)

			Incorrect Container	Incorrect Label	Headspace	Incorrect/No Preservative	No Sampling Date	Holding Time
<u>Sample Reference</u>	<u>Text ID</u>	<u>Method Code</u>						
Effluent	23122166-005	PAHMSW						✓



Client: Shetland Islands Council
Project Name: Shetland Islands Council-Shetland Islands Council-Energy
Project No: 23122166
Date Issued: 06/02/2024

Analysis Method

<u>Method Code</u>	<u>Method Description</u>	<u>Analysis Method</u>
CLANDPREP	CLand Prep Dry Weight Content @ 35°C	As Received
CLANDPREP	Solid Material Description	As Received
ICPMSS	Antimony in IBA by ICPMS	Air Dried & Ground
ICPMSS	Thallium in IBA by ICPMS	Air Dried & Ground
ICPMSW (Dissolved)	Antimony (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Antimony in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Arsenic (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Arsenic in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Cadmium (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Cadmium in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Chromium (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Chromium in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Copper (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Copper in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Lead (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Lead in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Mercury (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Mercury in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Molybdenum (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Molybdenum in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Nickel (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Nickel in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Selenium (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Selenium in Solids (BSEN 12457-2)	Filtered
ICPMSW (Dissolved)	Zinc (Diss.) in Lab Leachate by ICPMS	Filtered
ICPMSW (Dissolved)	Zinc in Solids (BSEN 12457-2)	Filtered
ICPSOIL	Antimony in IBA by ICPOES	Air Dried & Ground
ICPSOIL	Arsenic in IBA by ICPOES	Air Dried & Ground
ICPSOIL	Cadmium in IBA by ICPOES	Air Dried & Ground
ICPSOIL	Chromium in IBA by ICPOES	Air Dried & Ground
ICPSOIL	Cobalt in IBA by ICPOES	Air Dried & Ground
ICPSOIL	Copper in IBA by ICPOES	Air Dried & Ground
ICPSOIL	Lead in IBA by ICPOES	Air Dried & Ground
ICPSOIL	Manganese in IBA by ICPOES	Air Dried & Ground
ICPSOIL	Mercury in IBA by ICPOES	Air Dried & Ground
ICPSOIL	Nickel in IBA by ICPOES	Air Dried & Ground
ICPWATVAR (Dissolved)	Barium (Diss.) in Lab Leachate by ICPOES	Filtered
ICPWATVAR (Dissolved)	Barium in Solids (BSEN 12457-2)	Filtered
ICPWATVAR (Dissolved)	Total Sulphur as SO ₄ (Diss.) in Lab Leachate	Filtered
ICPWATVAR (Dissolved)	Total Sulphur as SO ₄ in Solids (BSEN 12457-2)	Filtered
ISEF	Fluoride by ISE	Filtered
ISEF	Fluoride in Solids (BSEN 12457-2)	Filtered
KONENS	Chloride by Colorimetry	Filtered
KONENS	Chloride in Solids (BSEN 12457-2)	Filtered
Leachate Prep CEN 10:1	WAC Leachate Prep, 1-Stage 10:1 (BSEN 12457-2)	As Received
LOI(%MM)	LOI: Loss on Ignition @ 450°C	Air Dried & Ground
PAHMSUS	16 PAHs by GCMS	As Received
PAHMSW	16 PAHs by GCMS	Unfiltered
PHCONDW	Electrical Conductivity @ 25°C	Filtered
PHCONDW	pH	Filtered



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PHCONDW	TDS: Total Dissolved Solids (Calc)	Filtered
PHCONDW	Total Dissolved Solids in Solids (BSEN 12457-2)	Filtered
SFAPI	Phenol Index (Total) by SFA	Filtered
SFAPI	Phenol Index in Solids (BSEN 12457-2)	Filtered
SUB016	Dioxins, Furans & PCBs in Water	
SUB016	Dioxins, Furans & PCBs inc. TEQs in Solids	
SUB051	Free Lime Content (Calcium Oxide) in Ash	
TMSS	Total Moisture @ 105°C	As Received
TOCW	LOC: Leached Organic Carbon	Filtered
WAC	WAC Report	
WSLM13	Leached Organic Carbon in Solids (BSEN 12457-2)	Filtered
WSLM59	TOC: Total Organic Carbon	Air Dried & Ground

Project Report Notes

As part of method development the upper calibration limit for the PHCONDW method has been reduced from pH 13 to pH 12. A result of 12.726 pH units was obtained for this sample. This is outside the new working range of the method and should therefore be used for guidance purposes only. Any accreditation has been removed where applicable.

Result Report Notes

Letters alongside results signify that the result has associated report notes.
 The report notes are as follows:

<u>Letter</u>	<u>Note</u>
A	Due to the matrix of the sample the laboratory has had to deviate from our standard protocols to be able to process the sample and provide a result. Where applicable the accreditation has been removed and this should be taken into consideration when utilising the data.
B	The QC associated with this result has not wholly met the QMS requirements, the accreditation has therefore been removed. However, the Laboratory has confidence in the performance of the method as a whole and that the integrity of the data has not been significantly compromised.
C	Due to matrix interference, the internal standard and/or surrogate has not met the QMS requirements. This should be taken into consideration when utilising the data.
D	A non-standard volume or mass has been used for this test which has resulted in a raised detection limit.
E	Due to the parameter value being beyond our calibration range (and following the maximum size of dilution allowed, where applicable), the result cannot be quantified and as such the result will appear as a greater than symbol (>) with the accreditation removed. This data should be used for indicative purposes only.
F	Based on the sample history, appearance and smell a dilution was applied prior to testing. Unfortunately, the result is either above (>) or below (<) our calibration range. Results above our calibration range have accreditation removed. The data should be used for indicative purposes only.
G	The day 5 oxygen reading was below the capability of the instrument to detect, and therefore the calculated BOD has been reported unaccredited for guidance purposes only.



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HWOL Acronym Key

<u>Acronym</u>	<u>Description</u>
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e everything extracted by the solvent(s)
CU	Clean up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
+	Operator to indicate cumulative e.g. EH_CU+HS_1D_Total

Additional Information

This report refers to samples as received. SOCOTEC UK Ltd takes no responsibility for accuracy or competence of sampling by others.

Results within this report relate only to the samples tested.

The accreditation codes are as follows:

- U = UKAS accredited analysis
- M = MCERT accredited analysis
- N = Unaccredited analysis

Any units marked with ^ signify results are reported on a dry weight basis of 105° c.

All Air Dried and Ground Samples (ADG) are oven dried at less than 35° c.

This report shall not be reproduced except in full, without written approval of the laboratory.

Opinions and interpretations given are outside the scope of our UKAS accreditation.

Any samples marked with * are not covered by our scope of UKAS accreditation. If applicable, further report notes have been added.

Any solid samples where the Major Constituents are not one of the following (Sand, Silt, Clay, Made Ground) are not one of our accredited matrix types.

Any samples marked with ‡ have had MCERTS accreditation removed for this result

Any samples marked with a tick in the deviant table is deviant for the specific reason.

Any samples reported as IS, NA, ND mean the following:

- IS = Insufficient Sample to complete analysis
- NA = Sample is not amenable for the required analysis
- ND = Results cannot be determined

Items listed with a 'SUB' method code prefix have been carried out by an external subcontracted laboratory.

Our deviating sample report does not include deviancy information for Subcontracted analysis. Please see the report from the subcontracted lab for information regarding any deviancies for this analysis.

Summaries of analysis methods are available upon request.

End of Certificate of Analysis