

APPENDIX C

CHEMICAL TEST REQUIREMENTS

SCHEDULE 1.19.6 (Derived from BRE Special Digest SD1)

CHEMICAL TESTS ON POTENTIALLY AGGRESSIVE GROUND/GROUNDWATER

SUITE A: Greenfield Site (pyrite absent)			
Sample Type	Determinand	Recommended Test Method	Test Method Specified/Offered ¹
Soil	pH in 2.5:1 water/soil extract	BR 279 Elecrometric	
		BS 1377 Part 3, Method 9	
	SO ₄ in 2:1 Water/soil extract	BR 279 Gravimetric method, cation exchange or iron chromatography	
		BS 1377 Part 3, Method 5.3+5.5	
		TRL 447 Test 1	
Groundwater	pH	BR 279 Elecrometric	
		BS 1377 Part 3, Method 9	
	SO ₄	BR 279 Gravimetric method, cation exchange or iron chromatography	
		BS 1377 Part 3, Method 5.4+5.5	
		Commercial lab in-house procedure: determination of sulphur by ICP-AES ²	

1. Contractor to detail method(s) offered.
2. ICP-AES: Inductively Coupled Plasma Atomic Emission Spectroscopy

SCHEDULE 1.19.6 (Derived from BRE Special Digest SD1)

CHEMICAL TESTS ON POTENTIALLY AGGRESSIVE GROUND/GROUNDWATER

SUITE D: Brownfield Site (pyrite present)			
Sample Type	Determinand	Recommended Test Method	Test Method Specified/Offered ¹
Soil	pH in 2.5:1 water/soil extract	BR 279 Elecrometric	
		BS 1377 Part 3, Method 9	
	SO ₄ in 2:1 water/soil extract	BR 279 Gravimetric method, cation exchange or iron chromatography	
		BS 1377 Part 3, Method 5.3+5.5	
		TRL 447 Test 1	
	Acid Soluble SO ₄	BR 279 Gravimetric method	
		BS 1377 Part 3, Method 5.2+5.5	
		TRL 447 Test 2	
	Total Sulphur	BR 279 Ignition in Oxygen	
		TRL 447 Test 4A	
TRL 447 Test 4B			
Mg (only required if water soluble SO ₄ >3000mg/l)	BR 279 AAS ² method		
	Commercial lab in-house procedure: variant of BR279 using ICP-AES ³		
NO ₃ in 2:1 water/soil extract (only required if pH>5.5)	BR 279		
Cl in 2:1 water/soil extract (only required if pH>5.5)	BR 279		
	BS 1377 Part 3, Method 7.2		
Groundwater	pH	BR 279 Elecrometric	
		BS 1377 Part 3, Method 9	
	SO ₄	BR 279 Gravimetric method, cation exchange or iron chromatography	
		BS 1377 Part 3, Method 5.4+5.5	
		Commercial lab in-house procedure: determination of sulphur by ICP-AES ³	
	Mg (only required if water soluble SO ₄ ≥3000mg/l)	BR 279 AAS ² method	
		Commercial lab in-house procedure: Mg in solution using ICP-AES	
NO ₃ (only required if pH>5.5)	BR 279		
Cl (only required if pH>5.5)	BR 279		
	BS 1377 Part 3, Method 7.2		

1. Either Project Manager to specify or Contractor to detail method(s) offered.

2. AAS: Atomic Absorption Spectrometry

3. ICP-AES: Inductively Coupled Plasma Atomic Emission Spectroscopy

SCHEDULE 1.20.3

CHEMICAL LABORATORY TESTING FOR CONTAMINATION

Nominated test laboratory? _____

Required testing turn-around times? 10 days maximum

The following provides the minimum lower Limits of Detection required for each of the determinands listed in test suite tables E to G.

SUITE E: Soil Samples			
Determinand	Required Lower Limit of Detection	Test Method (if specific method required)	Accreditation
Arsenic	1		
Antimony	1		
Barium	1		
Boron	1		
Cadmium	0.5		
Chromium VI	1		
Chromium III	1		
Copper	1		
Lead	1		
Mercury	0.5		
Nickel	1		
Zinc	1		
Selenium	1		
Vanadium	1		
pH	0.01 pH units		
Water Soluble Sulphate	0.01 g/l		
Total Organic Carbon	0.1 %		
USEPA Speciated 16 Polycyclic Aromatic Hydrocarbons (PAHs)	0.1 mg/kg for each compound		
Petroleum Hydrocarbons – speciated TPHCWG	0.5 mg/kg C5-C12 10 mg/kg C12-35		

SCHEDULE 1.20.3

CHEMICAL LABORATORY TESTING FOR CONTAMINATION

Nominated test laboratory? _____

Required testing turn-around times? 10 days maximum

SUITE F: Water Samples			
Determinand	Required Lower Limit of Detection	Test Method (if specific method required)	Accreditation
Arsenic	1 µg/l		
Antimony	1 µg/l		
Barium	1 µg/l		
Boron	10 µg/l		
Cadmium	0.05 µg/l		
Chromium III	1 µg/l		
Chromium VI	1 µg/l		
Copper	1 µg/l		
Lead	0.5 µg/l		
Mercury	0.05 µg/l		
Nickel	1 µg/l		
Zinc	1 µg/l		
Selenium	1 µg/l		
Vanadium	1 µg/l		
pH	0.01 pH units		
Total Organic Carbon	1 mg/l		
USEPA Speciated 16 PAHs	0.01 µg/l for each compound		
Petroleum Hydrocarbons – speciated TPHCWG	10 µg/l for each fraction		
Ammoniacal Nitrogen (as N)	0.02 mg/l		
Electrical Conductivity	1 µS/cm		
Hardness	1 mg/l		
Major ions (Ca, Mg, Na, K, Cl, SO ₄ , Alkalinity)	0.5 mg/l 5 mg/l Alkalinity		