

## Technical Guidance Note

### Current Method Statements – Analytical Services

**The following list is not exhaustive but covers the main types of analysis undertaken by the laboratory.**

**AME0003 – Alpha Spectrometry analysis** is performed using silicon surface barrier detectors to an in-house method.

**AME0044 – Gamma spectrometry analysis** is carried out using low-level HPGE detectors to an in-house method.

Uncertainties quoted at 95% confidence level on counting statistics only.

Uranium-238 activity is inferred from its daughter product Thorium-234.

Thorium-228 is inferred from Pb-212 assuming natural equilibrium has been reached.

**AME0064 – Hydrocarbon analysis (Oil on sand)** is performed using the BEIS approved FTIR method (revision 3.0). Calibration has been performed using site/installation specific oils, where available. Less than (<) values are reported when the measured result is below the limit of quantification. This is typically 300 mg/kg.

**AME0065 – Anion analysis** is performed using EPA 300.1 via Ion Chromatography. Calibration is performed using certified anion standards which are traceable to NIST standard.

ND - Not Detected is reported when the measured result is below background.

**AME0070 – Loss on ignition** is performed using an in-house method. Values are reported in % w/w.

**AME0071 – Loss on solvent washing** is performed using an in-house method. Values are reported in % w/w.

**AME0073 – Particle Size analysis** is performed using an in-house method. Values are reported in % w/w.

**AME0077 – Hydrocarbon analysis (Total Petroleum Hydrocarbon)** is performed to an in-house method based on EPA 413.2 and 418.1 approved FTIR methods and complies with BEIS regulations. Calibration has been performed using appropriate reference oils. Less than (<) values are reported when the measured result is below the limit of quantification. This is typically 300 mg/kg.

**AME0078 – Heavy Metals Extractable by Reverse Aqua Regia Digest** is performed using an in-house method based on EPA methods 3051A for Microwave Digestion and 6020A Metals by ICP-MS. Linear Calibration over the range of interest is performed using certified environmental standards which are produced in accordance with the ISO 17034 standard. Performance of the method is verified by analysis of Certified Reference Materials alongside samples, produced in accordance with the ISO 17034 standard. Less than (<) values are reported when the factored

result is below the limit of quantification for the specified element, determined by method validation. Values marked with an asterisk '\*' fall outside of our ISO 17025 accreditation scope.

**AME0081-Determination of dry residue or water content** was conducted by Loss on Drying in a heating oven at 105°C as detailed in BS EN 15934:2012 Method A. Results are reported as a '% (w/w)' to 2 decimal places. Performance of the method is verified by analysis of Certified Reference Materials alongside samples, produced in accordance with the ISO 17034 standard. LOQ for the method is 1% Dry Matter or 1% Water Content.

**AME0081-Determination of dry residue or water content** was conducted by Volumetric Karl-Fischer Titration as detailed in BS EN 15934:2012 Method B. Results are reported as a '% (w/w)' to 2 decimal places. Performance of the method is verified by analysis of Certified Reference Materials alongside samples, produced in accordance with the ISO 17034 standard. LOQ for the method is 1% Dry Matter or 1% Water Content.

**AME0083 – Hydrocarbon analysis (Triband Total Petroleum Hydrocarbon)** is performed based on British standard method BS EN 14039:2004 via GC-FID. Calibration has been performed using certified matrix oils which are traceable to NIST standard.

**AME0084 – Qualitative determination of carbonate** is performed using an in-house method. Values are reported as positive/negative.

**AME0085 – Magnetic properties of solid samples** is performed using an in-house method. Values are reported as positive/negative.

**AME0086 – Qualitative determination of sulfides** is performed using an in-house method. Values are reported as positive/negative.

**AME0087 – Acid insolubles** is performed using an in-house method. Values are reported in % w/w.

**AME0089 – Density/ Specific Gravity Analysis** is performed using an in-house method. Density results are reported in g/ml, specific gravity is unitless.

**AME0091 – Determination of Flash point (Flash test, Flammability)** is performed using the British Standard Method BS EN ISO 3679:2015. The instrument is externally calibrated, and verification is performed with a Certified Reference Material produced under the ISO 17034 standard. Test interval is 1°C. The limit of quantification is ambient temperature +5°C, typically 25 °C. Atmospheric pressure is corrected for and the result stated is at 101.3 kPa.

**AME0094 – Solids in Suspension** is performed using an in-house method. Values are reported in mg/L.

**AME0098 - Analysis of Volatile Organic Compounds (VOC's) in solid and liquid samples using HS-GC-MS** is performed using an in-house method based on standard EPA methods 8260B, 8260C and 5021 and ISO 22155:2011(E). Calibration has been performed using certified reference standards. Less than values are reported when the measured result is below the limit of quantification for the specific analyte. This is typically below 0.1 mg/kg for solids and 0.1 mg/L for liquids.

**AME0099 - Polycyclic aromatic hydrocarbon analysis by GC-MS** is performed using an in-house method based on standard EPA methods 8270D, 3550C and 8310. Calibration has been performed using certified reference standards. Less than values are reported when the measured

result is below the limit of quantification for the specific analyte. This is typically below 0.1 mg/kg for solids and 0.1 mg/L for liquids.

**AME0106: Waste Acceptance Criteria Testing** has been performed to BS EN 12457- 4:2002, sample matrix compliance with this method is at the sole discretion of the customer. Any deviations from the standard method are noted and referenced to the relevant clause of the standard. Waste Acceptance Criteria Limits provided are for guidance only. Tracerco does not take responsibility for any omissions. Data correct as of March 2013 as per EA guidance document EBPRI 11507B.