


# Schedule of Accreditation

issued by

## United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

 <p><b>4038</b></p> <p>Accredited to <b>ISO/IEC 17025:2017</b></p>	<h3>National Nuclear Laboratory</h3> <p><b>Issue No: 019    Issue date: 06 August 2024</b></p>	
	<p><b>A709, Measurement &amp; Analysis Laboratory</b> Springfields Salwick Preston Lancashire PR4 0XJ</p>	<p><b>Contact: Miss Laura McVittie</b> Tel: +44 (0)1772 963902 Fax: +44 (0)1772 762117 E-Mail: laura.mcvittie@uknnl.com Website: www.nnl.co.uk</p>
<p><b>Testing performed at the above address only</b></p>		

### DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
<p><b>CLEARANCE/DECOMMISSIONING/WASTE SAMPLES</b></p> <p>Intermediate and low level waste samples (resins, swabs/filters, graphite, sludges and concretes, aqueous samples/pond waters)</p> <p>Intermediate and low level waste samples (resins, filters, metals, oils, sludges and concretes, aqueous samples)</p> <p>Dissolution liquor and aqueous samples</p>	<p><u>Radiochemical Testing</u></p> <p>Tritium (<sup>3</sup>H) (Total) and Carbon-14</p> <p>Sample dissolution and preparation</p> <p>Screening for:</p> <p>Total alpha activity (relative to <sup>241</sup>Am)</p> <p>Total beta activity - low energy X-ray and beta emitting nuclides (&lt;20keV) (relative to <sup>55</sup>Fe and <sup>3</sup>H)</p> <p>Total beta activity - high energy beta emitting nuclides (relative to <sup>90</sup>Sr, <sup>137</sup>Cs and <sup>60</sup>Co)</p>	<p>Documented in house methods:</p> <p>WRC SOP 0150 for sample/source preparation by combustion furnace WRC SOP 0511, 0512, 0115, 0513 for liquid scintillation counting</p> <p>WRC SOP 0459 for dissolution and preparation of resins, filters, metals, oils, sludges and concretes into dissolution liquors and aqueous solutions for subsequent radiochemical determinations, by way of acid leaching and digestion, ashing, fusion</p> <p>WRC SOP 0403 for sample/source preparation WRC SOP 0511, 0512, 0115, 0513 for liquid scintillation counting</p>



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CLEARANCE/DECOMMISSIONING/ WASTE SAMPLES (cont'd)  Dissolution liquor and aqueous samples	<u>Radiochemical Testing (cont'd)</u>  Quantitative analysis:  Gamma emitting radio-nuclides (energy range: 59 keV - 1836 keV)  Plutonium isotopes: <sup>239+240</sup> Pu, <sup>238</sup> Pu Americium isotopes: <sup>241</sup> Am Curium isotopes: <sup>243/244</sup> Cm, <sup>242</sup> Cm  Uranium isotopes: <sup>238</sup> U, <sup>236/235</sup> U, <sup>234</sup> U  Plutonium isotopes: <sup>241</sup> Pu  Strontium isotopes: <sup>90</sup> Sr  Nickel isotopes: <sup>63</sup> Ni  Promethium isotopes: <sup>147</sup> Pm,  Tritium ( <sup>3</sup> H)	Documented in house methods:  WRC SOP 0401 for operation of the gamma spectrometers WRC SOP 0408 for calibration of the gamma spectrometers  WRC SOP 0409 for sample/source preparation WRC SOP 0313 for alpha spectrometry  WRC SOP 0414 for sample/source preparation WRC SOP 0313 for alpha spectrometry  WRC SOP 0415 for sample/source preparation WRC SOP 0511, 0512, 0115, 0513 for liquid scintillation counting  WRC SOP 0305 for sample/source preparation WRC SOP 0511, 0512, 0115, 0513 for liquid scintillation counting  WRC SOP 0406 for sample/source preparation WRC SOP 0511, 0512, 0115, 0513 for liquid scintillation counting WRC SOP 1002 for ICP-OES  WRC SOP 407 for sample/source preparation WRC SOP 0511, 0512, 0115, 0513 for liquid scintillation counting WRC SOP 1002 for ICP-OES  WRC SOP 0207 (aqueous only) WRC SOP 0511, 0512, 0115, 0513 for liquid scintillation counting



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<p>CLEARANCE/DECOMMISSIONING/ WASTE SAMPLES (cont'd)</p> <p>Aqueous samples (acidic solutions, waste waters, uranic solutions)</p>	<p><u>Chemical Testing</u></p> <p>Elemental determination for:</p> <ul style="list-style-type: none"> <li>Aluminium - Al</li> <li>Antimony - Sb</li> <li>Arsenic - As</li> <li>Barium - Ba</li> <li>Boron - B</li> <li>Beryllium - Be</li> <li>Cadmium - Cd</li> <li>Chromium - Cr</li> <li>Cobalt - Co</li> <li>Copper - Cu</li> <li>Caesium - Cs</li> <li>Dysprosium - Dy</li> <li>Europium - Eu</li> <li>Iron - Fe</li> <li>Gadolinium - Gd</li> <li>Lead - Pb</li> <li>Lithium - Li</li> <li>Magnesium - Mg</li> <li>Manganese - Mn</li> <li>Mercury - Hg</li> <li>Molybdenum - Mo</li> <li>Neodymium - Nd</li> <li>Nickel - Ni</li> <li>Potassium - K</li> <li>Rubidium - Rb</li> <li>Samarium - Sm</li> <li>Silicon - Si</li> <li>Silver - Ag</li> <li>Sodium - Na</li> <li>Strontium - Sr</li> <li>Technetium - Tc</li> <li>Thallium - Tl</li> <li>Thorium - Th</li> <li>Tin - Sn</li> <li>Titanium - Ti</li> <li>Vanadium - V</li> <li>Zinc - Zn</li> <li>Zirconium - Zr</li> </ul> <p>Uranium - U (Total), <sup>235</sup>U and <sup>238</sup>U Uranium isotopic abundance (<sup>235</sup>U/<sup>238</sup>U ratio)</p>	<p>Documented in house method:</p> <p>WRC SOP 1003 by ICP-MS</p>



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<p>CLEARANCE/DECOMMISSIONING/ WASTE SAMPLES (cont'd)</p> <p>Acidic Samples and Dissolution liquors (including fused samples) Range: µg/L to g/100 ml</p>	<p><u>Chemical Testing</u> (cont'd)</p> <p>Elemental determination for:</p> <ul style="list-style-type: none"> <li>Aluminium - Al</li> <li>Antimony - Sb</li> <li>Arsenic - As</li> <li>Barium - Ba</li> <li>Boron - B</li> <li>Beryllium - Be</li> <li>Cadmium - Cd</li> <li>Calcium - Ca</li> <li>Chromium - Cr</li> <li>Cobalt - Co</li> <li>Copper - Cu</li> <li>Dysprosium - Dy</li> <li>Europium - Eu</li> <li>Iron - Fe</li> <li>Gadolinium - Gd</li> <li>Lead - Pb</li> <li>Lithium - Li</li> <li>Magnesium - Mg</li> <li>Manganese - Mn</li> <li>Molybdenum - Mo</li> <li>Neodymium - Nd</li> <li>Nickel - Ni</li> <li>Potassium - K</li> <li>Rubidium - Rb</li> <li>Samarium - Sm</li> <li>Silicon - Si</li> <li>Silver - Ag</li> <li>Sodium - Na</li> <li>Strontium - Sr</li> <li>Sulphur - S</li> <li>Thallium - Tl</li> <li>Thorium - Th</li> <li>Tin - Sn</li> <li>Titanium - Ti</li> <li>Uranium - U</li> <li>Vanadium - V</li> <li>Zinc - Zn</li> <li>Zirconium - Zr</li> </ul>	<p>Documented in house method:</p> <p>WRC SOP 1002 by ICP-OES</p>

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