

## Purpose

This document lists the specific methods that Bubble Technology Industries (BTI) performs in accordance with ISO/IEC 17025:2005, *General requirements for the competence of testing and calibration laboratories*. Please note that BTI is not accredited by a third party. Compliance is confirmed through an internal audit program that meets the requirements of ISO 9001:2015 and ISO/IEC 17025:2005. **This scope was not issued by an accreditation body.**

All radiochemical analysis methods and survey meter calibration methods, including those not listed below, are performed within a quality management system that is ISO 9001 certified by BSI under certificate number FM 502976.

## Testing Field: Radiochemical Testing

Type of Test	Test Object	Test Parameter	Available Isotopes	Method Reference
Gas flow proportional counting	Cloth swipes, Filter papers, Cotton swabs	Gross Alpha Activity	<sup>241</sup> Am, <sup>252</sup> Cf, <sup>244</sup> Cm, <sup>238</sup> Pu, <sup>239</sup> Pu, <sup>226</sup> Ra	Internally-developed methods described in SOPs BTI-RS-E-3-0004 and BTI-RS-E-3-0005
Gas flow proportional counting	Cloth swipes, Filter papers, Cotton swabs	Gross Beta Activity	DU, <sup>14</sup> C, <sup>147</sup> Pm, <sup>60</sup> Co, <sup>137</sup> Cs, <sup>36</sup> Cl, <sup>90</sup> Sr/ <sup>90</sup> Y, <sup>55</sup> Fe, <sup>192</sup> Ir, <sup>99</sup> Tc	Internally-developed methods described in SOPs BTI-RS-E-3-0004 and BTI-RS-E-3-0005
Gamma spectroscopy	Cloth swipes, Filter papers, Cotton swabs	Gamma Activity	<sup>133</sup> Ba, <sup>109</sup> Cd, <sup>57</sup> Co, <sup>75</sup> Se, <sup>22</sup> Na, <sup>137</sup> Cs	Internally-developed methods described in SOPs BTI-RS-E-3-0003 and BTI-RS-E-3-0036

## Calibration Field: Ionizing Radiation and Radioactivity Measurements

Calibration Object	Quantity	Calibration Isotope	Range (H*(10) Rates)	CMC ( $\pm$ ) <sup>(1)</sup>	Method Reference
Gamma survey meter	Accuracy of dose rate	<sup>137</sup> Cs <sup>(2)</sup>	~0.47 $\mu$ Sv/h to ~4400 $\mu$ Sv/h	11% reading	SOP BTI-RS-C-3-0002
Neutron survey meter	Accuracy of dose rate	<sup>252</sup> Cf <sup>(3)</sup>	~1.6 $\mu$ Sv/h to ~361 $\mu$ Sv/h	13% reading	SOP BTI-RS-C-3-0005

<sup>(1)</sup> The CMC is the calibration and measurement capability of the laboratory. It represents the smallest uncertainty that a customer can expect for a calibration measurement. The estimated uncertainty for a measurement may be higher due to the characteristics of the particular survey meter. CMCs are expanded uncertainties produced using a coverage factor of  $k = 2$ , which defines an interval estimated to have a level of confidence of 95%.

<sup>(2)</sup> This source is traceable to the SI through the National Research Council of Canada (NRC).

<sup>(3)</sup> This source is traceable to the SI through the National Institute of Standards and Technology (NIST).