Contents

CRM: A reference material characterized by a metrologically valid procedure for one or more specified properties, accompanied by a reference material certificate that provides the value of the specified property, its associated uncertainty, and a statement of metrological traceability.

A complete listing of ERA's CRMs can be found on our Scope of Accreditation for general requirements for competence of reference material producers available at www.eraqc.com/AboutERA/Accreditations.

PT: A Proficiency Test (PT) is an analysis of what is often referred to as a blind sample or a sample with unknown concentrations of analytes for the purpose of evaluating a laboratory's analytical performance.

QR: Similar to a Proficiency Test, a QuiK Response (QR) is a sample with unknown concentrations. However, unlike a scheduled PT, QR is on-demand and available at any time. Plus, your results are returned within two business days. QuiK Response can be used as a bilateral PT as referenced in the IUPAC/CITAC guide: Selection and use of PT schemes for a limited number of participants – chemical analytical labs.

RM: A material, sufficiently homogeneous and stable with respect to one or more specified properties, which has been established to be fit for its intended use in a measurement process.

Q All Waters ERA WS Radchem PTs open quarterly. Quarterly months are January, April, July, and October.

✱ All Waters ERA MRAD PTs open in March and September.

WS Radchem

All Radchem standards are provided as convenient, easy-to-prepare concentrates except for tritium, which is provided as a whole-volume sample.

Gamma Emitters

CRM	PT		QR
Cat. #758	Cat. #808	Q	Cat. #758QR

One 12 mL screw-top vial yields up to 2 liters after dilution.

Barium-133	10–100 pCi/L
Cesium-134	10–100 pCi/L
Cesium-137	20–240 pCi/L
Cobalt-60	10–120 pCi/L
Zinc-65	30–360 pCi/L

Gross Alpha/Beta

CRM	PT		QR
Cat. #759	Cat. #809	Q	Cat. #759QR

One 12 mL screw-top vial yields up to 1 liter after dilution.

Gross alpha as thorium-230	7–75 pCi/L
Gross beta as cesium-137	8–75 pCi/L

Naturals

CRM	PT		QR
Cat. #751	Cat. #811	Q	Cat. #751QR

One 12 mL screw-top vial yields up to 8 liters after dilution.

Radium-226	1–20 pCi/L
Radium-228	2–20 pCi/L
Uranium (Nat)	2–70 pCi/L
Uranium (Nat) mass	3–104 µg/L

Tritium

CRM	PT		QR
Cat. #752	Cat. #812	Q	Cat. #752QR

One 250 mL whole-volume bottle is ready to analyze as received. Includes tritium at 1000–24000 pCi/L.

Iodine-131

CRM	PT		QR
Cat. #750	Cat. #810	Q	Cat. #750QR

One 12 mL screw-top vial yields up to 2 liters after dilution. Contains iodine-131 within the range 3–30 pCi/L. Due to short half-life, CRMs, PTs, and QRs are available only during January, April, July, and October.

Strontium-89/90

CRM	PT		QR
Cat. #757	Cat. #807	Q	Cat. #757QR

One 12 mL screw-top vial yields up to 2 liters after dilution.

Strontium-89	10–70 pCi/L
Strontium-90	3–45 pCi/L

Learn more about Radiochemistry products

CRM – Certified Reference Material
PT – Proficiency Testing
QR – QuiK Response

Q All Waters ERA WS Radchem PTs open quarterly. Quarterly months are January, April, July, and October.

Radchem Lab Control & Matrix Spiking (LCS/MS)

Radiochemistry LCS/MS standards are prepared according to your specifications at activity levels that enable you to directly fortify your batch laboratory control and matrix spike QC samples. These single-use spiking standards are verified, conveniently packaged in 2–20 mL glass vials, and very economical.

The direct benefits:

- **Easy-to-use** – LCS/MS spiking standards are ready-to-use – no dilutions are required.
- **Reliable and consistent** – Eliminate the possibility of errors from the contamination or repeated multiple dilutions of your primary stock standards.
- **Independently verified** – LCS/MS standards are analytically verified and traced to NIST SRMs where available.
- **Save money** – You no longer need to pay for microcuries of activity when you only need picocuries. You also eliminate the cost of activity loss for short-lived isotopes.
- **Reduce analytical cost** – You no longer need to spend valuable instrument time re-verifying standard stability. Order what you expect to use on a quarterly or annual basis – we'll do the verification.

The process is easy:

1. Select from any of the following carrier-free, single radionuclide standards.
2. Choose an activity up to the maximum listed in the table below.
3. Choose a convenient volume: 2 to 20 mL glass vials available.
4. For labs that analyze samples with more elevated activities, call for standard availability and pricing.

Single Radionuclide Spiking Standards

Cat. #	Radionuclide	Maximum Activity/Vial
AM241	Americium-241	40 pCi
BA133	Barium-133	400 pCi
CS134	Cesium-134	200 pCi
CS137	Cesium-137	400 pCi
CO60	Cobalt-60	200 pCi
GAB	Gross alpha/beta	30/40 pCi
GA	Gross alpha (Th-230)	30 pCi
GB	Gross beta (Cs-137)	40 pCi
PU238	Plutonium-238	40 pCi
PU239	Plutonium-239	40 pCi
RA226	Radium-226	20 pCi
RA228	Radium-228	Call
SR89	Strontium-89	200 pCi
SR90	Strontium-90	40 pCi
H3	Tritium	2000 pCi
UNAT	Uranium, natural	40 pCi
ZN65	Zinc-65	600 pCi

MRAD Solids

Soil Radionuclides

RM	PT	QR
Cat. #608	Cat. #802	Cat. #608QR

One 500 cc standard includes the alpha, beta, and gamma emitting radionuclides listed below.

Actinium-228	500–5000 pCi/kg
Americium-241	50–2000 pCi/kg
Bismuth-212	500–5000 pCi/kg
Bismuth-214	500–5000 pCi/kg
Cesium-134	1000–10,000 pCi/kg
Cesium-137	1000–10,000 pCi/kg
Cobalt-60	1000–10,000 pCi/kg
Lead-212	500–5000 pCi/kg
Lead-214	500–5000 pCi/kg
Plutonium-238	50–2000 pCi/kg
Plutonium-239	50–2000 pCi/kg
Potassium-40	5000–50,000 pCi/kg
Strontium-90	500–10,000 pCi/kg
Thorium-234	500–5000 pCi/kg
Uranium-234	500–5000 pCi/kg
Uranium-238	500–5000 pCi/kg
Uranium (Nat)	1000–10,000 pCi/kg
Uranium (Nat) mass	1500–15,000 µg/kg
Zinc-65	1000–10,00 pCi/kg

Vegetation Radionuclides

RM	PT	QR
Cat. #609	Cat. #803	Cat. #609QR

One 500 cc standard includes the alpha, beta, and gamma emitting radionuclides listed below.

Americium-241	50–5000 pCi/kg
Cesium-134	300–3000 pCi/kg
Cesium-137	300–3000 pCi/kg
Cobalt-60	300–3000 pCi/kg
Curium-244	50–5000 pCi/kg
Plutonium-238	50–5000 pCi/kg
Plutonium-239	50–5000 pCi/kg
Potassium-40	5000–50,000 pCi/kg
Strontium-90	500–10,000 pCi/kg
Uranium-234	50–5000 pCi/kg
Uranium-238	50–5000 pCi/kg
Uranium (Nat)	100–10,000 pCi/kg
Uranium (Nat) mass	150–15,000 µg/kg
Zinc-65	300–3000 pCi/kg

MRAD Air Filter

Air Filter Radionuclides

RM	PT	QR
Cat. #606	Cat. #800	Cat. #606QR

One 47 mm diameter glass fiber filter contains the alpha, beta, and gamma emitting radionuclides listed below.

Americium-241	2–80 pCi/filter
Cesium-134	50–1500 pCi/filter
Cesium-137	50–1500 pCi/filter
Cobalt-60	50–1500 pCi/filter
Iron-55	50–1500 pCi/filter
Plutonium-238	2–80 pCi/filter
Plutonium-239	2–80 pCi/filter
Strontium-90	5–200 pCi/filter
Uranium-234	2–80 pCi/filter
Uranium-238	2–80 pCi/filter
Uranium (Nat)	4–160 pCi/filter
Uranium (Nat) mass	6–240 µg/filter
Zinc-65	50–1500 pCi/filter

Air Filter Gross Alpha/Beta

RM	PT	QR
Cat. #607	Cat. #801	Cat. #607QR

One acrylic treated 47 mm diameter glass fiber filter contains the radionuclides listed below.

Gross alpha as thorium-230	5–100 pCi/filter
Gross beta as cesium-137	5–100 pCi/filter

MRAD Water

Water Radionuclides

RM	PT	QR
Cat. #617	Cat. #804	Cat. #617QR

One 12 mL screw-top vial yields up to 2 liters after dilution. Includes the alpha, beta, and gamma emitting radionuclides listed below.

Americium-241	10–200 pCi/L
Cesium-134	100–3000 pCi/L
Cesium-137	100–3000 pCi/L
Cobalt-60	100–3000 pCi/L
Iron-55	100–3000 pCi/L
Plutonium-238	10–200 pCi/L
Plutonium-239	10–200 pCi/L
Strontium-90	50–1000 pCi/L
Uranium-234	10–200 pCi/L
Uranium-238	10–200 pCi/L
Uranium (Nat)	20–400 pCi/L
Uranium (Nat) mass	30–600 µg/L
Zinc-65	100–3000 pCi/L

Water Gross Alpha/Beta

RM	PT	QR
Cat. #615	Cat. #805	Cat. #615QR

One 12 mL screw-top vial yields up to 2 liters after dilution. Includes the radionuclides below.

Gross alpha as thorium-230	10–200 pCi/L
Gross beta as cesium-137	10–200 pCi/L

Water Tritium

RM	PT	QR
Cat. #616	Cat. #806	Cat. #616QR

One 125 mL whole-volume bottle is ready to analyze as received.

Tritium	3000–30,000 pCi/L

CRM – Certified Reference Material
PT – Proficiency Testing
QR – QuiK Response

All Waters ERA MRAD PTs open in March and September.