NYSDOH ELAP RADIOCHEMISTRY CHECKLIST

This checklist incorporates references to TNI 2016 Standards.

Directions: Place a mark (e.g., /, √ or X) in the appropriate column (Yes (Y), No (N), or Not Applicable (NA)). If it is an observation on areas for possible improvement, place a mark under the Suggestion (S) column. In database, use code "SGST."

Lab ID: _____ Assessment ID: _____

Lab Name: _____

If the information on the "**Lab Pre-Assessment Report**" is **NOT** accurate, note the changes that need to be made below. In addition, the lab will need to formally request the change using Application Form 107.

Address (Mailing): _____

Address (Physical Location):

_____

Telephone: _____

E-mail: _____

Personnel Interviewed:

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

At the time of the assessment, a question marked 'yes' indicates that no evidence of a deficiency was observed.

Assessment Date(s):_____ Assessor (Signature): _____

If this was a team assessment, indicate the Lead Assessor's name. _____

Radiochemical Analysis Detailed Method Review	Deficiency Code	Comments
Method Number: **SOP Number:** **Rev.:** **SOP date:** **Personnel records observed:** **Data records observed:**		
Method Number: **SOP Number:** **Rev.:** **SOP date:** **Personnel records observed:** **Data records observed:**		
Method Number: **SOP Number:** **Rev.:** **SOP date:** **Personnel records observed:** **Data records observed:**		
Method Number: **SOP Number:** **Rev.:** **SOP date:** **Personnel records observed:** **Data records observed:**		

Radiochemical Analysis Detailed Method Review	Deficiency Code	Comments
Method Number: **SOP Number:** **Rev.:** **SOP date:** **Personnel records observed:** **Data records observed:**		
Method Number: **SOP Number:** **Rev.:** **SOP date:** **Personnel records observed:** **Data records observed:**		
Method Number: **SOP Number:** **Rev.:** **SOP date:** **Personnel records observed:** **Data records observed:**		
Method Number: **SOP Number:** **Rev.:** **SOP date:** **Personnel records observed:** **Data records observed:**		

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
Method Validation – Validation of Methods [M6,1.5.1a]							
The laboratory validates all methods, prior to their acceptance and institution, for the data that will be reported.	M6,1.5.1(a)					**R100**	
The laboratory validates all methods across the range of physical and chemical parameters (e.g., density, Test Source composition, and analytical configurations) and activities that will be encountered in the samples.	M6,1.5.1(a)					**R101**	
Where applicable, the activity range includes zero activity in the validation.	M6,1.5.1(a)					**R102**	
The laboratory validates method(s) in each quality system matrix for which it is applicable (using the procedures specified in V1M61.5.2 - 1.5.5) demonstrating the method's detection capability, precision, bias, Measurement Uncertainty, and selectivity.	M6,1.5.1(b)					**R103**	
For each method for which documented data are not otherwise available, the laboratory performs validation to demonstrate that the above requirements are met. For reference methods, published data, if available, may be used to satisfy these requirements.	M6,1.5.1(c)					**R104**	
The laboratory records the quality system matrix used in the initial method validation studies.	M6,1.5.1(d)					**R105**	
The laboratory retains all supporting documentation for the initial study in a readily retrievable format for the lifetime of the method.	M6,1.5.1(d)					**R106**	
The laboratory's method validations comply with V1M2, 5.4.5.1 - 5.4.5.3.	M6,1.5.1(e)					**R107**	
The laboratory documents the method validation procedures used, and the results obtained.	M6,1.5.1(f)					**R108**	
The documentation includes a statement as to whether the method is suitable for the intended use.	M6,1.5.1(f)					**R109**	
The laboratory analyzes for all methods, whenever available, externally-produced QC samples from a nationally- or internationally-recognized source provider. The results of these analyses are used to determine the lab's ability to produce acceptable data.	M6,1.5.1(g)					**R110**	
Method Validation – Detection Capability [M6,1.5.2a]							
The laboratory has established detection capability for each method/matrix combination. Detection capability may refer to the Critical Value, MDA, or SDWA DL.	M6,1.5.2(a)					**R200**	
The laboratory has documented the procedure used to determine the detection capability.	M6,1.5.2(b)					**R201**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
The laboratory's documentation of detection capability identifies the software used for calculations.	M6,1.5.2(d)					**R202**	
The laboratory utilizes a method capable of providing an MDA that is appropriate and relevant for the intended use of the data.	M6,1.5.2.1					**R203**	
The laboratory determines MDAs using protocol specified in mandated methods. If none specified, lab selects a procedure that reflects instrument limitations and the intended application of the method.	M6,1.5.2.1					**R204A** **R204B**	
The laboratory's MDA includes all sample processing steps.	M6,1.5.2.1(a)					**R205**	
The laboratory performs the initial detection capability in a quality system matrix free of target analytes and interferences at levels that would impact the results.	M6,1.5.2.1(b)					**R206**	
The laboratory determines the detection capability each time there is a change in the test method or instrumentation that affects the analytical detection capability.	M6,1.5.2.1(c)					**R207**	
If performing drinking water analysis for SDWA compliance, the laboratory's detection capability meets the detection limit requirements established in 40 CFR 141.25(c).	M6,1.5.2.2					**R208**	
SDWA compliance laboratories use only approved methods that provide sufficient detection capability to meet the detection limit requirements established in 40 CFR 141.25(c).	M6,1.5.2.2					**R209**	
The detection capability for SDWA compliance is expressed in terms of the DL as defined in Section 1.3.1 instead of Method Detection Limit (MDL) as defined in 40 CFR Part 136, Appendix B.	M6,1.5.2.2					**R210**	
Method Validation – Evaluation of Precision and Bias [M6.1.5.3]							
The laboratory compares results of precision and bias measurements determined during validation with criteria established by method, regulation, or contract, or as established in the lab's quality system (if there are no established mandatory criteria).	M6,1.5.3					**R300**	
The laboratory's method validation documentation includes an evaluation of precision and bias for each analyte of interest characterized across the range of activities that brackets those applicable in samples, including zero activity.	M6,1.5.3(a)					**R301**	
The laboratory's method validation includes all sample preparation steps for each analyte of interest and each relevant quality system matrix.	M6,1.5.3(b)					**R302**	
The laboratory determines the precision and bias of a method each time there is a change in the test method that affects the performance of the method or when	M6,1.5.3(c)					**R303**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
a change in instrumentation occurs that affects the precision and bias.							
Where there are no established criteria for precision and bias, the laboratory documents acceptance criteria based on one or more of the following: i. intended use of the data, ii. applicable regulations, or iii. guidelines in publications such as MARLAP or EPA FEM Document No. 2006-01.	M6,1.5.3(d)					**R304**	
Method Validation – Measurement Uncertainty [M6,1.5.4]							
The laboratory reports results with an estimate of Total Uncertainty expressed as either standard deviation (i.e., a Standard Uncertainty) or a multiple thereof (i.e., an Expanded Uncertainty).	M6,1.5.4(a)					**R400**	
The laboratory reports results with an estimate of Total Uncertainty consistent with GUM or MARLAP or other equivalent approach. For DW compliance testing, Counting Uncertainty may be used in lieu of Total Uncertainty.	M6,1.5.4(a)					**R401**	
The reported uncertainty is expressed in the same unit of measurement as the measurement sample result, or clearly stated otherwise.	M6,1.5.4(b)					**R402**	
Laboratory reports clearly specify the type of uncertainty reported. For Expanded Uncertainty the coverage factor (k) or level of confidence is indicated.	M6,1.5.4(b)					**R403A** **R403B**	
The results of precision obtained from the method validation process are compared to the uncertainty estimates as a check on the validity of the uncertainty estimate. This is not required if only Counting Uncertainty is being reported.	M6,1.5.4(c)					**R404**	
Method Validation – Evaluation of Selectivity [M6.1.5.5]							
The laboratory qualitatively evaluates selectivity with regard to the effect of matrix composition on the ability of the method to detect the analyte.	M6,1.5.5(a)					**R500**	
The laboratory qualitatively evaluates selectivity by addressing the ability of the method to chemically separate the analyte from the interfering analytes.	M6,1.5.5(a)					**R501**	
The laboratory qualitatively evaluates selectivity with regard to spectral and instrumental interferences.	M6,1.5.5(a)					**R502**	
Method validation includes an evaluation of selectivity which may be accomplished by testing matrix blanks, spiked matrix blanks, worst-case	M6,1.5.5(b)					**R503**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
samples, or certified reference materials. If applicable, a qualitative selectivity statement shall be included in the SOP.							
Demonstration of Capability - Refer to the Quality System Checklist [M6.1.6]							
The laboratory ensures that an initial DOC is performed prior to using any method and at any time there is a change in instrument type, personnel or method; or any time that a method has not been performed by the laboratory or analyst in a twelve (12) month period.	M6,1.6.2					**R600**	
If the method, regulation or contract does not specify an initial DOC, DOCs are performed using 4 consecutive test samples and 4 consecutive blank samples of a clean quality system matrix.	M6,1.6.2.2(a)					**R601**	
Where gamma-ray spectrometry is used to identify and quantify more than one analyte, the test sample shall contain gamma-emitting radionuclides that represent the low (e.g., ^{241}Am), medium (e.g., ^{137}Cs), and high (e.g., ^{60}Co) energy range of the analyzed gamma-ray spectra. As noted, the nuclides do not have to exactly bracket the calibrated energy range or the range over which nuclides are identified and quantified.	M6,1.6.2.2(b)					**R602**	
The laboratory has a documented procedure for performing ongoing DOCs	M6,1.6.3					**R603**	
Technical Requirements [M6,1.7]							
Instrument Set-up, Calibration, Performance Checks and Background Measurement [M6,1.7.1]							
The laboratory's instrument QC program incorporates requirements imposed by the method, regulation, contract, or TNI Standard. Where imposed regulations are more stringent than the TNI Standard, the imposed regulations take precedence (see Volume I, Module 2, Section 5.9.3.c). If it is not apparent which Standard is more stringent, the laboratory shall follow the requirements of the regulation or the method in that order.	M6,1.7.1					**R700A** **R700B**	
When there are no established mandatory instrument QC requirements, the laboratory incorporates guidelines consistent with MARLAP or other consensus standard organizations.	M6,1.7.1					**R701**	
Initial Set-up of Instrumentation [M6,1.7.1.1]							
The laboratory maintains the instrumentation required for each method it performs or seeking accreditation.	M6,1.7.1.1(a)					**R800**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
When multiple instruments (or detectors) are used for a common method the results across the instruments are comparable.	M6,1.7.1.1(a)					**R801**	
The configuration and operating parameters for each radiation measurement system (or instrument) are established and consistent with the method requirements.	M6,1.7.1.1(a)					**R802**	
The laboratory documents the radiation measurement system configuration and maintainable values for hardware- and software-related operational parameters prior to initial calibration.	M6,1.7.1.1(b)					**R803**	
The laboratory documents specific deviations from the manufacturer's recommended specifications for the system configuration or operational parameters when such modifications are required or necessary for a specific method(s), and the laboratory documents the rationale for such changes.	M6,1.7.1.1(b)					**R804**	
The laboratory periodically verifies user-maintainable values for operational parameters to ensure their consistency with values recorded at the time of the initial calibration and to ensure the continued integrity of the system configuration.	M6,1.7.1.1(c)					**R805**	
If the system configuration or operating parameters have changed, the laboratory performs corrective actions to determine and ameliorate any potential impact of the changes.	M6,1.7.1.1(c)					**R806**	
Initial Calibration [M6,1.7.1.2]							
The laboratory defines the procedures and documentation for initial calibration of radiation measurement systems and includes the requirements for recalibration any time the following conditions occur:	M6,1.7.1.2					**R900**	
i. following replacement of a key detector element (e.g., a photomultiplier tube, silicon barrier detector, gas proportional detector chamber, germanium crystal, etc.);	M6,1.7.1.2(a) (i-vi)					**R900A**	
ii. after a repair when subsequent performance checks indicate a change in performance;						**R900B**	
iii. after modification of system parameters that affect instrument response;						**R900C**	
iv. when instrument performance checks exceed predetermined acceptance criteria (i.e., limit of a statistical or tolerance control chart or other QC						**R900D**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
parameters) indicating a change in instrument response since the initial calibration; v. when indicated by corrective actions; or vi. when calibration is due according to a predetermined frequency.						**R900E** **R900F**	
The laboratory documents the criteria that initiate (re)calibration in its SOPs.	M6,1.7.1.2(a)					**R901**	
The laboratory performs multiple-point calibration curves to correlate a number of parameters other than activity, such as in the following cases: i. channel-energy calibration of alpha or gamma spectrometers ii. energy-efficiency calibration of gamma spectrometers iii. mass-efficiency (mass-attenuation) calibration of gas-flow proportional or x-ray detectors iv. quench-efficiency calibration of liquid scintillation detectors v. mass-crosstalk calibration of gas-flow proportional vi. quench-crosstalk calibration of liquid scintillation detectors	M6,1.7.1.2(b) (i-vi)					**R902** **R902A** **R902B** **R902C** **R902D** **R902E** **R902F**	
The laboratory bases instrument calibrations on physical measurement of reference standards as defined in Section 1.7.2.6.c and these standards have general physical characteristics (i.e., geometry, density, composition, nuclear decay properties, etc.) that match as closely as possible those of the samples to which the calibration will be applied, except as noted in Section 1.7.1.2.d.	M6,1.7.1.2(c)					**R903**	
The laboratory uses empirical techniques (e.g., gamma transmission) and/or computational techniques (e.g., Monte Carlo or efficiency modeling techniques) to generate corrections that are applied to calibrations performed with reference standards to account for minor differences between the physical characteristics of the calibration standard (i.e., geometry, density, coincidence-summing, etc.) and the samples to which the correction is to be applied, if: i. The laboratory performs documented validation of the correction method or model by physical measurement of reference standards as defined in Section 1.7.2.6.c and the validation spans the entire range of physical characteristics observed in samples to which the correction shall be applied (i.e., geometry, density, etc.); ii. The applied correction consistently minimizes measurement bias across the	M6,1.7.1.2(d) (i-iii)					**R904** **R904A**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
range of physical characteristics; and iii. The laboratory estimates and validates the uncertainty associated with the correction (see Section 1.5.4) and includes it in the uncertainty reported with each associated sample result.						**R904B** **R904C**	
The laboratory establishes and documents the details of the initial instrument calibration and the details, at a minimum, include: a. the type of calibrations to be performed b. the number of calibration points required c. a description of the calibration standards required d. the preparation of the calibration standards e. the counting of the calibration standards f. the maximum permissible uncertainty for calibration measurements (e.g., a maximum relative combined uncertainty of the calibration parameter or a minimum number of counts collected); and g. all calculations	M6,1.7.1.2(e) (i)(a-g)					**R905** **R905A** **R905B** **R905C** **R905D** **R905E** **R905F** **R905G**	
The laboratory establishes criteria, appropriate to the calibration technique, for the acceptance of an initial instrument calibration in written procedures.	M6,1.7.1.2((ii)					**R906**	
The laboratory performs corrective actions if the initial instrument calibration results are outside established acceptance criteria.	M6,1.7.1.2(e) (iii)					**R907**	
The laboratory retains sufficient raw data records to permit reconstruction of the initial instrument calibration.	M6,1.7.1.2(e) (iv)					**R908**	
The laboratory quantitates sample results only from the initial instrument calibrations unless otherwise allowed by regulation, method, or contract.	M6,1.7.1.2(f)					**R909**	
Calibration Verification [M6,1.7.1.3]							
The initial instrument calibration is verified with a reference standard obtained from a source or a lot independent of the reference standard used in the initial calibration by either: i. performing a second set of calibration measurements compared to the initial calibration, or ii. quantifying a set of prepared standards using the initial calibration.	M6,1.7.1.3(a)					**R1000** **R1000A** **R1000B**	
The maximum permissible uncertainty for calibration verification measurements							

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
(e.g., the minimum number of counts collected for each measurement) is specified in the lab's SOPs.	M6,1.7.1.3(b)					**R1001**	
The calibration verification acceptance criteria (e.g., for the relative combined uncertainty of the prepared standard recovery) is specified in the lab's SOPs.	M6,1.7.1.3(c)					**R1002**	
Corrective action is performed if the criteria for the calibration verification are not met.	M6,1.7.1.3(c)					**R1003**	
Instrument Performance Checks [M6,1.7.1.4]							
The laboratory check source used for instrument performance checks need not to be a reference standard as defined in Section 1.7.2.6.c.	M6,1.7.1.4(a)(i)					**SGST**	
The laboratory uses the same check source for ongoing performance checks as the one in the preparation of the tolerance or control chart limits at the point of initial calibration.	M6,1.7.1.4(a) (ii)					**R3001**	
The laboratory shall prepare, handle, seal and/or encapsulate check sources to prevent damage, loss of activity and contamination.	M6,1.7.1.4(a) (iii)					**R3002**	
The laboratory minimizes the uncertainty of the check source count to allow detection of small changes in detector response relative to the acceptance criteria. The count duration and check source activity should be sufficient to provide adequate counting statistics over the life of the source.	M6,1.7.1.4(a) (iv)					**R3003**	
Where significant, the radioactive decay in the check source is taken into account when evaluating count-rate sensitive parameters such as efficiency.	M6,1.7.1.4(a) (v)					**R3004**	
The laboratory monitors the results of instrument performance checks using control or tolerance charts to ensure that instrument performance does not change significantly relative to the point of initial calibration.	M6,1.7.1.4(a) (vi)					**R3005**	
The laboratory procedures specify what corrective actions are to be taken when performance check acceptance criteria are not met, and corrective actions are taken in accordance with those procedures.	M6,1.7.1.4(a) (vii)					**R3006**	
For gamma-ray spectrometry systems: detector efficiency, energy calibration, and peak resolution are checked at the following frequency: a. Semiconductor detectors: At least twice weekly, but not on consecutive days, for a continuously operating detector; day of use for a non-continuously operating detector. b. Scintillation detectors (e.g., sodium iodide): Day of use	M6,1.7.1.4(b) (i)					**R3007** **R3007A** **R3007B**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
For alpha-particle spectrometry systems: a. The energy calibration is checked weekly. b. The detection efficiency is checked monthly.	M6,1.7.1.4(b) (ii)					**R3008A** **R3008B**	
For gas-proportional and semiconductor alpha/beta detectors: the alpha and beta efficiency is checked each day of use.	M6,1.7.1.4(b) (iii)					**R3009**	
For liquid scintillation detectors: a. The manufacturer system calibration is checked at the frequency recommended by the manufacturer. b. The efficiency is checked with unquenched ^{3}H and ^{14}C standards each day of use.	M6,1.7.1.4(b) (iv)					**R3010A** **R3010B**	
Solid-state scintillation detectors (e.g., zinc sulfide) used for non-spectrometric measurements: efficiency is checked each day of use.	M6,1.7.1.4(b) (v)					**R3011**	
Exceptions to minimum performance check frequencies allowing periods longer than the required interval include the following: i. To allow for completion of the test source count as long as instrument performance checks performed at the beginning and end of the measurement period meet all applicable acceptance criteria, and ii. To allow for completion of a Preparation Batch or Radiation Measurement Batch measured on an instrument with an automated sample changer (e.g., a liquid scintillation or gas proportional counter), as long as the period between the checks does not exceed seven (7) calendar days, and checks are done at the beginning and end of the measurement in question and meet all applicable acceptance criteria.	M6,1.7.1.4(c)					**R3012A** **R3012B**	
If the detection system is powered off between performance checks, a new performance check is performed prior to the next Test Source measurement.	M6,1.7.1.4(d)					**R3013**	
Subtraction Background Measurements [M6,1.7.1.5]							
Subtraction background measurements are performed and evaluated separately for each detector and are appropriate to the method.	M6,1.7.1.5(a)					**R3014**	
The subtraction background counting time is at least as long as the longest	M6,1.7.1.5(b)					**R3015**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
associated sample counting time.							
The subtraction background measurement are accomplished in one of the following ways: i. Paired measurements in which the subtraction background measurement is counted before or after the Test Source measurement or batch of Test Source measurements. ii. Measurements performed at a fixed frequency, in which Test Sources may be measured between successive background subtraction measurements. In this case, the laboratory shall perform background subtraction measurements at the following minimum frequencies: a. Gamma-ray spectrometry systems: Monthly. b. Alpha-particle spectrometry systems: Monthly. c. Gas-proportional and semiconductor alpha/beta detectors: Quarterly. d. Liquid scintillation detectors: • Individual quenched background: Once per Preparation Batch. • Quenched background curve: According to frequency specified in laboratory procedures. e. Solid-state scintillation detectors (e.g., zinc sulfide) used for non-spectrometric measurements: Day of use. iii. Composite measurements using combined background measurements collected in a manner that results in a representative determination of the background with a combined counting time at least as long as the longest associated Test Source count time.	M6,1.7.1.5(c)					**R3016** **R3016A** **R3016B** **R3016B1** **R3016B2** **R3016B3** **R3016B4** **R3016B4A** **R3016B4B** **R3016B5** **R3016B6**	
The laboratory has written procedures for performing and evaluating subtraction background measurements and these procedures include the following:						**R3017**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
i. The frequency and length of subtraction background measurements; ii. Control or tolerance charts and acceptance criteria of subtraction background measurements; iii. Monitoring of counts or count rate of a detector or an analytical region of interest for significant changes that introduce bias.	M6,1.7.1.5(d)					**R3017A** **R3017B** **R3017C**	
Corrective action is initiated when the subtraction background has changed since the previous determination such that significant bias is imparted to intervening Test Source measurements.	M6,1.7.1.5(e)					**R3018**	
If corrective action does not resolve the bias the affected results are qualified.	M6,1.7.1.5(e)					**R3019**	
Short-Term Background Checks [M6.1.7.1.6]							
The laboratory has written procedures for performing and evaluating short-term background checks and these procedures include the following: i. The frequency and length of the checks; Note: Short-term background checks are performed after a predetermined number of samples, after a hot sample, or at a predetermined frequency. ii. Control or tolerance charts and acceptance criteria; iii. Monitoring of counts or count rate of a detector or an analytical region of interest for significant changes that introduce bias.	M6,1.7.1.6(a)					**R3021** **R3021A** **R3021B** **R3021C**	
Exceptions to minimum frequencies for short-term background checks can include: i. Uninterrupted counting of an individual Test Source for a time longer than the required time between short-term background checks; ii. Allowing completion of a Preparation Batch or RMB measured on an instrument with an automated sample changer (e.g., a liquid scintillation or gas proportional counter), as long as the period between the checks does not exceed seven (7) calendar days and the checks are done at the beginning and	M6,1.7.1.6(b)					**R3022A** **R3022B**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
end of the measurement period and meet all applicable acceptance criteria.							
Corrective action is initiated when the short-term background has changed since the previous determination such that significant bias is imparted to intervening Test Source measurements.	M6,1.7.1.6(c)					**R3023**	
If corrective action does not resolve the bias the affected results are qualified.	M6,1.7.1.6(c)					**R3024**	
Subtraction background measurements are substituted for short-term background checks if performed with sufficient frequency.	M6,1.7.1.6(d)					**R3025**	
For liquid scintillation detectors, the laboratory checks unquenched short-term backgrounds each day of use.	M6,1.7.1.6(e)					**R3026**	
Contamination Monitoring [M6,1.7.1.7]							
The laboratory has written procedures that address cases where radiation detectors have been contaminated, as determined by the subtraction background measurements, short-term background checks, or method blanks.	M6,1.7.1.7					**R4000**	
Detectors are not brought back into service until corrective actions are completed.	M6,1.7.1.7					**R4001**	
Quality Control for Radiochemistry [M6,1.7.2]							
General [M6,1.7.2.1]							
The laboratory ensures that the essential quality control measures outlined in the Technical Modules or mandated methods or regulation are incorporated in the methods manuals and can demonstrate that it meets all requirements contained in a mandated test method or regulation, even if the requirement is more stringent than the corresponding NELAC Standard. (If it is unclear which requirements are more stringent, the method or regulation must be followed.)	M6,1.7.2.1(a)					**R5000**	
All quality control measures are assessed and evaluated on an on-going basis to demonstrate that the analytical system is in control.	M6,1.7.2.1(b)					**R5001**	
The laboratory employs either a sample Preparation Batch or an RMB to determine the grouping of samples and assignment of batch QC.	M6,1.7.2.1(c)					**R5002**	
A sample Preparation Batch is initiated where sample testing is performed that involves physical or chemical processing which affects the outcome of the test.	M6,1.7.2.1(c)(i)					**R5003**	
Samples and associated QC assigned to a Preparation Batch are prepared together using the same processes, personnel, and lot(s) of reagents.	M6,1.7.2.1(c)(i)					**R5004**	
SGST - Where testing is performed that does not involve physical or chemical processing which affects the outcome of the test (e.g., non-destructive gamma spectrometry, alpha/beta counting of air filters, or swipes on gas proportional detectors), an RMB may be initiated in lieu of a Preparation Batch.	M6,1.7.2.1(c)(ii)					**SGST**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
The samples and associated QC in the RMB share similar physical and chemical parameters, and analytical configurations (e.g., analytes, geometry, calibration, and background correction).	M6,1.7.2.1(c)(ii)					**R5006**	
A RMB is kept open for adding samples no longer than fourteen (14) calendar days from the start of the first sample count, or until twenty (20) environmental samples have been counted, whichever occurs first.	M6,1.7.2.1(c)(iii)					**R5007**	
The laboratory only combines samples and associated QC within an RMB that share a range of physical and chemical parameters, and analytical configurations (e.g., analytes, geometry, calibration, density) that conform to the ranges of physical and chemical parameters, and analytical configurations demonstrated by method validation studies (see V1.M6 Section 1.5).	M6,1.7.2.1(c)(iv)					**R5008**	
The laboratory procedures document how method validation is performed, and laboratory records document any corrections (e.g., for efficiency, density, cascade summing, and background) applied to physical calibrations.	M6,1.7.2.1(c)(iv)					**R5009**	
The laboratory processes all batch QC samples together with and under the same conditions as the associated samples, and uses the same processes and procedures for preparation, analysis, data reduction and reporting of results. NOTE: Although samples in a Preparation Batch must be prepared together, they need not be analyzed concurrently on a single detection system, rather they may be analyzed on different detection systems as long as the detection systems are calibrated for the technique in question and instrument QCs indicate that the systems are in control.	M6,1.7.2.1(e)					**R5010**	
The laboratory does not systematically or preferentially use specific detectors, equipment or glassware for the analysis of QC samples. This should not preclude laboratories from segregating detectors, equipment, or glassware to minimize the risk of cross-contamination of samples or equipment as long as the criteria for segregation applies equally to batch QC samples and samples.	M6,1.7.2.1(f)					**R5011**	
The laboratory assesses the results of the QC samples against acceptance criteria documented in the QC program. Where there are no established criteria in regulations, the method, or contract, the laboratory develops its acceptance criteria consistent with guidelines in MARLAP or other consensus standards, or other criteria such as statistical control charts developed by the laboratory.	M,6.1.7.2.1(h)					**R5012A** **R5012B**	
The laboratory tracks and trends the results of batch QC samples using	M6,1.7.2.1(i)					**R5013**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
statistical or tolerance control charts.							
The laboratory investigates the cause when results do not meet acceptance criteria and take corrective actions to eliminate the source or minimize the magnitude of the problem. The laboratory considers samples associated with failed QC as suspect, and where possible, reprocesses those samples. Where reprocessing is not possible, the laboratory reports results with appropriate data qualifiers.	M6,1.7.2.1(j)					**R5014A** **R5014B** **R5014C**	
Laboratory notes the occurrence of a failed QC sample and any associated actions in the laboratory report.	M6,1.7.2.1(j)					**R5015**	
Negative Control – Method Performance: Method Blank (MB) [M6,1.7.2.2]							
MBs are analyzed at a minimum frequency of one per preparation batch or Radiation Measurement Batch (RMB).	M6,1.7.2.2(a)					**R6000**	
The MB sample Test Source simulates quality system matrix characteristics that significantly affect results, such as geometry, size, and other factors, as appropriate.	M6,1.7.2.2(b)					**R6001**	
MBs are prepared using a quality system matrix that is free of analytes of interest at levels that will interfere with the evaluation of the results. If an analyte-free matrix is not available, the laboratory uses as surrogate matrix to simulate the quality system matrix.	M6,1.7.2.2(b)(i)					**R6002**	
The sample aliquot used for the MB is similar to that of routine samples.	M6,1.7.2.2(b)(ii)					**R6003**	
If the sample aliquot size varies, the laboratory uses acceptance criteria that compensate for differing aliquot sizes (e.g., z-score per MARLAP, Vol. III, Chapter 18, Section 18.4.1).	M6,1.7.2.2(b)(ii)					**R6004**	
The laboratory has procedures to determine if MB results are significantly different than zero or impacts sample analytical results (e.g., Sample specific MDA for MB>required MDA).	M6,1.7.2.2(c)					**R6005**	
Corrective action is taken when the MB result is significantly different than zero and associated sample results are <5 times the MB.	M6,1.7.2.2(d)					**R6006**	
MBs are monitored for long term trend, absolute bias, possible contamination or interferences that affect sample results.	M6,1.7.2.2(e)					**R6007**	
The laboratory does not subtract the batch MB from sample results in the	M6,1.7.2.2(f)					**R6008**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
associated Preparation Batch or RMB.							
If the laboratory subtracts the average historical activity of MBs (which is allowed when bias is demonstrated), it takes into account the uncertainty of the subtracted value in its estimate of uncertainty for the final result.	M6,1.7.2.2(f)					**R6009**	
Positive Control – Method Performance: Laboratory Control Sample (LCS) [M6,1.7.2.3]							
LCS are analyzed at a frequency of one per Preparation Batch or RMB. Note: For RMBs, a calibration verification standard may be used in place of an LCS.	M6,1.7.2.3(a)					**R7000**	
The LCS Test Source simulates quality system matrix characteristics that significantly affect results, such as geometry, size, and other factors, as appropriate.	M6,1.7.2.3(b)					**R7001**	
LCSs are prepared using a quality system matrix that is free of analytes of interest at levels that will interfere with the evaluation of the results. If an analyte-free matrix is not available, the laboratory uses a surrogate matrix to simulate the sample matrix.	M6,1.7.2.3(b)(i)					**R7002**	
The sample aliquot used for the LCS is similar to that of routine samples.	M6,1.7.2.3(b)(ii)					**R7003**	
If the sample aliquot size varies, the laboratory uses acceptance criteria that compensate for differing aliquot sizes (e.g., z-score per MARLAP3, Vol. III, Chapter 18, Section 18.4.3).	M6,1.7.2.3(b)(ii)					**R7004**	
SGST - For methods with minimal physical treatment and no chemical processing, the laboratory may prepare the LCS a single time and reuse the standard with subsequent batches of samples.	M6,1.7.2.3(c)					**SGST**	
LCSs are spiked at a level such that the uncertainty of the result is < 1/3 the acceptance criteria.	M6,1.7.2.3(d)					**R7006**	
The standards used to prepare the LCS conform to the requirements for reference standards as provided in V1.M6.Section 1.7.2.6c when available. The final prepared LCS need not be traceable to a national standard organization.	M6,1.7.2.3(e)					**R7007**	
The LCS include all of the radionuclide(s) being determined with the following exceptions: i. For gross alpha, gross beta, an appropriate surrogate is used. This will generally be the radionuclide(s) used to calibrate the detector.	M6,1.7.2.3(e)					**R7008** **R7008A**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
ii. For alpha spectrometry, only one of the radionuclides need to be included when multiple radionuclides with similar chemical characteristics are determined simultaneously with a single measurement. iii. For gamma-ray spectrometry, measurements are made with radionuclides with similar gamma energies or radionuclides that represent at least the low and high energy ranges used for analysis.						**SGST** **R7008B**	
The batch LCS results are evaluated using a statistical technique such as the percent recovery or z-score that allows comparison to the lab's established acceptance criteria.	M6,1.7.2.3(f)					**R7009**	
When more than one analyte is spiked in the LCS, each analyte is evaluated against the specified acceptance criteria.	M6,1.7.2.3(g)					**R7010**	
Sample-Specific QC Measures (General) [M6,1.7.2.4]							
The laboratory has procedures in place for tracking, managing, and handling sample-specific QC criteria including: - spiking radionuclides at appropriate activities, - calculating recoveries, - determining variability (e.g., relative percent difference and/or z-score), and - evaluating and reporting results based on the performance of the QC samples.	M6,1.7.2.4					**R8000** **R8000A** **R8000B** **R8000C** **R8000D**	
Sample-Specific QC Measures - Matrix Spike (MS) [M6,1.7.2.4a]							
MS are analyzed at the frequency specified by the method, regulation or as determined as part of the contract review process. MSs are not typically employed for non-destructive methods (e.g., gamma spectrometry or direct counting of samples for alpha or beta radioactivity), or for methods that employ a chemical yield tracer or carrier for each sample	M6,1.7.2.4(a)(ii) M6,1.7.2.4(a)(i)					**R9000** **SGST**	
The radionuclides spiked are as specified by the mandated method, regulation or as determined as part of the contract review process. At minimum, they are consistent with those specified for the LCS in V1.M6. Sections 1.7.2.3.e-f.	M6,1.7.2.4(a)(iii)					**R9001**	
The aliquot used for the MS is similar to the routine samples analyzed in the Preparation Batch.	M6,1.7.2.4(a)(iv)					**R9002**	
If the sample size in the Preparation Batch varies (e.g., due to restriction on the activity or mass residue that may be processed), the laboratory applies appropriate corrections to compensate for differing aliquot sizes when applying	M6,1.7.2.4(a)(iv)					**R9003**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
the acceptance criteria for the batch.							
When an MS is required, the lack of sufficient sample aliquot to perform a MS is noted in the laboratory report.	M6,1.7.2.4(a)(v)					**R9004**	
The activity of the MS analyte(s) are greater than five (5) times the MDA.	M6,1.7.2.4(a)(vi)					**R9005**	
The acceptance criteria for MS recoveries are established as specified by the method, regulation or contract.	M6,1.7.2.4(a)(vii)					**R9006**	
Where there are no mandatory acceptance criteria established in the method, regulation or contract, the laboratory has developed acceptance criteria based on industry practices and guidelines, or consistent with the guidelines of MARLAP or other consensus standards.	M6,1.7.2.4(a)(vii)					**R9007**	
The MS acceptance criteria are documented or referenced in the laboratory's quality manual.	M6,1.7.2.4(a)(vii)					**R9008**	
When available, the standard used to prepare the MS meets the requirements for the reference standard provided in V1.M6.Section 1.7.2.6.c when available. The final MS need not be traceable to a national standards organization.	M6,1.7.2.4(a)(viii)					**R9009**	
The MS is prepared by adding a known activity of target analyte prior to performing any processes that affect the analyte of interest (e.g., chemical digestion, dissolution, ashing, separation, etc.).	M6,1.7.2.4(a)(ix)					**R9010**	
Sample-Specific QC Measures - Matrix Duplicates (MD / Matrix Spike Duplicates (MSD) / LCS Duplicates [M6,1.7.2.4b]							
Where applicable, a matrix duplicate (MD) or matrix spike duplicate (MSD) are prepared using a second aliquot of the same sample and carried through the entire analytical procedure. Based on specific project or program requirements or when there is insufficient sample volume available, an LCS duplicate can be used in place of a MD or MSD.	M6,1.7.2.4(b)(i & v)					**RC100**	
Acceptance criteria for duplicates are established as specified by the method, regulation or contract.	M6,1.7.2.4(b)(ii)					**RC101**	
Where there are no mandatory acceptance criteria established in the method, regulation or contract, the laboratory has developed acceptance criteria based on industry practices and guidelines, such as control charting developed by the laboratory, or consistent with the guidelines of MARLAP or other consensus standards.	M6,1.7.2.4(b)(ii)					**RC102**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
The duplicate acceptance criteria are documented or referenced in the laboratory's quality manual.	M6,1.7.2.4(b)(ii)					**RC103**	
At a minimum, the laboratory analyzes one MD per Preparation Batch or RMB. If the batch is counted on more than one detector, the MD shall be performed on a second detector. When samples have low-levels of activity (less than approximately three (3) times the MDA) the laboratory, at its discretion, may analyze MS/MSD to determine reproducibility within a Preparation Batch in place of a MD.	M6,1.7.2.4(b)(iii) M6,1.7.2.4(b)(iv)					**RC104** **SGST**	
For RMBs, the MD consists of a second measurement of one sample.	M6,1.7.2.4(b)(iii)					**RC105**	
If the batch is counted on more than one detector, the MD is performed on a second detector.	M6,1.7.2.4(b)(iii)					**RC106**	
Sample-Specific QC Measures – Chemical Yield Tracers and Carriers [M6,1.7.2.4c]							
For methods that employ a radioactive Tracer or a stable Carrier as a chemical yield monitor in the analysis, the laboratory calculates and reports the chemical yield for each sample. The chemical yield is one of the QC measures to be used to assess the associated sample result acceptance.	M6,1.7.2.4(c)(i)					**RC200**	
A Tracer or Carrier is used that does not significantly interfere with the analyte(s) of interest nor cause bias in its measurements.	M6,1.7.2.4(c)(ii)					**RC201**	
When such a Tracer or Carrier is unavailable, the interference or bias caused is quantified and appropriate correction applied to the sample results.	M6,1.7.2.4(c)(ii)					**RC202**	
The Tracer or Carrier used to monitor chemical yield is added to the sample prior to performing any processes that affect the analyte of interest (e.g., chemical digestion, dissolution, ashing, separation, etc.) unless otherwise specified by the method.	M6,1.7.2.4(c)(iii)					**RC203**	
The chemical yield is assessed against acceptance criteria specified in the method, regulation, contract or laboratory SOP.	M6,1.7.2.4(c)(iv)					**RC204**	
When there are no criteria, the laboratory has developed its criteria for data acceptance based on guidelines established in the MARLAP or other criteria such as control charting developed by the laboratory.	M6,1.7.2.4(c)(iv)					**RC205**	
The chemical yield assessment meets established project or program MQOs (V1.M6.Section 1.3.1).	M6,1.7.2.4(c)(iv)					**RC206**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
When the established chemical yield acceptance criteria are not met, the specified corrective action and contingencies are followed.	M6,1.7.2.4(c)(v)					**RC207**	
The occurrence of a failed chemical yield and the actions taken are noted in the laboratory report.	M6,1.7.2.4(c)(v)					**RC208**	
Data Reduction [M6,1.7.2.5]							
The laboratory has SOPs documenting data reduction, detection capability (e.g., MDA or Critical Level) per V1.M6.Section 1.5.2, and measurement uncertainties per V1.M6.Section 1.5.4.	M6,1.7.2.5(a-c)					**RC300**	
Reagent Quality, Water Quality, and Checks [M6,1.7.2.6]							
Reagents used are analytical reagent grade or better.	M6,1.7.2.6(a)					**RC301**	
The quality of water sources are monitored and documented and meet method specified requirements.	M6,1.7.2.6(b)					**RC302**	
Radionuclide reference standards are obtained from a national metrology institute (NMI), e.g. NIST in the USA or NPL in Great Britain, or from suppliers of NMI reference standards. Alternatively, reference standards may be obtained from an ISO Guide 34:2009 accredited reference material provider, or an ANSI N42.22 reference material manufacturer.	M6,1.7.2.6(c)(i)					**RC303**	
Reference standards are accompanied with a certificate of calibration that meets the requirements of either ISO Guide 31:2000, or ANSI N42.22, Section 8.	M6,1.7.2.6(c)(ii)					**RC304**	
The certificates include at least the following information: manufacturer, radionuclides calibrated, identification number, calibration method, activities or emission rates with associated uncertainties and the confidence limits, standard quantity, activity reference time (date or time as appropriate to the half-life of the radionuclide), physical and/or chemical description of the source, and radionuclide impurities.	M6,1.7.2.6(c)(ii)					**RC305**	
Standards prepared or derived from externally-obtained reference materials are verified against an independent standard obtained from a second manufacturer prior to use for analysis of samples. The use of a standard from a second lot obtained from the same manufacturer is acceptable for use as a second source standard.	M6,1.7.2.6(c)(iii)					**RC306**	
Prior to use, any discrepancies between observed and expected values are							

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
investigated and appropriate measures taken that document the validity of standards.	M6,1.7.2.6(c)(iii)					**RC307**	
The laboratory accounts for radioactive decay/ingrowth whenever decay/ingrowth has occurred between the Activity Reference Date and use that could impact use of the results.	M6,1.7.2.6(c)(iv)					**RC308**	
The laboratory has written procedures for handling, storing, and establishing expiration dates for reference standards.	M6,1.7.2.6(c)(v)					**RC309**	
If there is no known provider of a particular standard (e.g., non-routine radionuclide or non-standard matrix) that is traceable to the International System of Units (SI) and the laboratory uses a standard with less rigorously established traceability, the laboratory obtains from the provider the minimum information described in V1.M6.Section 1.7.2.6.c.ii.	M6,1.7.2.6(c) (vi)					**RC310**	
The laboratory independently verifies the activity of such non-traceable standards prior to use and documents the verification.	M6,1.7.2.6(c) (vi)					**RC311**	
If the laboratory's verification indicates a significant deviation from the original information from the provider, the non-traceable standard is not used unless the discrepancy can be resolved.	M6,1.7.2.6(c) (vii)					**RC312**	
If a non-traceable standard is used for analysis of sample unknowns, the source and any other known limitations of the standard are disclosed in the final report.	M6,1.7.2.6(c)(vii)					**RC313**	
Constant and Consistent Test Conditions [M6,1.7.2.7]							
The laboratory assures that test instruments consistently operate within the specifications required of the application for which the equipment is used, according to V1.M6.Section 1.7.1.	M6,1.7.2.7(a)					**RC314**	
Labware are cleaned to meet the sensitivity requirements of the method.	M6,1.7.2.7(b)					**RC315**	
Any cleaning and storage procedures that are not specified by the method are documented in the laboratory's quality system and records.	M6,1.7.2.7(b)					**RC316**	
The laboratory's radiological control program defines how low-level and high-level samples will be identified, segregated and processed to minimize sample cross-contamination.	M6,1.7.2.7(c)					**RC317**	
The radiological control program includes the measures taken to monitor and evaluate background activity or contamination on an ongoing basis.	M6,1.7.2.7(c)					**RC318**	
Data Evaluation and Reporting [M6,1.7.3]							
Negative Control – Method Performance: Method Blank (MB) [M6,1.7.3.1]							

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
MB results are evaluated for long-term trends, bias, contamination, or interference that may affect results.	M6,1.7.3.1(a)					**RC400**	
If MB acceptance criteria are not met, corrective actions are taken to investigate the source of contamination or other bias.	M6,1.7.3.1(b)					**RC401**	
If MB acceptance limits are not met and sample activity levels are less than or equal to five times the activity found in the MB the associated samples are reprocessed and reanalyzed. If sample activities are greater than five times the activity in the MB, it is acceptable to report qualified results for the samples associated with the blank.	M6,1.7.3.1(b)					**RC402**	
When sample results associated with a failed MB are reported, the failure and associated corrective actions, or inability to complete corrective actions are noted in the laboratory report.	M6,1.7.3.1(c)					**RC403**	
Positive Control – Method Performance: Laboratory Control Sample (LCS) [M6,1.7.3.2a]							
LCS results are calculated in percent recovery or other appropriate statistical measure that allows comparison to established acceptance criteria.	M6,1.7.3.2(a)					**RC500**	
The calculation used to calculate LCS results is documented.	M6,1.7.3.2(a)					**RC501**	
If LCS acceptance limits are not met (M6,1.7.2.3), corrective action is taken to investigate the source of the failure and the associated samples are reprocessed and reanalyzed.	M6,1.7.3.2(b)					**RC502**	
If samples cannot be reprocessed and reanalyzed, the failure and associated corrective actions or inability to complete corrective actions are noted in the laboratory report.	M6,1.7.3.2(b)					**RC503**	
Sample-Specific Controls – MS, MSD, MD [M6,1.7.3.3a]							
MS and MSD results are calculated as percent recovery or other appropriate statistical measure that allows comparison to established acceptance criteria.	M6,1.7.3.3(a)(i)					**RC600**	
MD and MSD precision results are calculated as relative percent difference, zRep (see MARLAP, Vol. III, Chapter 18, Section 18.4.2), or other appropriate statistical measure that allows comparison to established acceptance criteria.	M6,1.7.3.3(a)(i)					**RC601**	
The laboratory documents the calculations of the QC results.	M6,1.7.3.3(a)(i)					**RC602**	
If sample results are reported with a failed MS, MSD, or MD, the corrective action is documented and the data reported with appropriate data qualifying codes.	M6,1.7.3.3(a)(ii)					**RC603**	
Sample-Specific Controls – Tracers and Carriers [M6,1.7.3.3b]							

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
Results for radioactive Tracers or stable Carriers used as chemical yield monitors are calculated as percent yield (recovery) or other appropriate statistical measure that allows comparison to established acceptance criteria.	M6,1.7.3.3(b)(i)					**RC700**	
For alpha spectrometry, evaluation of Tracer acceptability includes evaluation of chemical yield (e.g., uncertainty, variability) and peak resolution.	M6,1.7.3.3(b)(ii)					**RC701**	
Samples associated with Tracers or Carriers that fail to meet acceptance limits are reprocessed and/or reanalyzed. If samples cannot be reprocessed and/or reanalyzed, the failure and associated corrective actions or inability to complete corrective actions are noted in the laboratory report.	M6,1.7.3.3(b)(iii)					**RC702A** **RC702B**	
Evaluation of Sample Results [M6,1.7.3.4]							
Instrument raw data from energy spectral analysis are evaluated to ensure that the target radionuclides are quantified consistent with laboratory procedures and applicable MQOs, and that target radionuclides in the spectra are evaluated for possible interferences.	M6,1.7.3.4(a)					**RC800**	
Results are reviewed for internal consistency, such as the presence of radionuclides consistent with known parent-progeny relationships and expected or likely decay series.	M6,1.7.3.4(b)					**RC801**	
Sample-specific estimates of uncertainty and MDA are evaluated to ensure that MQOs have been met.	M6,1.7.3.4(c)					**RC802**	
If MQOs have not been met, the samples are reprocessed and/or reanalyzed. If samples cannot be reprocessed and/or reanalyzed, the failure and associated corrective actions, or inability to complete corrective actions, are noted in the laboratory report.	M6,1.7.3.4(d)					**RC803A** **RC803B**	
Reporting Results [M6,1.7.3.5]							
Results are reported directly as obtained, with appropriate units, even if the results are negative.	M6,1.7.3.5(b)					**RC900**	
Results shall be expressed with an appropriate number of significant figures.	M6,1.7.3.5(c)					**RC901**	
Radiochemical results are reported with an estimate of uncertainty, as discussed in V1.M6.Section 1.5.4.	M6,1.7.3.5(d)					**RC902**	
The Activity Reference Date is reported in association with all radiochemical	M6,1.7.3.5(e)					**RC903**	

Relevant Aspect of Standards	TNI 2016 Volume 1 Module 6	Y	N	N/A	S	ELAP citation codes	Comments
measurement results.							
Project- or client-specified reporting requirements that take precedence over the requirements of this Standard are documented	M6,1.7.3.5(f)					**RC904**	
Sample Handling (Refer to the Quality System Checklist)	M6,1.7.4						