

UNITED STATES TRANSURANIUM AND URANIUM REGISTRIES
ANALYTICAL PROCEDURE MANUAL

USTUR 010: Chain of Custody, Sample Number Assignment, and Sample Storage

Purpose	Chain of custody, sample number assignment, and sample storage	Method Number	USTUR 010
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SAFETY NOTE: The handling of tissue samples can be hazardous. All personnel who are expected to handle tissue samples shall follow the procedures outlined in USTUR 020.

1. Chain of Custody

- 1.1. Custody of tissue samples at the analytical laboratory of the United States Transuranium and Uranium Registries (USTUR) begins with the receipt of tissues from National Human Radiobiology Tissue Repository (NHRTR) located in Richland, Washington and continues through all phases of sample preparation, measurement, and storage. For information on the procedures used prior to receipt at the laboratory please refer to the Policy and Procedures Manual of the USTUR as stated in procedure R152 and on form F153.
- 1.2. Sample form F153 shall accompany each shipment of samples to the laboratory.
- 1.3. Samples listed on form F153 shall be verified to ensure each sample is received and has been assigned a three digit tissue code ranging from 001 to 999, as specified in section 3.1. This three digit code is assigned by USTUR personnel prior to transfer of tissues from the NHRTR. Total sample weight as well as the weight of the sample sent to the NRC must also be entered.
- 1.4. If it is found that samples are not present or contain incomplete information, it shall be noted in the log book and on the transfer form and brought to the attention of the Radiochemistry Project Director or other available radiochemistry staff.
- 1.5. The completed transfer form shall be placed in an appropriate case history file. See USTUR 030 for Record Storage procedures.
- 1.6. Receipt of samples shall be documented in the logbook.
- 1.7. A hard copy Sample Control Sheet (see USTUR 040) shall be prepared for each sample in the case history file at time of analysis. A sample number for each

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sample in addition to the three digit code shall be assigned according to section 2 of this procedure.

- 1.8. The hard copy Sample Control Sheet shall serve as the chain of custody documentation as well as an analysis sheet for samples analyzed by USTUR radiochemistry staff. Each step in the process of receipt, analysis, reporting, and storage require that the signature of the analyst and date be recorded.
- 1.9. Sample storage shall be conducted according to section 4 of this procedure.
- 1.10. Samples which were originally dissolved by Los Alamos National Laboratory (LANL) shall be processed to separate them by the Registry Case Number. Sample number assignment shall occur according to section 2.1.
- 1.11. Samples which have been previously prepared at a site other than LANL shall also be assigned a sample number according to section 2.2.
- 1.12. Tissue samples that have not been previously processed shall follow the sample number assignment procedure as stated in section 2.3.

2. Sample Number Assignment

- 2.1. Sample number assignment of previously dissolved tissues
 - 2.1.1. Some USTUR tissue samples have been previously dissolved and in some cases analyzed at LANL. These samples shall be assigned a USTUR sample number as described in 2.2 using USTUR case numbers.
 - 2.1.2. USTUR tissue samples which are derived from a site other than LANL or WSU shall be assigned a case number by the NHRTR and sample numbers according to section 2.2.
- 2.2. Sample number assignment of previously undissolved tissue samples shall be handled as follows:
 - 2.2.1. Use the total case worksheet, form F153, to identify the unique, three (3) digit number which has been assigned sequentially to each of the samples. The range of numbers is from 001 to 999.
 - 2.2.2. This unique 3-digit number shall be used to assign a unique sample code by which that sample shall be identified.
 - 2.2.3. Each sample code will consist of seven (7) characters prepared using the following structure:

bbbccc

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bbbb Four digit Registry Case Number. Range 0001 to 9999.
ccc Three digit tissue code assigned in 2.2.1. Ranges 001 to 999.

For example, 0206267 represents USTUR Case Number 206, tissue sample number 267.

2.3. Assignment of analysis number for each sample

2.3.1. Assign a single character (from A to Z) to the sample number for each analysis to be conducted for that sample. This can be extended to include 0-9 if necessary.

Example: 0206267C represents analysis C for sample 267 of case number 0206.

2.3.2. This last digit is assigned routinely based on the analyte of interest as a general rule.

Example: 0206267A represents analysis A for sample 267 of case number 0206, typically for americium.

2.3.3. This last digit is assigned for each analysis and must be unique. Therefore, if an analysis is repeated, a new character is assigned to prevent confusion. This new label will normally be the next letter after the letter used for the 1st analysis (except in the case of thorium which uses an 's').

Example: For a plutonium, americium, and a re-run on plutonium, the following analysis numbers would be generated for sample 0206267:

0206267P	First plutonium analysis
0206267Q	Second plutonium analysis
0206267A	First americium analysis
0206267B	Second americium analysis
0206267T	First thorium analysis
0206267S	Second thorium analysis

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Typical:

A,B,C ≡ 1st, 2nd, and 3rd americium analysis
P,Q,R ≡ 1st, 2nd, and 3rd plutonium analysis
U,V,W ≡ 1st, 2nd, and 3rd uranium analysis
T,S ≡ 1st, and 2nd thorium analysis

2.4. Sample number assignment for QA/QC samples, test samples, and blanks.

2.4.1. Quality assurance and quality control, test, and blank samples shall be numbered using up to an eight (8) digit alpha-numeric code with the following structure:

DeeeeeeF

D ≡ Single character designation used to identify the sample type. Range A to Z.

L ≡ Blank

X ≡ QA/QC sample

T ≡ Test sample

eeeeee ≡ Up to six (6) digit numeric designation sequentially assigned for each sample type. Range 1 to 999999.

F ≡ Assigned analysis number (see 2.3).

For Example, L684A represents blank sample number 684 for analysis A (typically americium).

2.5. Nomenclature of background, energy calibration, and efficiency computer files.

2.5.1. Background, energy calibration, and efficiency files for alpha spectrometry have the following structure:

Abbccddd

A ≡ Character code for file type

E ≡ energy calibration

F ≡ efficiency calibration

B ≡ background

S ≡ standard count

C ≡ contamination check

bb ≡ 2 digit code for detector number. Range 01 to 32.

cc ≡ last two digits of year

ddd ≡ Julian day

2.5.2. Files are numbered based on the date they began.

Example: B0995031 represents a background count on detector 9 on January 31, 1995.

4. Sample Receipt and Storage

ONLY personnel who have had biohazard training and who have been vaccinated for Hepatitis B may handle human tissue.

4.1. Tissue Samples

4.1.1. Following shipment from the National Human Radiobiology Tissue Repository (NHRTR), tissue samples are checked, unpackaged and prepared for analysis in a room approved for biohazard work.

4.1.2. All handling of tissues will be carried out in an approved biohazard hood prior to dissolution or storage, according to USTUR 020. Each sample is checked according to section 1 for chain of custody issues.

4.1.3. Tissue samples are stored in the locked freezer located in room 215 of the Nuclear Radiation Center (NRC) prior to dissolution.

4.1.4. Tissue samples which have been completed (and thus are in a dissolved state) are stored according to section 4.2.

4.2. Dissolved Samples

4.2.1. Previously dissolved samples received from LANL, as well as samples dissolved by WSU USTUR radiochemistry staff are stored in room 21 of the WSU NRC. These samples are grouped by the Registry Case Number.

4.2.2. Samples from Registry Cases which have been completely analyzed are placed in boxes with the Registry Case Number and the sample numbers listed on the outside of the box. These samples are stored in room 21 of the WSU NRC until it is appropriate to transfer the solutions to the NHRTR for permanent storage.