Standard Operating Procedure

Gamma Detector

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| **Department:** | Earth and Environmental Sciences |
| **Date SOP was written:** | 9/19/2013 |
| **Date SOP was approved by PI/lab supervisor:** | 9/19/2013 |
| **Principal Investigator:** | Steven Goodbred |
| **Internal Lab Safety Coordinator/Lab Manager:** | Richard Bradshaw |
| **Lab Phone:** | Click here to enter text. |
| **Office Phone:** | S. Goodbred (615) 322-4511 (campus phone: 2-4511) Bradshaw (615) 343-0839 (campus phone: 3-0839) |
| **Emergency Contact:** | S. Goodbred (615) 916-9259  R. Bradshaw (208) 260-2792 |
|  |
| **Location(s) covered by this SOP:** | *SC1110B* |
| *(Building/Room Number)* |

**Type of SOP:** ☒ Process ☐Hazardous Chemical ☐ Hazardous Class

**Purpose**

**Personal Protective Equipment (PPE)**

**Respirator Protection**

**Eye Protection**

ANSI approved, tight-fitting safety glasses/goggles and/or face shield.

**Body Protection**

Remove any loose jewelry around your neck or any jewelry on your hands and wrists. Tightly secure long hair in ponytail.

**Ear Protection**

Ear protection in the form of ear muffs or ear plugs must be worn during operation.

**Engineering Controls**

**Medical Emergency**

To contact the [Vanderbilt University Police Department](http://police.vanderbilt.edu/) in an emergency:

* Call **911** from any campus phone.
* Call **(615) 421-1911** from any other phone.

**Protocol/Procedure**

**Report any problems or abnormalities with the equipment immediately to the PI or LM.**

**\*\*\*NEVER leave the machine unattended while operating\*\*\***

A few days prior to running your samples:

1. Turn on the Ortec DSPEC Jr 2.0 first, then either turn on or reboot the PC adjacent to the DSPEC Jr. (Note to reboot: this gamma detector computer is accessed remotely using VNC from the lab Workstation computer. On the Workstation, open VNC-Gamma Detector icon on the Desktop to view the gamma detector computer and reboot from the Start Menu.)
2. Turn on the Ortec CryoSecure Compressor. Press and hold the small Initialize button until the indicator lights to the right stop flashing (~5 sec). Then press and hold Initialize again (~5 sec) until the warming button is no longer illuminated. The compressor will kick on, and start cooling the chamber. It will take 2-3 days for the chamber to cool completely, and the Bias Off light will no longer illuminate.

Once the chamber is cooled and ready to receive samples:

1. Open the Gamma Vision software (Workstation computer: VNC-Gamma Detector>Gamma Vision).
2. Go to Acquire>MCB Properties>High voltage. Turn the high voltage ON.
3. Go to Acquire>MCB Properties>About. Input your sample name and hit close.
4. Open the lead shielding for the detector and place your sample within. Close the lead shielding.
5. Press the GO button in the Gamma Vision software. Input the sample name again. Note that the live time is ticking, and make a note in the notebook of your sample ID and start date and time.
6. Close the VNC-Gamma Detector window and let the sample run for ~24 hrs.
7. After ~24 hours, open the Gamma Vision software from the VNC-Gamma Detector program. You will see peaks at varying KeV, and “Regions of Interest” already delineated. For example, peaks for Be and Cs occur at ~ 477 and 661 KeV, respectively.
8. Press the STOP button. In the notebook, record the date and time, Live time, and if peaks of interest are present (if applicable).
9. Go to File>Save As>Bangladesh and save your sample results in an appropriately named Folder for your study.
10. Go to Acquire>Clear.
11. If you have more samples to run, repeat steps 3-10 until all samples are complete.
12. Once all samples are run and the detector can be turned off, turn OFF the high voltage (follow Step 2), close the programs, and then power down the Ortec CryoSecure Compressor and DSPEC Jr 2.0.

To recall files and get info for “Regions of Interest” (ROI):

* Go to File>Recall>[Filename]
* ROI>Recall File>BangladeshROI
* Get info for the following ROI peaks:

46 KeV (Pb-210)

63 (Th-234)

295 (Pb-214)

351 (Pb-214)

477 (Be-7)

609 (Bi-214)

661 (Cs-137)

1460 (K-40)

* Record Net Area and ± Error for all peaks.

**NOTE**

Any deviation from this SOP requires approval from PI.

**Documentation of Training** (signature of all users is required)

* Prior to conducting any work with the Gamma Detector, LM or designated personnel must provide training to his/her laboratory personnel specific to the hazards involved in working with this substance, and emergency procedures.
* The Principal Investigator must provide his/her laboratory personnel with a copy of this SOP.
* The Principal Investigator must ensure that their laboratory personnel have attended appropriate laboratory safety training and are current with any refresher training required.

I have read and understand the content of this SOP:

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| **Name** | **Signature** | **Identification** | **Date** |
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