

(b) (5)



(b) (5)





# United States Department of the Interior

NATIONAL PARK SERVICE  
Intermountain Regional Office  
12795 W. Alameda Parkway  
P.O. Box 25287  
Lakewood CO. 80228-2822



IN REPLY REFER TO:  
IMR-SHW

## Memorandum

To: Superintendent, Grand Canyon National Park

From: IMR Occupational Safety & Health Manager

Subject: **Radiation Program Assistance**

On or about June 11, 2018 this office received a request for assistance with a radiation issue at your location. After reviewing supplied documents NPS-GCNP-RMC-01 Dated June 20-22, 2000, and Revision #1 Dated July 18, 2000 a decision was made to deploy. I departed Lakewood, CO on June 13, 2018 and traveled to Southeast Utah Group Headquarters (SEUG) Moab, UT. to pick up equipment. I arrived at GRCA on June 14, 2018 at approximately 11:00 AM and proceeded to the Museum Warehouse and met with Colleen L. Hyde and Kim Besom. GRCA Safety Manager Elston Stephenson arrived shortly afterward. After in-briefing with Colleen and Kim, and short interview, I started a radiation survey as described below. After confirming the presence of radioactive ore samples in the Museum Collection, the Parks decision was to remove and dispose of the items of concern. Permission was received, to return these items to the Lost Orphan Mine where they originated. This was accomplished on June 18, 2018.

### Museum Collection:

A hasty survey was conducted of Archives Room cabinets, and three plastic buckets stored in the warehouse. Results were positive for radioactivity above background as noted below:

1. 2.02 mR/hr Outside building, sunny, day, background
2. 1.85 mR/hr Inside building
3. 13.9 mR/hr Between cabinet NB16 and NB18
4. 800 mR/hr depending on the sample On contact with the ore sample inside the bucket
5. 280 mR/hr to 320 mR/hr On contact with outside of bucket - lid sealed
6. 0 above background Distance of 5 ft. from bucket
7. 2.5 mR/hr - 3 mR/hr On contact with outside of metal cabinet, on a seam

A further survey of the rest of the Museum Collection Building, offices and storage areas were negative for radioactivity above background. On Friday June 15, 2018 a second survey was conducted to identify and segregate the items of concern from the museum Collection. Readings were in keeping with the report of July 18, 2000 and these items were prepared for transport and disposal.

### **Basement of Headquarters Building:**

An in-depth survey of the basement area where Radioactive Ore samples were originally stored was negative for radioactivity above background. No radiation issue noted.

### **Power House**

An in-depth survey of the Grand Canyon Power House was conducted and was negative for radioactivity above background. No radiation issue noted.

### **Conex Adjacent to Fee's Building**

This container is the storage location for Ore samples that are part of a legal proceeding. This location has signage stating it is a Radiation Storage Area. There is minor activity above background on contact of outside container wall. A key was not available for access so radiation levels inside are unknown. Container offers good shielding and protection to employees.

### **Trail of Time**

Trail of Time has several rock displays along its length. Entire trail was surveyed and was negative for radioactivity above background. No radiation issue noted.

### **Recommendations:**

As defined in Title 10, Section 20.1003, of the Code of Federal Regulations (10 CFR 20.1003 ), **ALARA is an acronym for "as low as (is) reasonably achievable.** This should be the standard for exposure to any radioactivity. Grand Canyon by its location and surrounding geology has an abundance of naturally occurring radioactivity.

By the nature of the items stored in the museum collection, there is still low levels of radioactivity. Core samples stored in one of the cabinets should be controlled for exposure. Some recommendations are:

1. No one under 18 years of age should be allowed to handle or work with these core

samples or anything known or believed to be radioactive.

2. Consider relocating Core samples to an outdoor metal cabinet.

3. Install real time digital Radon monitor for the Museum Collection archive room.

In addition to recommendations for the Museum Collection, I also recommend that the Conex storage site be limited to Sample storage only, and not a combined use area. Access should be limited/controlled.

**Equipment:**

All survey and monitoring was conducted with the following equipment:

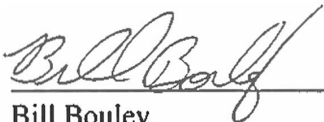
Ludlum Model 3001 Serial Number # 25015388

Ludlum Detector Model 44-2 Serial Number # PR369634

Ludlum Detector Model 44-9 Serial Number # PR368091

Check Source Cs-137, CS72 Jan 2017

Certificate of Calibration Dated 6 OCT 2017, Calibration due 6 OCT 2018 Ludlum Industries.



Bill Bouley,

IMR Occupational Safety & Health Manager

Radiation Safety Officer

Aug. 13, 2018  
Date