



State of New Jersey

Christine Todd Whitman  
Governor

Department of Environmental Protection

Robert C. Shinn, Jr.  
Commissioner

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May 7, 1997

Superintendent LeRoy Seitz  
Woodbridge School District

Via: Fax 908-750-3493

Dear Dr. Seitz:


On May 6, 1997, we were alerted to a possible radiation hazard at the Colonia High School. Our information indicated that a science teacher had identified a rock (5cm by 7cm by 1cm) as having an elevated level of radiation. Various state and local responders were present in the evening of May 6, and, upon advice from our office, the rock was placed in a plastic bag, in a can, and taken off site to a laboratory in Piscataway. On May 7, 1997, Mr. William Cszasz reported to the school, reviewed available information, and performed a limited survey of the area. He indicated to you that there was no residual contamination.

Rocks, such as the one identified by your science teacher, are present in classrooms in schools throughout the country and are used as teaching tools in the study of radioactivity. Radioactivity is ubiquitous in the environment.

Based on our information regarding the rock, and the surveys conducted by Mr. William Cszasz of our staff, we are confident that it is safe for the children to return to school at this time.

Please contact me if you have any further questions.

Sincerely,

  
Jill Lipoti, Ph.D.,  
Assistant Director

## Turn-Key Environmental Services

P.O. Box 519  
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[908] 362-1153 // Phone & FAX

### TO THE FOLLOWING FACILITY/MUNICIPAL REPRESENTATIVES & ASSOCIATED CONTRACTORS:

Woodbridge Township School District	Anthony D'Orsi [908] 602-8551 // FAX x634-2189
Woodbridge Township Division of Health:	Philip Bujalski [908] 855-0600 // FAX x855-0944
PMK Industrial Hygiene Group:	Jeffrey Reynolds [908] 686-0044 // FAX x686-0715
AWT Environmental Services:	Paul Kosovich [908] 613-1660 // FAX x613-1536

FROM AGENT ON-SITE: Jerry DeMenna, Analytical & Geological Scientist

### STATUS of WORK PERFORMED at COLONIA HIGH SCHOOL, Tuesday PM, 6 May 1997:

Arrived at site 10:50PM, escorted to specific building by Mr. D'Orsi. After introductions and presentation of protocol and bona fides; escorted to storage room by Mr. Reynolds. Room was opened and the specimen, shielded in a metal box, under a lead metal foil, was pointed out as the item of concern.

[1] Wearing metallized neoprene rubber gloves, the immediate area was checked by Geiger-Mueller Tube counter (GM counter) to ascertain a baseline level for the room, which was estimated at 0.01 mR/hour. The lead metal foil was removed and the lid of the box opened.

**PHYSICAL:** The specimen was roughly square in shape; and measured ~10cm. wide X ~8cm. thick X ~3cm. thick, with a mass of ~400 grams (slightly less than 1 pound). The visible portion of the specimen appeared to be primarily an amorphous pale gray-pink pegmatite matrix with a yellow-green surface crust covering ~35% of the specimen. Small gray crystalline masses were also seen on the specimen, indicative of a weathered (aged/exposed) pegmatite ore body.

**RADIOACTIVITY:** The upper surface of the specimen was examined by GM counter directly to ascertain a TOTAL radiation count, measured as TWA of 1mR/hour at the surface, 0.2 mR/hour at 15cm. (~6") from the sample and less than 0.05mR/hour at 30cm. (~12"). Using a 10mil thick square of paper, the readings were reduced to 0.4 mR/hour; indicating a rough estimate of 60% alpha-based radiation. Using an 0.5cm. thick piece of Plexiglass (Lucite) plastic, the readings were further reduced to 0.2 mR/hour, indicating a rough estimate of 20% beta-based radiation. A metallized Lead-Aluminum foil plastic laminate reduced the readings to <0.1 mR/hour, indicating the remaining 20% comprised of gamma-based radiation. Both the metal storage box and the initial cardboard storage box were found to be radiation free.

**FLUORESCENCE:** All surfaces of the specimen were examined with both a long-wave Ultra-Violet (UV) light (366nm. emission) and a short-wave UV light (254nm.) to identify the exact radioactive portions of the specimen and also to identify areas where any dust would have contaminated exposed surfaces. The response color is an intense vivid green-yellow. The initial cardboard storage box was found to be free of any radiological or fluorometric contamination. The metal storage box was also fully examined and found to be contamination-free.

=> PRELIMINARY OBSERVATION: The specimen of concern appears to be a classic weathered pegmatite vein with a limited surface deposit of Autunite/meta-Autunite.

[2] The specimen was safely removed from the metal storage box and placed in a heavy-gauge plastic storage bag, over-wrapped in heavy-gauge Aluminum foil and sealed in a lead foil/plastic barrier bag. This wrapped specimen was placed in a lead-lined Tin can and sealed shut for removal & transportation.

[3] The cardboard storage box was examined by both instruments and found to be clean. It was properly disposed of by Mr. D'Orsi.

[4] The metal temporary storage box was examined by both instruments and found to be clean. To satisfy the attending representatives, the box was cleaned twice with a radiation decontamination soap solution. All wipes used and the recovered solutions were bagged for storage at our Lab facility in NJ. The metal box was left in the storage room with the lead foil. It was properly handled by Mr. D'Orsi.

[5] Room 126 was examined by GM Counter and Fluorescence to determine if any contamination exists. Three (3) floor spots, one (1) cabinet corner and seven (7) desktops were tested. No response was measured by either instrument, and a recommendation for a general soap-based cleaning be performed.

[6] In room 126, five (5) boxes of small (1"-3") mineral specimens, located on the central benchtop in the front of the room, were bulk-checked for any indications of radioactivity or fluorescence. A reading slightly above the background level, primarily non-hazardous alpha-radiation, was found to be present in a golden "Twix" box marked "5" in the upper left corner. The level was below 0.2 mR/hour and did not constitute an action item. The custodian representative on site, Mr. Meyler, replaced the boxes in the wooden wall cabinet after the examination.

[7] In the wooden wall cabinet on the left wall of room 126, nine (9) additional boxes and five (5) egg cartons of assorted mineral samples were tested for any indications of radioactivity or fluorescence. No response was measured by either instrument, and no action was recommended.

Collection materials, instruments and safety gear was packed up by this agent and removed from the building at 11:55PM, 6 May 1997; for transport to CHEM-CHEK Laboratories, 44 Stelton Road, #325, Piscataway, NJ 08854; for analysis and confirmational identification. As a trained and licensed professional, Jerry DeMenna accepted custody of the specimen, relieving Woodbridge Township of its responsibility from that point. On Wednesday, 7 May 1997; the following physical, optical and chemical tests were performed on the specimen and microscopic parts of the specimen to confirm the observed identification:

**MATRIX MINERAL =**

PHYSICAL: Specific Gravity: 2.4, Mohs Hardness: 6, Color: pale pink-gray, Fracture: conchoidal, Cleavage: prismatic, Luster: greasy, Appearance: primarily amorphous with isolated gray prismatic masses.

CHEMICAL: ~63% SiO<sub>2</sub>, ~15% Al<sub>2</sub>O<sub>3</sub>, ~12% K<sub>2</sub>O, ~3% Na<sub>2</sub>O, ~2.5% PO<sub>4</sub>, ~1.5% CaO, ~1% MgO, ~0.5% Fe<sub>2</sub>O<sub>3</sub>, ~0.1% MnO, ~0.05% REO (total), LOI: ~1% H<sub>2</sub>O; 99.65% material accountability.

Done by Microwave Digestion preparation and D-C Plasma Emission / Graphite Furnace Atomic Absorption assay.

OPTICAL: No measurable Fluorescence or Phosphorescence by Spectrophotofluorometry, Fourier-Transform Infra-Red scan exhibits primary peaks for Orthoclase (Pegmatite/Feldspar).

**ISOLATED SURFACE COATING =** [NOTE: Some examinations done by video-microscopy]

PHYSICAL: Specific Gravity: 2.9, Mohs Hardness: ~3, Color: lemon-yellow, Fracture: hackly, Cleavage: tabular, Luster: pearlescent, Appearance: microcrystalline, effloresced (dehydrated) coating.

CHEMICAL: ~55% UO<sub>3</sub>, ~16% PO<sub>4</sub>, ~5% CaO, ~4% SiO<sub>2</sub>, ~3% K<sub>2</sub>O, ~1.5% MgO, ~1% Al<sub>2</sub>O<sub>3</sub>, ~0.5% Na<sub>2</sub>O, ~0.15% REO (total), LOI: ~10% H<sub>2</sub>O; ~95% material accountability due to limited sample size.

Done by Microwave Digestion preparation and D-C Plasma Emission / Graphite Furnace Atomic Absorption assay.

OPTICAL: Primary "uranyl" emission peaks at 530nm. and 670nm. by 254nm. Excitation Spectrophotofluorometry, Fourier-Transform Infra-Red scan exhibits primary peaks for Apatite (binary Phosphate).

ISOTOPIC [relative percentages of radioactive species]: U238: 98.1%, Th232: 1.1%, U235: 0.6%, U234: <0.005%

Done by D-C Plasma / Echelle Spectrometry with primary emission lines.

RADIO-ASSAY: Requires extended time study for half-life decay evaluation.

**FINDINGS:** Specimen confirmed as a pegmatite/Feldspar-type matrix with a trace amount of Autunite on the upper surface. Radiation activity level is not hazardous, sample is intact and non-friable, and presents no particulate or dust hazard. ACTION: Pack for safe storage or place in a museum or collection for display.

End Site Evaluation & Sample Report / gjdm



cc: Bob Greco / Turn-Key Environmental Administration  
Peter Postorino / AWT Environmental Administration