



Decommissioning Initiative

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Decommissioning Initiative

- In February 2007, NRC Region III began a Decommissioning Initiative to evaluate Material Licensees' Compliance with Decommissioning Regulations
- Prior NRC License Reviews and Inspections suggested that decommissioning requirements may not be adequately implemented

- Conducted 8 Decommissioning Focused Inspections between February 2007 and March 2008
 - 3 Medical
 - 3 Manufacturing and Distribution (M&D)
 - 1 Academic Research and Development
 - 1 Commercial Research and Development

Decommissioning Requirements

- 10 CFR 20.1402 Radiological Criteria for Unrestricted Use
 - 25 mrem / yr for unrestricted release
- 10 CFR 30.35 (g) Decommissioning Recordkeeping
 - Maintain a single document of restricted areas (>65 days) and ensure that it is updated every 2 years

Results of the Initiative

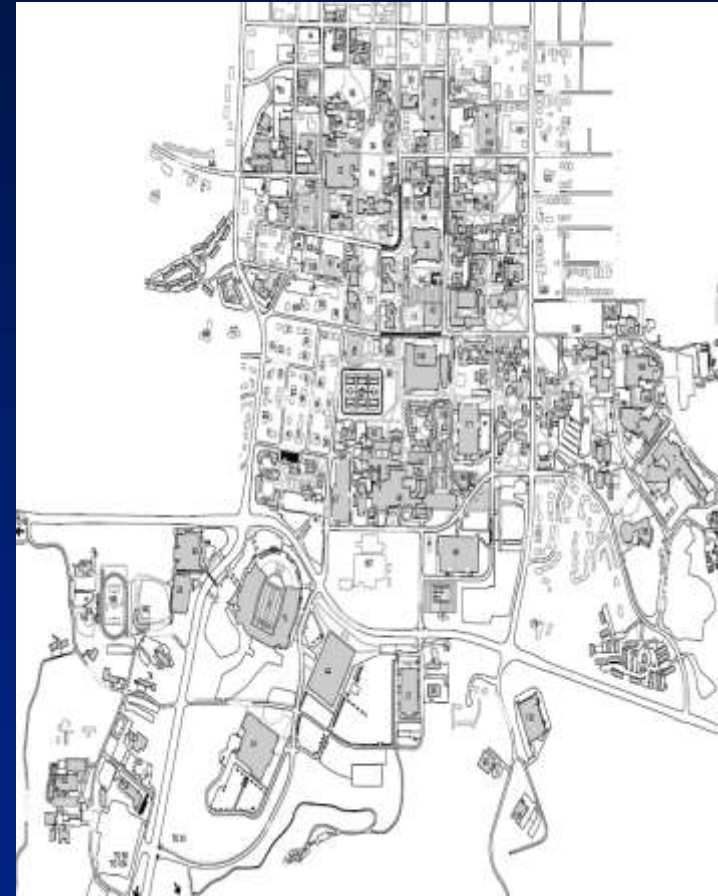
- From the 8 licensees inspected, 13 Violations were identified:
 - 5 violations for failure to maintain adequate records important to decommissioning (NRC Identified)
 - 6 violations for failure to adequately demonstrate compliance with unrestricted release criteria (NRC Identified)
 - 1 violation for failure to receive required authorization prior to performing a remediation activity (NRC Identified)
 - 1 non-cited violation for failure to submit a timely Decommissioning Plan (Licensee Identified)
- The Initiative Results are documented in Information Notice 2009-30

Case Study: University of Missouri

- University of Missouri was inspected in April 2007 as part of Initiative
- 3 Violations Identified
 - Performance of an unauthorized Remediation Activity
 - Failure to adequately demonstrate compliance with the unrestricted release criteria
 - Failure to keep a Single Document listing all designated and formerly designated radiological restricted areas

University of Missouri Corrective Action

- Promptly Conducted a Thorough Campus-Wide Historical Site Assessment to locate Potential Sites of Unknown Radiological Material
- Performed Scoping Surveys in buildings suspected to have unknown Radiological Material



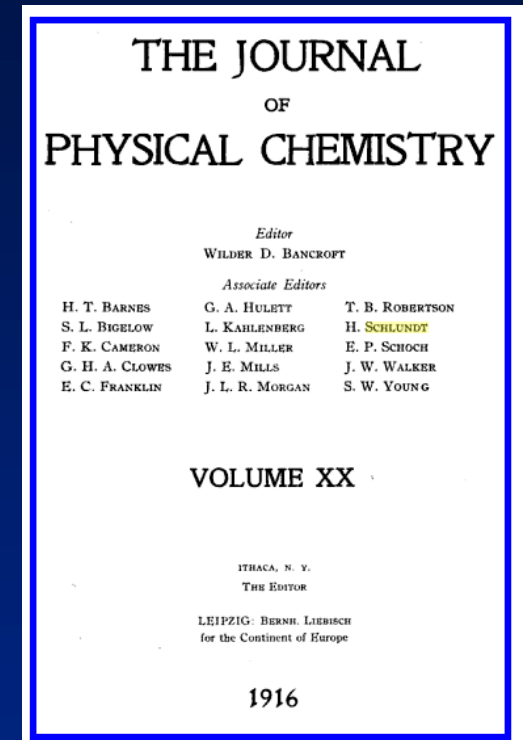
Pickard Hall

- Records identified past use of Naturally Occurring Radioactive Material (NORM) in Pickard Hall
- History of Pickard Hall
 - Built in 1892
 - Originally housed the University's Chemistry Department
 - Underwent Major Renovations in 1974



Historic Research in Pickard Hall

- Professor Schlundt conducted Radium-226 Extraction research in a basement Chemistry Laboratory in the early 1900's
- Published Radium Extraction Techniques in multiple scientific journals
- Records indicate additional research on Thorium-232 daughters



Today at Pickard Hall



- Department of Art History
- Department of Archaeology
- Museum of Art and Archaeology



University's Response

- Began a Scoping Survey in 2008 in response to the NARM rule change
- Hired a contractor to perform a Characterization Survey to determine the Extent of Residual Contamination
- Promptly Restricted Access to areas with removable contamination and elevated dose rates to Protect the Public Health and Safety

Characterization Results

Area	Average Dose Rate ($\mu\text{R/hr}$)	Maximum Dose Rate ($\mu\text{R/hr}$)
Basement	20	112
1 st and 2 nd Floor	7	12
Attic	3	17

Dose Rates provided are above background

Dose Rates verified by NRC Confirmatory Survey in January 2010

Removable Contamination



- Localized areas of Removable Alpha Contamination identified in mechanical room and around historic brick chimneys in the attic
- University Restricted Access to these areas

Soil Contamination



Two discrete areas of Surface Soil and Building's Steam Access Tunnel contained elevated Ra-226 and Th-232 concentrations

Remediation Activities

- Remediated the Two Discrete Areas of Surface Soil Contamination
- Applied Epoxy to the Mechanical Room to Minimize the Potential for Spreading Removable Contamination
- Removed Top Layer of Soil in the Building's Steam Access Tunnel

Dose Assessment

- All building Occupants' Doses were determined to meet Public Dose Limits
- Localized Areas of the Building did Not meet Unrestricted Release Requirements
- The University promptly restricted Access to the Attic, the Mechanical Room, and one Office Space

Additional Sites Identified

- Former Sanitary Lagoon containing Carbon-14 Contamination at a M & D Facility
- M&D Facility with Plans to Cease Licensable Activities which Required a Decommissioning Plan
- Extensive Soil Contamination at an Operating M & D Facility

Conclusion

- 12 Decommissioning Violations identified from 8 Inspections conducted in approximately One Year
- Thorough Historic Site Assessments can Identify Unknown Radiological Contamination from Uses that predate record and licensing requirements
- Always be on the Look Out for the Next Legacy Site!