

BROOKHAVEN NATIONAL LABORATORY

Sealed Source Contamination Incident

October 13, 2011



Cesium (Cs-137) Source Failure

- On September 28th @ ~1600 contamination event discovered
 - Two Radiological Control Technicians (RCTs)
 - Bldg 923 hallway and parking lot
 - Government vehicle used by the two RCTs
 - Personal vehicle that one RCT was passenger in
 - Several area radiation monitors tested with the source
- Contamination was from a Cs-137 (265 micro-curie) “sealed source” used to test area radiation monitors.
 - Source is required to be leak checked semi-annually. Was last leak checked July 22, 2011 (passed with no leakage)

Cs-137 Source



Cs-137 Sealed Source and Lead Pig



Sealed Source and Lead Container

RCT 1 Shoes





BNL SITE BOUNDARY

930

923

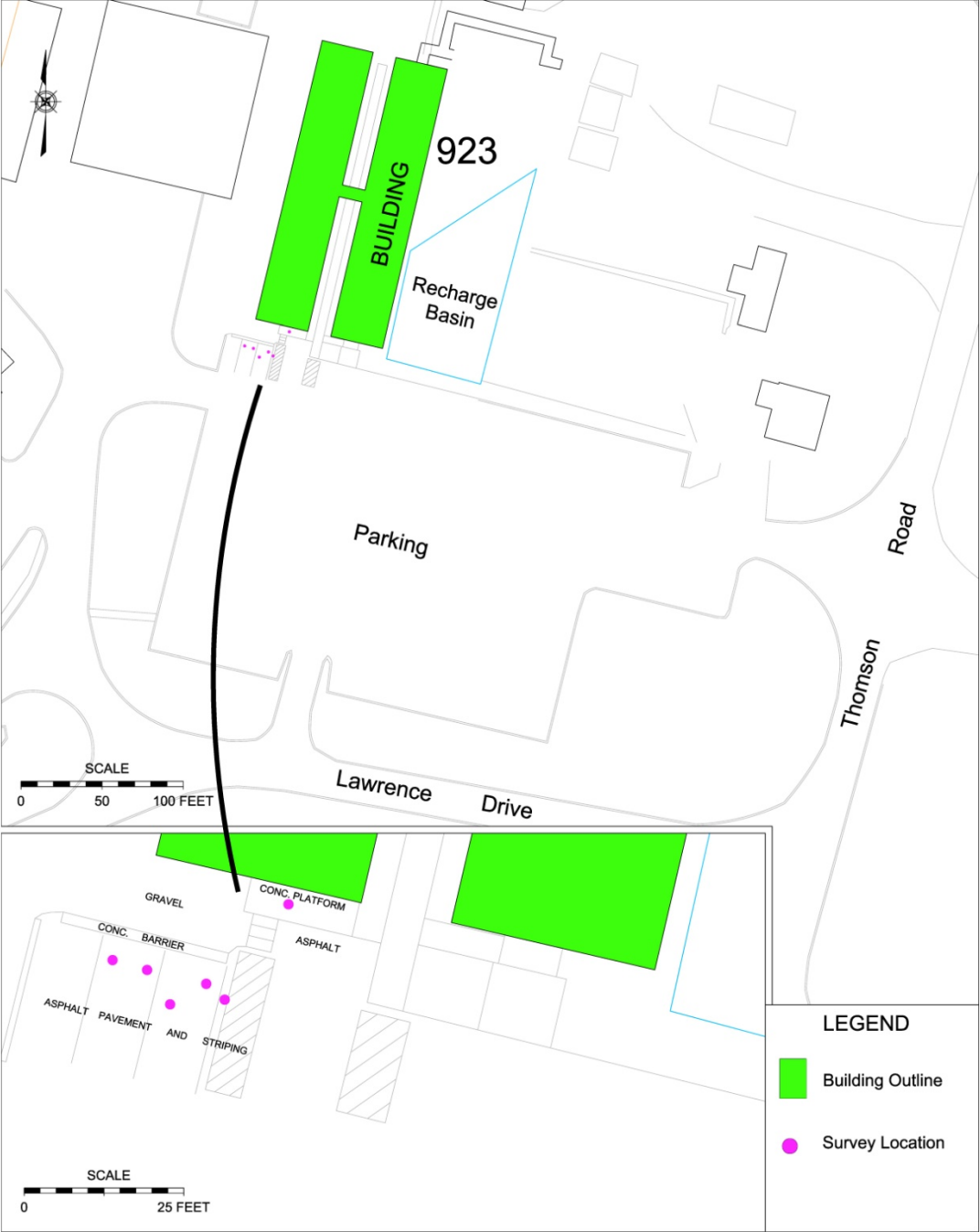
MAIN GATE

LEGEND

Building Outline

SCALE

0 1/8 1/4 3/8 1/2 MILE



Immediate Actions

- Call Radiological Control Division first responders to return to work to assist in extent of condition surveys
- Survey and decontaminate RCT 1 and RCT 2
- Isolate source and bag, secure government vehicle
- Surveys of path of travel of RCTs, parking lot and bldg. 923, several areas identified as contaminated. Areas either decontaminated or secured.
- Recalled all workers from 923 for survey (all clean)
- Recalled co-worker of RCT1 to survey car, did not reach until following morning
- Began back-tracking RCT 1, Surveyed all areas including Berkner cafeteria (clean)
- Begin surveys of radiation monitors to identify the extent of possible contamination

Overview of Survey Results

■ Personnel Contaminations

- Radiological Control Technician (RCT) #1 – Contamination found on his hands, shirt and shoes. The individual was decontaminated and clothing dispositioned
- RCT #2 – left shoe only, decontaminated

■ Pavement Outside of Building 923

- Six spots approximately 3 inches in diameter each were found. These were cleaned, painted, and scheduled for removal.

■ Laboratory Vehicle (w/ source and pig)

- Contamination on floor and other spots transferred by the RCTs feet and hands. The vehicle was decontaminated, surveyed, and released

■ Personal Vehicle (left off-site)

- Two spots of contamination on passenger side floormat and rug, each approximately 3 inches diameter. The contamination was removed and vehicle was surveyed and released.

■ Off-site

- Parking area, path of travel, and home of vehicle owner all surveyed and determined to be free of contamination

Overview of Dose

- **Internal**

- Both RCTs were whole body counted, determined no internal dose.

- **Skin dose RCT#1**

- Dose to the hand determined to be 4 mrem (extremity dose limit = 50,000 mrem)

- **External**

- TLDs were read and determined dose RCT#1 = 0, and RCT#2 = 19 mrem
- Doses within the normal range for CAD RCTs for the month

Follow-up Actions

- **Event Investigation Committee**
 - Analyze the incident and develop corrective and preventive actions to understand the cause and prevent recurrence
- **Communications Committee**
 - Analyze the timeliness and effectiveness of event communications, and develop recommendations for improvement
- **Contractor Assurance Committee**
 - Analyze our assessment procedures and processes to determine how they could be improved
- **Stand Down of Radiological Operations**
 - Rolling stand downs of operations
 - Leak-test all sources
 - Review contamination control procedures and practices