U.S. DEPARTMENT OF ENERGY | OFFICE OF ENVIRONMENTAL MANAGEMENT

Characterization Summary
Main Plant Process Building Demolition

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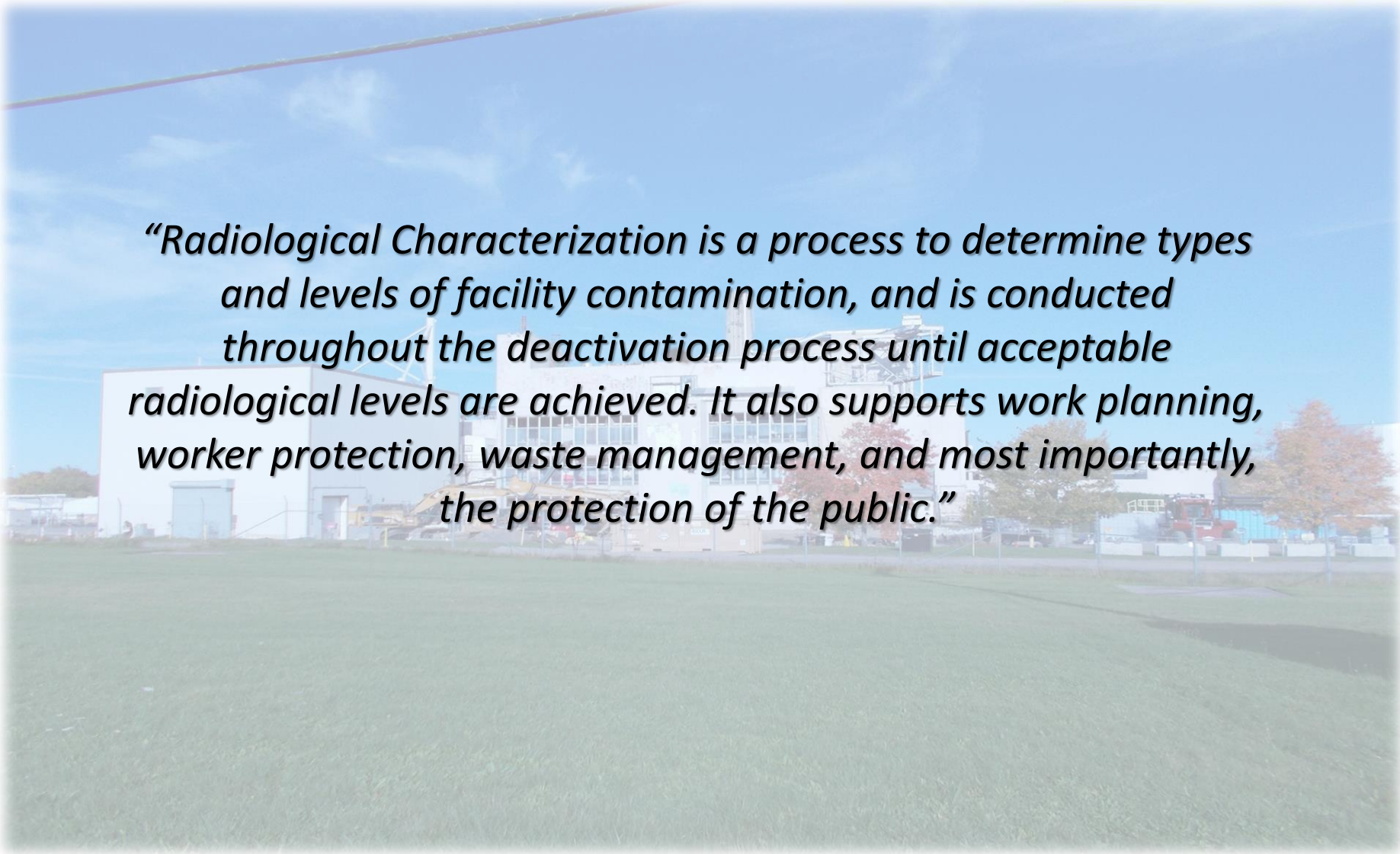
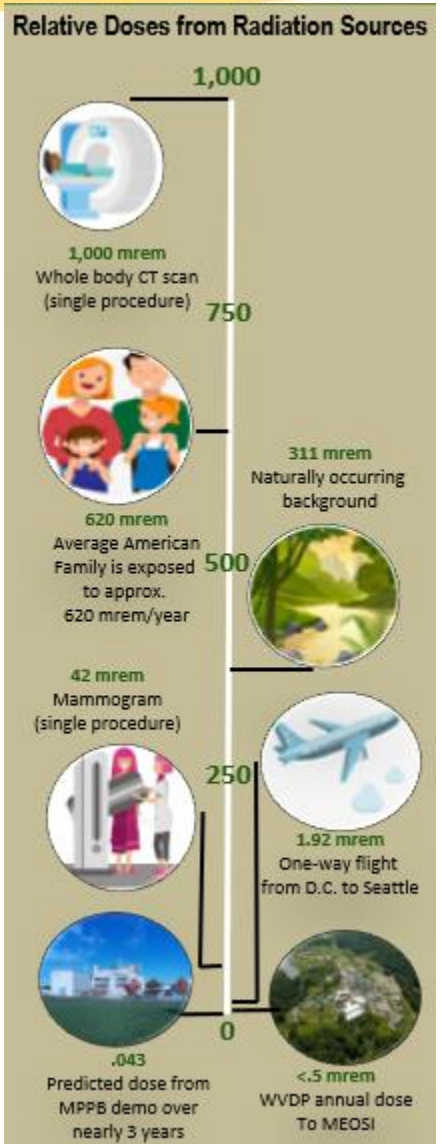
Radiological Characterization



"Radiological Characterization is a process to determine types and levels of facility contamination, and is conducted throughout the deactivation process until acceptable radiological levels are achieved. It also supports work planning, worker protection, waste management, and most importantly, the protection of the public."

Radiation Dose Concepts

- The amount of radiation absorbed by a person is measured in dose
- A millirem (mrem) is a unit of absorbed radiation dose by a human being
- Dose limits per year to the Maximally Exposed Offsite Individual (MEOSI):
  - <100 mrem/year from all pathways (air, water, food)
  - <10 mrem/year from the air-only pathway
- As described in our yearly briefings to present our Annual Site Environmental Report (ASER) data:
  - Typical WVDP annual dose to MEOSI is <0.5 mrem
- Humans receive radiation dose in our everyday life
  - According to the National Council on Radiation Protection and Measurements, the average American is exposed to 620 mrem/year, about half of which comes from natural background radiation



Characterization Guidelines

- The WVDP characterization program is based upon guidelines provided in *Title 10, Code of Federal Regulations, Part 835, Occupational Radiation Protection*
- Characterization Process Overview:
  - Laboratory samples
  - Examine facility drawings
  - Develop survey plan
  - Perform survey/sampling
    - Alpha and beta instrument surveys
    - Perform sampling
- Areas have been characterized (e.g., walls, floors, ceiling, remaining equipment)
- Data collected was used to support demolition methods, sequencing, limits, and determine potential dose to workers and the public

Radiological Control Technician (RCT) holds a hand-held detector used onsite during work activities

Characterization approach ensures radiological levels are achieved for safe and compliant open-air demolition

Characterization Process

Lab Gamma spectroscopy

Lab Alpha spectroscopy

Facility drawings help find areas that need to be surveyed

Guidelines for Performing Pre-Demolition Radiological Surveys

Develop Survey Plan

Sampling

Characterization Survey

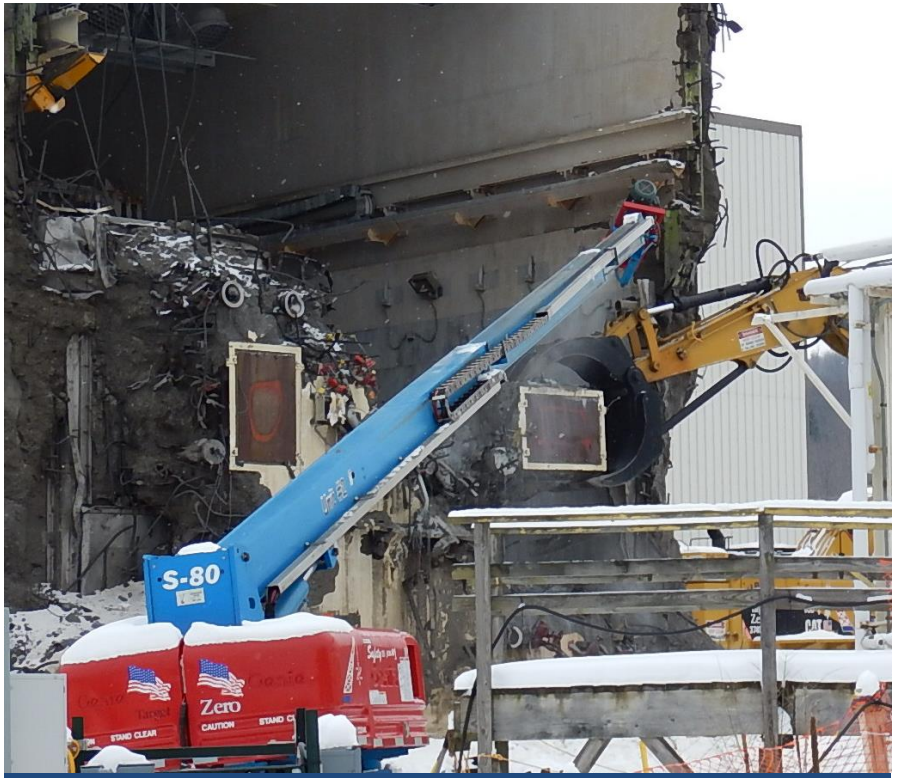
MPPB Characterization

Residual Radioactivity in the MPPB:

- Total estimates currently stand at ~40 plutonium-equivalent curies
- These estimates include the estimated contribution from the Product Purification Cell-South (PPC-S), currently undergoing aggressive decontamination
  - To date, 12% of the activity in PPC-S has been removed
  - PPC-S contains ~35% of the remaining facility activity
- ~98% of the facility radiological activity has been removed since the 1990's
- Facility deactivation and radiological material removal continues
  - Final characterization will be performed following removal activities, to include the ongoing, aggressive decontamination of the PPC-S (discussed in the November QPM)
- Radioactive materials that remain are being stabilized to minimize the potential for release
  - Foaming of penetrations
  - Applying fixatives to surface areas
  - Grouting floors that remain

Demolition Preparations

- Potential hazardous materials are being identified and plans developed to remove these materials either prior to or during demolition:
  - Hazardous materials include lead counter-weights and shielding, electrical lamps, ballasts and switches, petroleum-based oils from cranes, and zinc bromide and mineral oils from shield windows
  - Potential hazardous materials are being identified and will be removed
  - In some instances where these types of materials cannot be removed before demolition, work documents will include steps to identify/mark, remove, and segregated during demolition operations
  - Materials are managed as waste, and properly characterized and packaged for appropriate disposition



An excavator carefully removes a shield window during the demolition of the Vitrification Facility

Summary

Characterization for MPPB Demolition

- Characterization activities strictly adhere to *Title 10, Code of Federal Regulations, Part 835, Occupational Radiation Protection*
- Characterization is an ongoing process for the protection of our workers, the general public and the environment
- Characterization ensures all safety precautions are taken to enable a safe and regulatory compliant open air demolition that is protective of the workforce, public and environment
- Characterization is a collaborative effort that involves past experiences at West Valley and other DOE sites, lessons learned, and shared best practices