

# PEMA Conference

May 14-15, 2016

Radiological Instructors  
And  
Radiological Officers



**FEMA**

# New Development and Updates

- Based on
  - PPD#8 –National Preparedness Goals (37 Core Capabilities and the Response Mission),
  - NFPA 472/473, 1600, etc., (new in Aug 2016)
  - OSHA 1910.120,
  - Joint Commission,
  - REP Program Manual (2015)
  - Etal.



# Needs for Rad Program

- Prepare and build Core Capabilities (Review NPD Goals)
- Identify Capability Gaps
  - Policies, Plans, SOPs/SOGs
  - Equipment and other resources (people, money, facilities, etc.)
- Possible Solutions
  - Partnerships (other federal agencies and private sector)
  - Motivational actions (ever-changing threat environment)
  - Training and Exercises
    - Just-in-time training/refresher activities
  - Use of Social Media
    - Mobile-device training



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# Future Rad Direction

- Focus group – September 2016
  - Build a Radiological Training Track – Progressive Learning Program
  - Partners:
    - State, Tribal, Local Responders
    - FEMA partners (REPP – NPD and CBRNE – OR&R)
    - Federal Agencies
      - DOE (TEPP, Los Alamos, Lawrence Livermore, etc.)
      - DHS/DNDO
      - EPA
    - NDPC – CTOS/NV



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# New Activities (2016-2017)

- Rad Integrated Capstone Events (RICE)
  - RERO/ARIO/ **include RAAC**
- Rad Nuke Surge (CBRNE) – all hazards – RDD, RED, IND, HAB, etc.
  - working with DHS's Domestic Nuclear Detection Office (DNDO) and DOE
- **Spectroscopic Alarm Adjudication**
  - DOE, Los Alamos
- Expand Rad Series TtT –
  - **Working with REP to add other REP courses** beyond FCRR, HRA, and MERRTT (DOE)
- **MERRTT (IS 302)**
  - Working with DOE to convert/update to interactive on-line training
- **Decon Specialists for Mass Casualties Incidents**
  - Congregate Care, Reception Centers, Animals, Disabled populations, mass casualty incidents, etc.
- **Update all radiological IS courses**



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# Advanced Course

## Advanced HazMat (two week “Ranger” program)

- More applied CBRNE Scenarios;
  - more on Radiological Hazards
  - hit the ground in operational mode (first day)
  - little classroom activities – refresher training
  - more experiential-based learning
- Partnerships with:
  - NFA (Chemistry)
  - ECBC, LSU, and Jacksonville State Univ (Bio)
  - CTOS-NV/DOE/DHS DNDO (Rad/Nuke)
  - DOE and DOT/AAR (Transportation – Rail and ground)
  - NMT (Explosives)



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# New Indirect Course Numbers

- FCRR (old G320)
  - PER 909-2
- Hospital Radiation Accident (HRA) – (G346 old)
  - PER 910-2



# Course Numbers

- REP Core Concepts- RCCC – AWR 317
- REP Disaster Initiated Review (RDIR) - AWR 318
- REP Exercise Controller - RECC – AWR 327 – new as of 09/15
- REP Exercise Evaluation – REEC - PER 314
- Radiological Emergency Response Operations (RERO) – PER 904
- Advanced Radiological Incident Operations (ARIO) – PER 905
- Radiological Series TTT – PER 908-1
- Rad Accident Assessment Course (RAAC) - PER 916
- REP Plan Review (RPPR) - MGT 445
- REP Post Plume Plan Review (RPPP) – MGT 453 (new course – August/Sept 2016)



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# Leverage Technology

- Introduction of new technology
  - “Beta test” equipment for DHS S&T
  - Chem, Bio, and Rad detection and sampling
  - RadResponder
- iPads and laptops
  - Limited to: no printed materials
  - Download from website (with FEMA SID)
  - Simulation-based activities
  - Evaluation and tests



# PA Statistics for 2015-2016

- Resident and Nonresident courses:
  - RERO/ARIO
  - Rad Series TTT (supports indirect training – FCRR and HRA)
  - REP Disaster Initiated Review
  - REP Exercise Evaluator
  - Rad Accident Assessment
  - REP Core Concepts
  - REP Plan Review
- 20 people trained from EM, EMS, HazMat, and PH
  - Jurisdictions: Bucks, Chester, Cumberland, Dauphin, Lancaster, Lebanon, Montgomery, Philly, and York



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# Questions



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# Department of Energy Transportation Emergency Preparedness Program

## PEMA Emergency Management Conference

### Rad Instructor Update May 14 – 15, 2016

Mark Linsley – Regional DOE TEPP Contractor Coordinator

Ellen Edge – DOE TEPP Program Manager



# TEPP Update

- Presentation Topics
  - PA Training Activities
  - MERRTT Revisions
  - RODEO / FSE
  - Future Training Plans
  - Agency Cooperation
  - Website Resources





# PA 2-Year Training Activities

- Total Trained: 577
  - Philadelphia: 312
  - Everyone Else: 265
    - Full MERRTT: 89
    - CMERRTT: 144
    - T-t-T: 3
    - Partial: 1
    - Rad Specialist: 31
    - TMERRTT: 0



# MERRTT Revisions

- 2016 Emergency Response Guidebook
- Possible addition of a Level C (Tyvek<sup>®</sup> / Coveralls) dress down procedure and video
- Enhancement of Rail Module to include more information on Navy and Spent Nuclear Fuel casks
- Update of pictures, numbers, organizational names as needed
- CSG ad hoc committee reviewing and approving changes – final decisions at the NTSF meeting the week of June 6



# MERRTT Revisions

- Videos have been reshot; final stages of editing
  - [Emergency Response Practices](#)
  - Decontamination Practices
  - [Pre-Hospital Practices](#)





# TEPP Sponsored Exercises

- With Pennsylvania Emergency Management Agency
  - 3/18/15 – Harrisburg, PA: Radiopharmaceutical and Spent Nuclear Fuel Tabletop Exercise
  - 8/1-2/15 – Lancaster, PA: Radiological Officers' Development in Emergency Operations (RODEO) Workshop and Full-Scale-Exercise
  - 138 total participants for both





# Improvement Plan

## OBSERVATION

- Better understand first responder and first receiver training and capabilities

## RECOMMENDATION

- Conduct a "Needs Assessment" in affected counties

## CORRECTIVE ACTION

- Recommend and encourage counties to utilize the DOE TEPP "Needs Assessment" tool to evaluate response capabilities and shortcoming in counties affected by DOE shipments of radioactive material



# Improvement Plan

## OBSERVATION

- Responders lacked a firm understanding of the need to perform contamination surveys and impact of results obtained

## RECOMMENDATION

- Training

## CORRECTIVE ACTION

- Instructors should be informed of the need to emphasize contamination assessment; reinforced during refresher training, workshops, and exercises



# Contamination Example

- Accident involving a 10 mCi Cs-137 source
- 1000 cpm of contamination detected
- ~ 10,000 dpm of actual contamination
- How many radioactive atoms are we potentially worried about?

**508,489,558,441,558,441**



# Improvement Plan

## OBSERVATION

- Response personnel lack a solid and complete understanding of instrumentation use, limitations, and Command position responsibilities

## RECOMMENDATION

- Advanced level training

## CORRECTIVE ACTION

- Schedule and complete multiple Technician Level MERRTT programs within the Commonwealth



# Improvement Plan

- TMERRTT
  - 8-hour program
  - Advanced level training on instrument operation, radiological detector selection and limitations
  - Three field drills incorporating incident command and determining response objectives
  - How to conduct radiation and contamination surveys and establish radiological control zones
  - Demonstrate decontamination methods and contamination controls



# Improvement Plan

## OBSERVATION

- Documentation of radiological incident information could be simplified using fill-able PDF formatted files

## RECOMMENDATION

- Create fill-able PDF forms specifically needed for a radiological response

## CORRECTIVE ACTION

- Evaluate the possibility, and develop if suitable



# Improvement Plan

## OBSERVATION

- Multiple requests were made for continued radiological training, workshops, and exercises

## RECOMMENDATION

- Continue an enhanced radiological response focus in PEMA training and exercise efforts

## CORRECTIVE ACTION

- Maintain the effort to include radiological response training as part of annual PEMA conferences, offer workshops, TTX, and FSE at multiple locations within the Commonwealth



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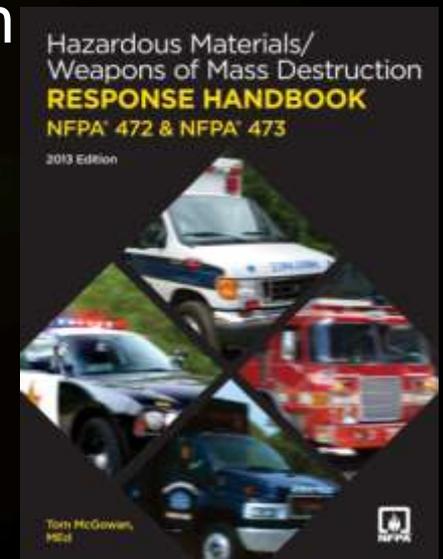
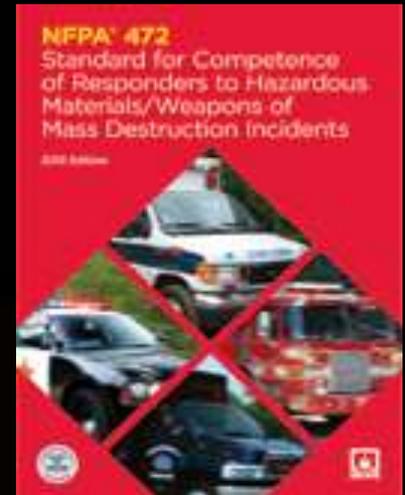
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- May 31 – June 1: Clearfield, PA
  - One MERRTT class
  - Clearfield County Dept. of Emergency Management
- June 2 – 5: Conshohocken, PA
  - Two back to back MERRTT classes
  - Montgomery County Fire Academy
- Radiation Specialist:
- [www.trgroupinc.com/specialist](http://www.trgroupinc.com/specialist)
  - Louisville, KY: May 23 – 27 (waiting list)
  - Boulder, CO: August 1 – 5
  - Charlotte, NC: August 29 – Sept. 2



# Agency Cooperation

- National Fire Protection Association
- Standards 472 and 473
  - Under scheduled revision
  - Open for 2<sup>nd</sup> round of public comment until May 16, 2016
  - Revised standards will then be re-issued in either May or August of 2017





# New NFPA Standards Under Development

- 475: Recommended Practice for Responding to Hazardous Materials Incidents/Weapons of Mass Destruction
- 1072: Standard for Hazardous Materials/Weapons of Mass Destruction Emergency Response Personnel Professional Qualifications
  - Final public comment period closed on Nov. 16, 2015
  - Final Consent Standards to be submitted in Nov. 2016
  - Standards to be issued in Aug. 2017



# Website Resources

- The TEPP web site provides one-stop for information
  - ✓ MERRTT Training Schedule
  - ✓ 24-Hour Points of Contact
  - ✓ Needs Assessment
  - ✓ Model Procedures
  - ✓ Exercise Planning Resources
  - ✓ TEPP Regional Coordinators

<http://www.em.doe.gov/otem>



# Questions



# ?



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# Exercise Findings - Training

- Responders lacked a firm understanding of the need to perform contamination surveys and impact of results obtained
- Response personnel lack a solid and complete understanding of instrumentation use, limitations, and Command
  - TMERRTT



# Exercise Findings - Training

- TMERRTT
  - 8-hour program
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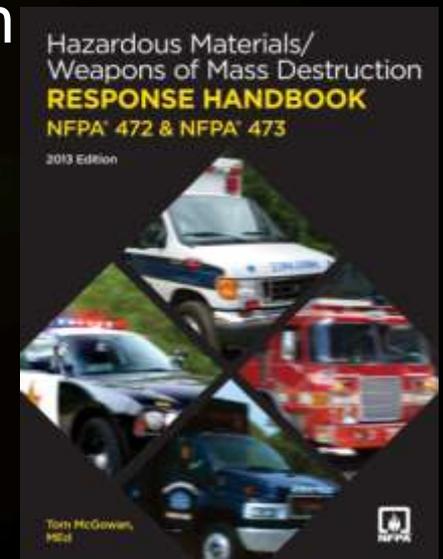
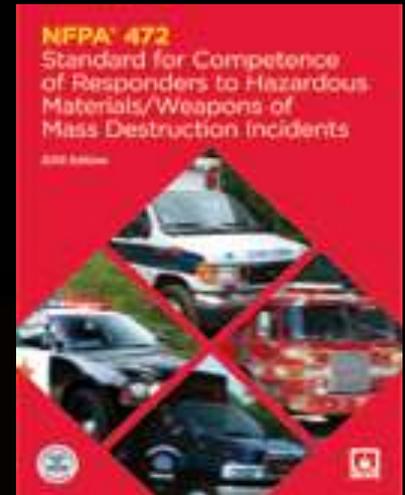
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# Questions



# ?



**pennsylvania**

DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Radiation Protection

# **PSC Metals Radium Event**

**Dwight Shearer, PE**

**PEMA EM Conference**

**2016**

Tom Wolf, Governor

John Quigley , Secretary

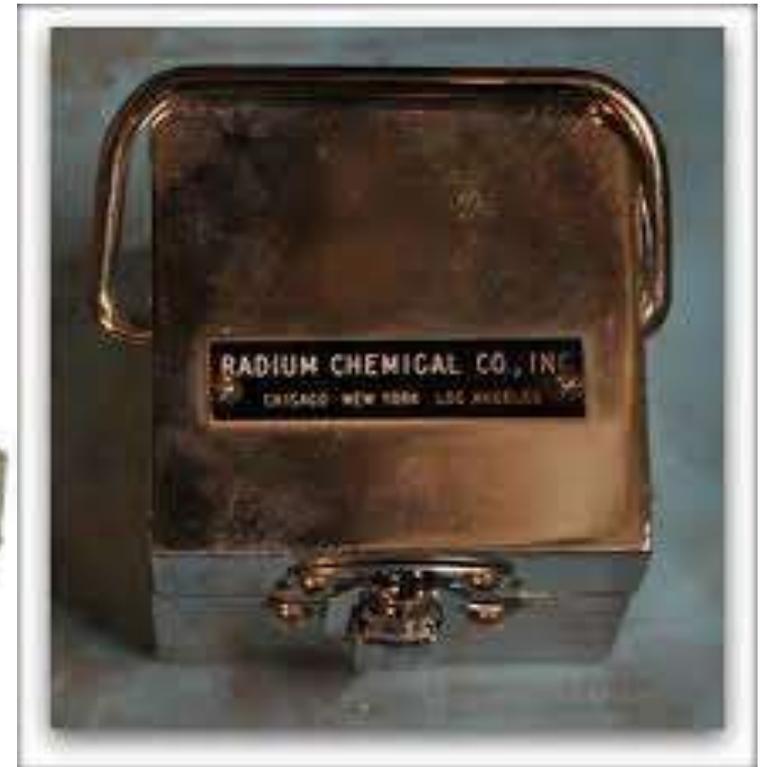
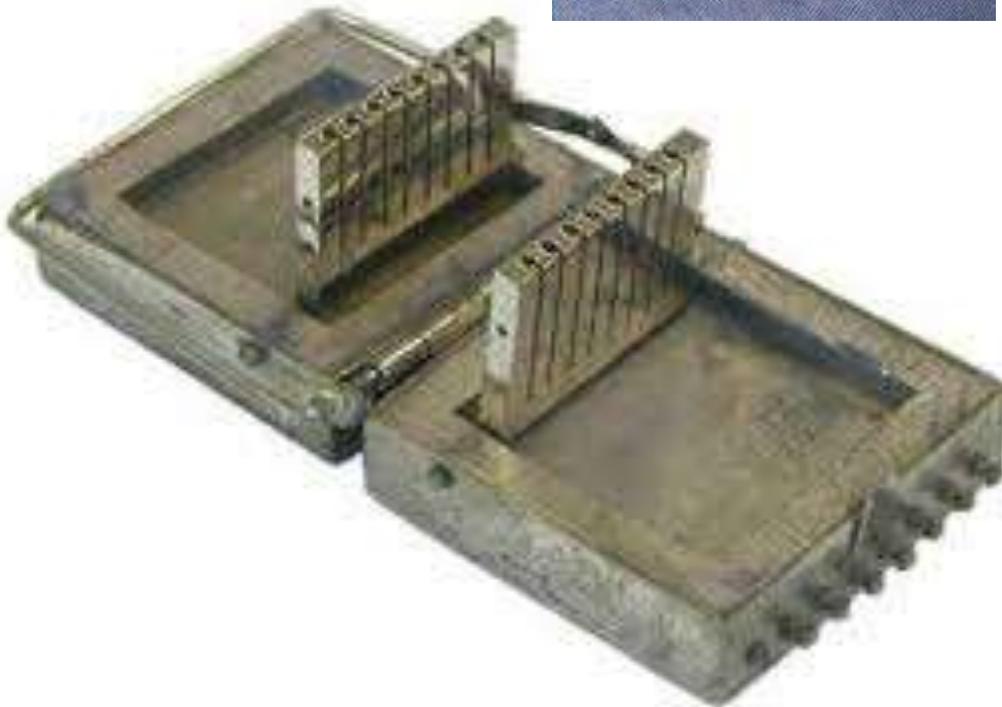
# PSC Metals Radium Event



# PSC Metals Radium Event



# PSC Metals Radium Event



# PSC Metals Radium Event

- Shredding Process
  - Frag – heavier metals
  - Fluff – plastics, vinyl, etc.

# PSC Metals Radium Event



# PSC Metals Radium Event



# PSC Metals Radium Event

10 Loads of material left Beaver Falls, PA

5 loads of frag destined for Mansfield, OH

5 loads of fluff destined for Massillon, OH

# PSC Metals Radium Event



# PSC Metals Radium Event



# PSC Metals Radium Event

The inbound alarms are triggered at both Ohio facilities

# PSC Metals Radium Event

The 5 loads at Mansfield

Routed to PSC - Canton facility  
Dumped under canopy

# PSC Metals Radium Event

The 5 loads at Massillon

1<sup>st</sup> Truck - alarmed twice –

# PSC Metals Radium Event

Processed the first truck

2nd truck – alarmed – told to dump

Trucks 3, 4 and 5 also dumped

# PSC Metals Radium Event

Employee at Massillon finds and handles a piece of radium contaminated material

Spreads contamination throughout the offices, home, etc.

# PSC Metals Radium Event

The Ohio cleanup is proceeding –  
weeks away from completion

The Pennsylvania cleanup will  
startup once Ohio is finished



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Bureau of Radiation Protection

# Questions?



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DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Radiation Protection

**Dwight Shearer, PE**  
**PA DEP Bureau of Radiation Protection**  
**400 Waterfront Drive**  
**Pittsburgh, PA 15222**

**Tel: 412-442-4000**  
**[dwshearer@pa.gov](mailto:dwshearer@pa.gov)**



**pennsylvania**

DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Radiation Protection

# Bureau of Radiation Protection - Update

**Dwight Shearer, PE**

**PEMA EM Conference**

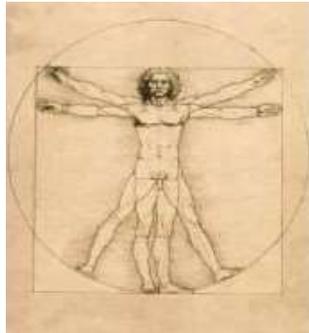
**2016**

# Nuclear Power Plants

- Limerick
- TMI
- Peach Bottom
- Beaver Valley
- Susquehanna

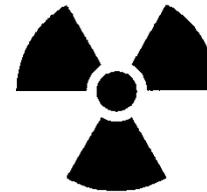


# Radon

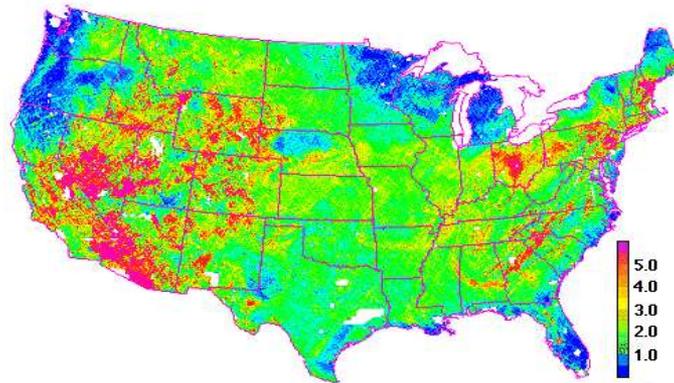
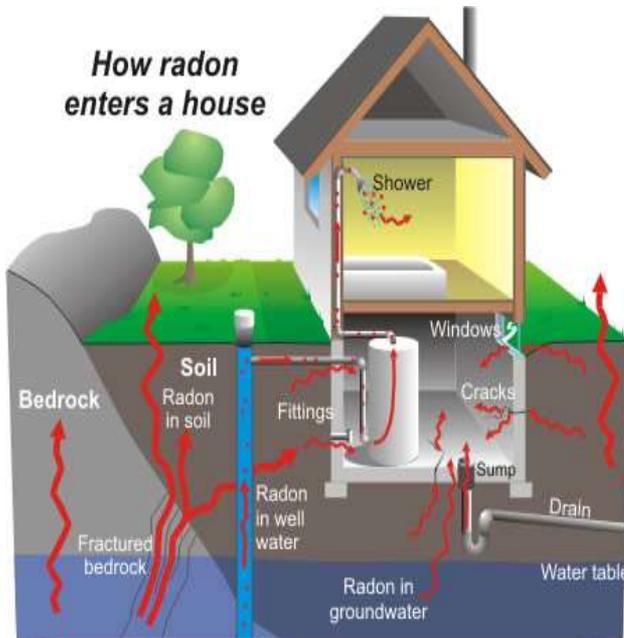


## Natural Source

Radon in homes >  
200 mrem/yr



EPA Action  
Level  
< 4 pCi/L



Uranium Concentrations

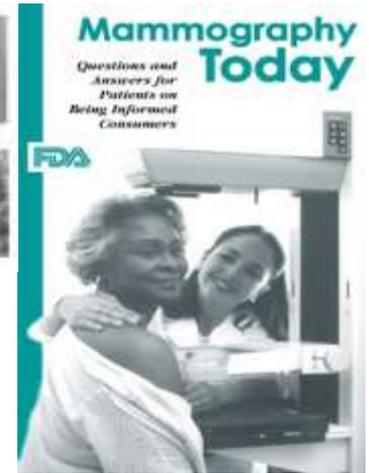
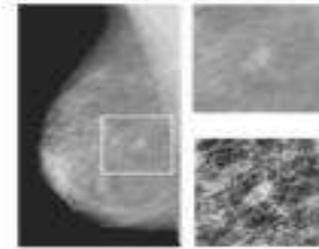
ppm eU  
(approximate scale)

## URANIUM 238 (U238) RADIOACTIVE DECAY

| type of radiation | nuclide           | half-life          |
|-------------------|-------------------|--------------------|
| α                 | uranium-238       | 4.47 billion years |
| β                 | thorium-234       | 24.1 days          |
| β                 | protactinium-234m | 1.17 minutes       |
| α                 | uranium-234       | 245000 years       |
| α                 | thorium-230       | 8000 years         |
| α                 | radium-226        | 1600 years         |
| α                 | radon-222         | 3.823 days         |
| α                 | polonium-218      | 3.05 minutes       |
| β                 | lead-214          | 26.8 minutes       |
| β                 | bismuth-214       | 19.7 minutes       |
| α                 | polonium-214      | 0.000164 seconds   |
| β                 | lead-210          | 22.3 years         |
| β                 | bismuth-210       | 5.01 days          |
| α                 | polonium-210      | 138.4 days         |
| α                 | lead-206          | stable             |

# Radiation Control

## X-ray & Accelerators



# Radiation Control

## Radioactive Materials



***Agreement State - March 31, 2008***

**(Three PA IMPEP reviews... “satisfactory & compatible.”)**

# Decommissioning and Environmental Surveillance

SLDA >



U.S. Radium / SLC >



# BRP – Program Overview

- **BRP has four main offices**
  - **Central Office – RCSOB**
  - **SERO – Norristown**
  - **SCRO – Harrisburg**
  - **SWRO – Pittsburgh**
- **With staff being located throughout the state**

# BRP – Program Overview

- **BRP has a compliment capacity of ~105**
- **We are running at ~90% capacity**
- **Within the next 4 years we could have as many as 15 staff members eligible for retirement.**

# BRP – Program Overview

The screenshot displays the PA.GOV website interface. At the top, a blue navigation bar contains the PA.GOV logo and menu items: ABOUT US, JOB SEEKERS, VETERANS, and HEARINGS AND APPEALS. Below this is a large banner image of the Pennsylvania State Capitol dome at night with fireworks. A search bar with the placeholder text "Enter Search Term" is positioned on the right side of the banner. The Pennsylvania State Civil Service Commission logo is on the left, with the names "TOM WOLF, GOVERNOR" and "ODELFA BARTH-FRESTON, CHAIRMAN" listed below it. On the far right of the banner, a vertical menu lists "ONLINE SERVICES", "HR", "PROFESSIONAL", and "WALK-IN TESTING".

Below the banner, three blue boxes contain announcements:

- LOCALIZED EXAMS:** 1) MEAL TRANSPORTER (LEBANON COUNTY); 2) EMERGENCY MEDICAL SERVICES PROGRAM SPECIALIST (DAUPHIN COUNTY). Includes a "More Details" link.
- OFFICE OF VOCATIONAL REHABILITATION EMPLOYMENT NEEDS - INTERNSHIP AND PERMANENT POSITIONS ARE AVAILABLE NOW!** Includes a "More Details" link.
- DISABILITY CLAIMS ADJUDICATOR TRAINEE - OPPORTUNITIES AND TESTING INFORMATION** Includes a "More Details" link.

At the bottom, three white boxes represent "JOB SEEKERS", "VETERANS", and "ONLINE SERVICES", each with a representative image. The footer includes "Contact Us", "Sitemap", and "Right-To-Know" links, along with a mobile navigation bar with icons for Menu, Agencies, Privacy Policy, Settings, Share, and Tech Help.

# BRP – Program Overview

**[www.scsc.pa.gov](http://www.scsc.pa.gov)**

## **Under Engineering and Environmental Control**

**[2016051](#) Radiation Health Physicist Trainee 12/2016**

**[2015131](#) Radiation Health Physicists and 11/2016  
Radiation Protection Program  
Supervisor**

# BRP – Program Overview

- **Regulations Update**
  - **Part 37 – matching with the NRC  
effective April 1<sup>st</sup> 2016**
  - **Title 25 – Cleanup  
comment period**
  - **Fees – Title 25 Chapt218.1 (i)  
comment period**

# BRP – Program Overview

- **There are four basic funding streams**
  - **Nuclear Power**
  - **Radon**
  - **X-Ray and Accelerators**
  - **Radioactive Materials (RAM)**

**Our report/review showed a need to adjust the Radon and RAM fees.**

# BRP – Program Overview

- **Nuclear - 5 power plants**
- **Radon ~ 500 registered Firms or Individuals to perform radon activities**
- **Decommissioning and Env. Surveillance ~ 15 active cleanup sites**

# BRP – Program Overview

- **Radiation Control**
  - **X-Ray ~ 12,000 registrants**
  - **Accelerators ~ 150 licensees**
  - **MQSA ~ 350 facilities**
  - **Radioactive Materials ~ 1000 licensees**

# BRP – Major Events

- **Papal Visit**
- **Democratic National Convention**



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# Questions?



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  - Chem, Bio, and Rad detection and sampling
  - RadResponder
- iPads and laptops
  - Limited to: no printed materials
  - Download from website (with FEMA SID)
  - Simulation-based activities
  - Evaluation and tests



# PA Statistics for 2015-2016

- Resident and Nonresident courses:
  - RERO/ARIO
  - Rad Series TTT (supports indirect training – FCRR and HRA)
  - REP Disaster Initiated Review
  - REP Exercise Evaluator
  - Rad Accident Assessment
  - REP Core Concepts
  - REP Plan Review
- 20 people trained from EM, EMS, HazMat, and PH
  - Jurisdictions: Bucks, Chester, Cumberland, Dauphin, Lancaster, Lebanon, Montgomery, Philly, and York

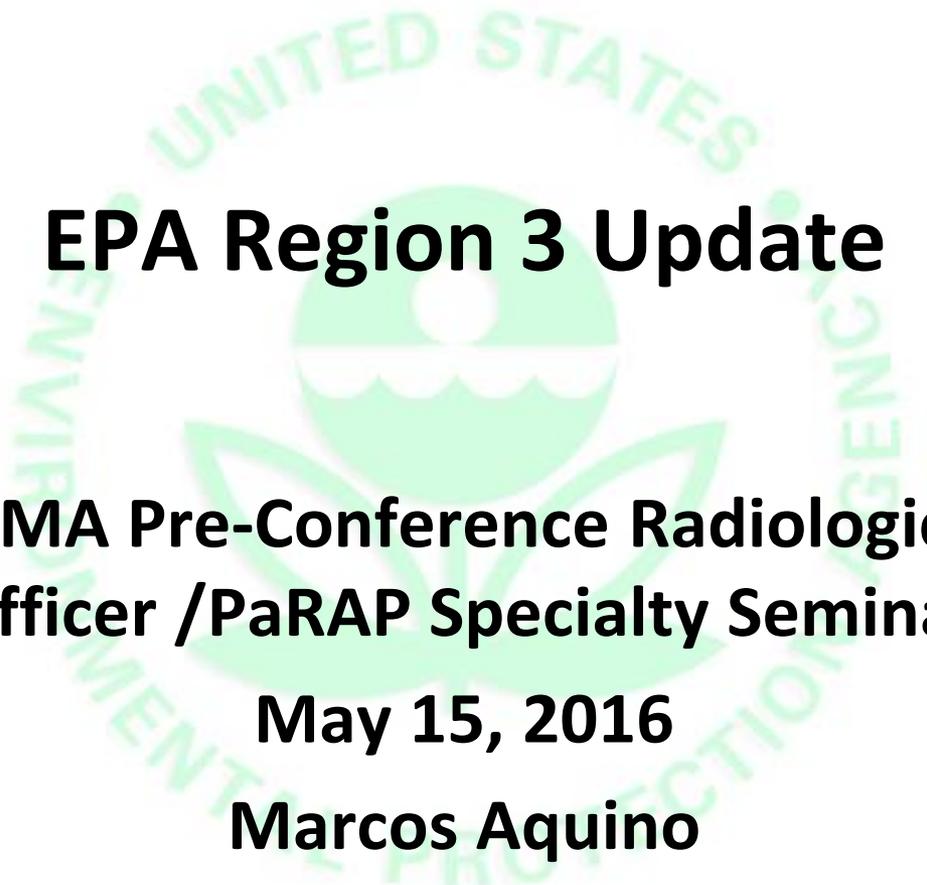


**FEMA**

# Questions



**FEMA**



# **EPA Region 3 Update**

**PEMA Pre-Conference Radiological  
Officer /PaRAP Specialty Seminar**

**May 15, 2016**

**Marcos Aquino**



# What's new in the Radiation Program?

- HQ's and all regions
  - RERT Commanders,
  - retirements,
  - strategy for maintaining readiness



# Radiological Emergency Response Team (RERT)

---

- EPA's radiological response assets include:
  - Trained responders
  - Team commanders and specialists
  - Equipment and mobile laboratory capabilities
- RERT expertise includes:
  - Radiation monitoring
  - Radionuclide analysis
  - Radiation health physics
  - Risk assessment





## Radiological Emergency Response Team (RERT)

- Provide guidance & on-scene assistance at Superfund and ER sites to OSCs and in the FRMAC
- Field-Deployable RERT:
  - Focus is on identifying and assessing potential impacts of low-level contamination
  - Field monitoring instruments and sample collection equipment
  - Mobile laboratories and capabilities
- Fixed laboratory capable of providing comprehensive environmental analytical services





# EPA RERT Experience

- Large-scale Incidents
  - Three Mile Island
  - Chernobyl
  - DOE Site Fires
- Small-scale Incidents
  - Lost Sources
  - Removal Sites
  - DOE Site Investigations





# Gregg Dempsey

## In Memoriam: Gregg Dempsey

*Edward Wilds, Jr., PhD*



Gregg Dennis Dempsey, 60, of Las Vegas, Nevada, 31 December 2015. Gregg was born in Canton, Ohio, Cleveland, Mississippi. A graduate of Cleveland High School, an Eagle Scout, was a member of the Order of the Arrow throughout his inspiring life. Gregg was also a member of the Health Physics Society (HPS) and was a Conference of Radiation Control Program Administrators (CRCPA) member.

Gregg graduated from the University of Mississippi in 1978 and served for just over eight years at the Mississippi State University Radiological Health in Jackson, Mississippi, eventually becoming the Environmental Monitoring and Emergency Response Coordinator for the state of Mississippi. Gregg accepted a position with the U.S. Environmental Protection Agency (EPA) as a staff scientist with the Field Studies Branch in the Office of Research and Development in Las Vegas, Nevada. Gregg spent the majority of his career at the EPA in Las Vegas, receiving numerous awards and recognition for his work.



## RERT Commanders

- Special Teams in NCP
- EPA Representative in the FRMAC
- Gregg Dempsey, NCRFO
- Christopher Royce, NAREL
- Jeremy Johnson, NCRFO
- Sam Poppell, NAREL



## Regional radiation support, retirements

- Three regions out of ten with vacancies
- Other impending retirements in two other regions
- Looking at national regional approach to maintain readiness to respond to radiation incidents
  - Centers of excellence
  - Work sharing
  - Developing In-house capacity



# What's new in the Radiation Program?

- Region 3 in PA
  - FEMA REP
  - FEMA IND Planning
  - Vibrant Response
  - Willow Grove NAS
  - Safety Light



## Cristina Schulingkamp

- Former US NRC Inspector
- Former Radon Program Manager
- EPA FEMA REP Evaluator
  - Limerick
  - Salem HC
  - SSES



# FEMA IND Scenario Response Planning

- Bill Steuteville
  - Liberty RadEx Principal Planner
  - EPA R3 Homeland Security Coordinator
  - EPA Region 3 Planner VR IND 2016
  - Philadelphia IND Planning



## EPA Participation in VR IND 2016

- Planning Team
- Players in Hbg, FEMA RRCC, NRCC (notional), EPA R3
- A-Team, ESF-10 desk, Radiation Branch



## Early Phase

- Beginning of the incident
- Immediate decisions based on plant conditions and minimal data
- Protective Actions
  - Evacuation -- 1 to 5 rem
  - Sheltering – no minimum
  - Stable iodine (KI) administration – 5 rem child thyroid
  - Access control



## EPA Response Assets

- Radiological Emergency Response Team (RERT)  
[www.epa.gov/radiation/rert/](http://www.epa.gov/radiation/rert/)
- Consequence Management Advisory Division (CMAD)
- Environmental Response Team (ERT)
- Mobile laboratories and sample prep vehicles
- On-Scene Coordinators (OSCs)
- Nationwide radiation monitoring system - RadNet



# US EPA ASPECT

- **Rapid Response —**  
**Wheels-up within one hour**
- **Direct Integration into the Local Incident Command**
- **Standoff Chemical and Radiological Detection**
- **Real Time Collection and Airborne Processing of Data**
- **Aerial Photography/Situational Awareness Capability**
- **Real-Time Data Distribution using Satellite Communication**

ASPECT--Airborne Spectral Photometric Environmental Collection Technology





## EPA's RadNet Program

- Background
  - national network of monitoring stations, since 1978 (formerly known as ERAMS)
  - regularly collect air, precipitation, milk and drinking water
  - tracks ambient radiation levels in the environment
- <http://www.epa.gov/radnet/>

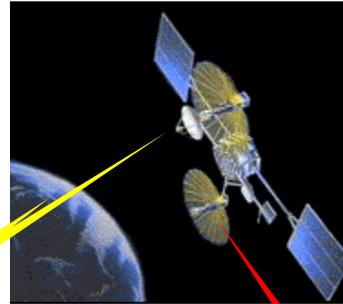


- **RadNet** consists of
  - Up to 180 new *Fixed Air Monitors* to provide national coverage and data during routine conditions
  - 40 mobile monitors (*Deployable Air Monitors*) to improve system coverage around an incident
  
- The **RadNet** program includes
  - Near real-time gamma spectrometry
  - Telemetry to send data automatically
  - Improved field screening instruments for operators to quickly monitor gross alpha and beta radiation
  - Increased number of monitors to improve coverage





# Fixed Air Monitors





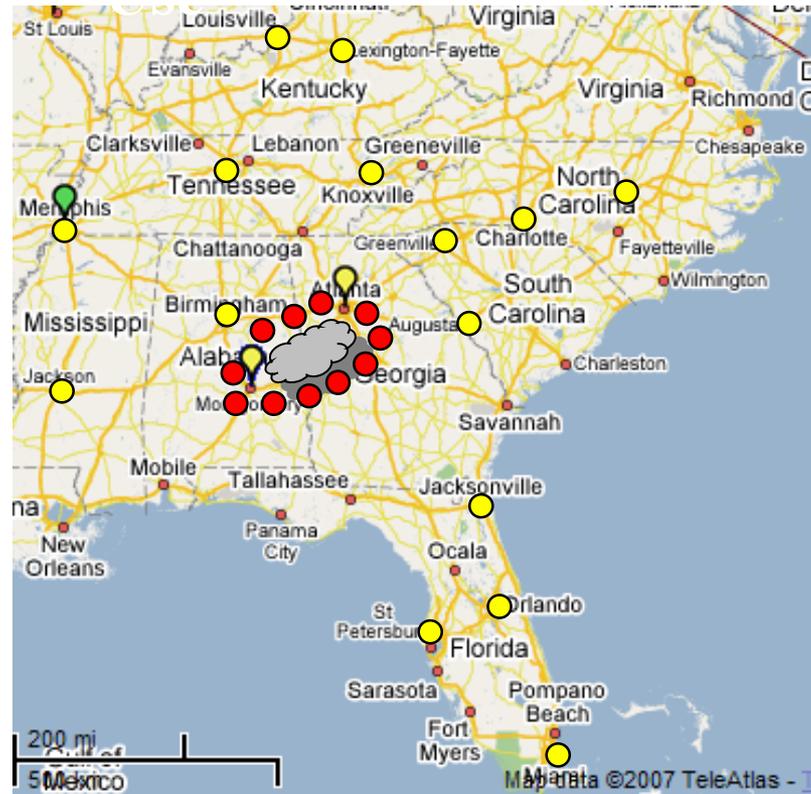
- A *deployable air monitor* is a unit that can be delivered to an incident, where it measures environmental **gamma** radiation levels in near real-time, and also collects airborne radioactivity samples for laboratory analysis.
- 40 deployable air monitors are maintained, ready to deploy, at the Montgomery, Alabama and Las Vegas, Nevada laboratories.





## Siting Scenario #2

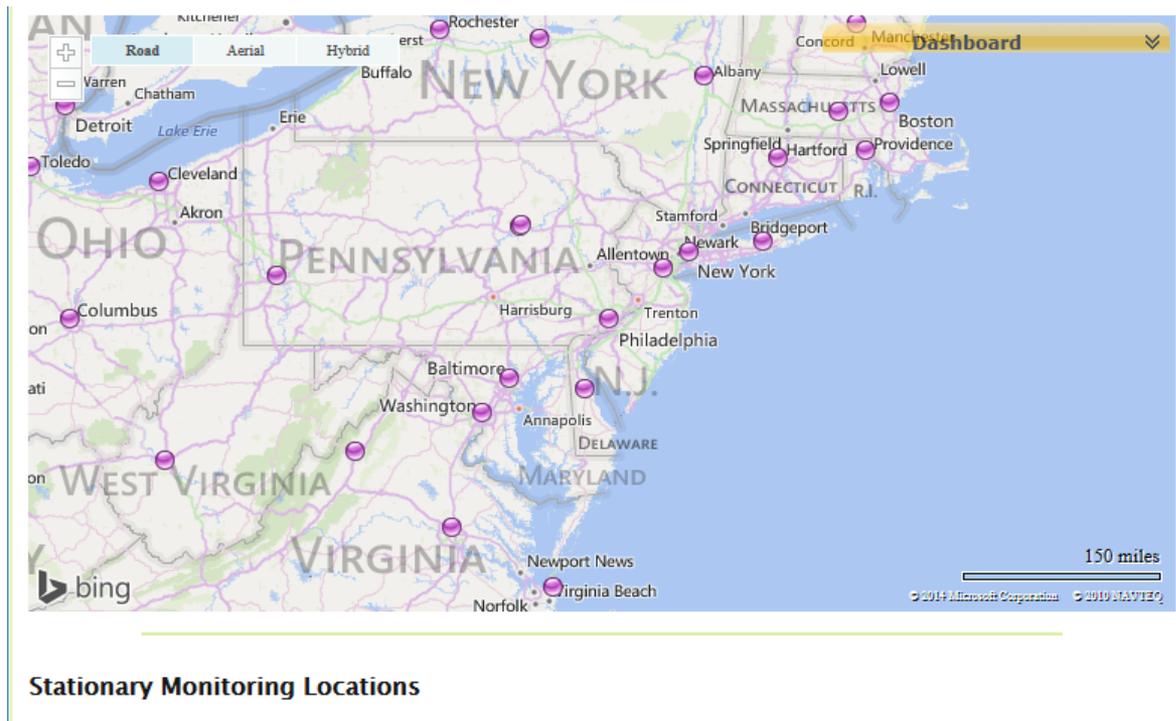
fixed  
deployables





## Region 3 RadNet and beyond

- Philadelphia
- Bloomsburg
- Pittsburgh
- Dover
- Baltimore
- Washington
- Charleston
- Harrisonburg
- Richmond
- Virginia Beach





# Willow Grove NAS

*Naval Air Station Joint Reserve Base Willow Grove  
Willow Grove, Pennsylvania*

**FINAL  
HISTORICAL  
RADIOLOGICAL ASSESSMENT**

**History of the Use of General Radioactive Materials  
1942 to 2011**





## Willow Grove NAS

- Radiological Review and approval of ten buildings
  - 3 hangars, 7 maintenance buildings
  - Radium, Strontium, Tritium, DU, others
- Per Federal Facilities Agreement with US Navy
- No future use for buildings



# **SAFETY LIGHT SITE, UPDATE**



COMPRESSOR OLAST

EAST LAGOON

DISCHARGE PIPES

WEST DUMP

WEST LAGOON

OUTFALL PIPES

DRAINAGE DITCH

WOODS AND BRUSHY AREA

TOP OF RIVER BANK

SUSQUEHANNA RIVER

FORMER WANCEMALTON PROPERTY

LANDSCAPED AND MOWED AREA

MOWED AREA

|    |  |
|----|--|
| 2  | Machine Shop                                     |
| 4  | Multi-Metals Waste Treatment Plant               |
| 5  | Carpenter Shop (Adjacent to Multi-Metals Waste T |
| 9  | Utility Building (SR-90 Source Vault)            |
| 10 | 8' x 8' Building                                 |
| 11 | Liquid Waste Building                            |
| 13 | Solid Waste Building                             |
| 14 | Metal Silo (Above-Ground)                        |
| 16 | Main Building                                    |
| 17 | Cesium Ion Exchange Hut (Attached to Main Buildi |
| 20 | Nuclear Building (Tritium Building)              |
| 21 | Butler Building                                  |



## Operable Units

- OU-1 – Safety Light Structures
  - ROD 2010
  - RA Report – 11/23/15
- OU-2 – Ground Water
  - RI/FS in progress
- OU-3 – Soils, Sediment, & Surface Water
  - RI/FS in progress
  - Early – Interim Remedy Lagoons/Dump Areas



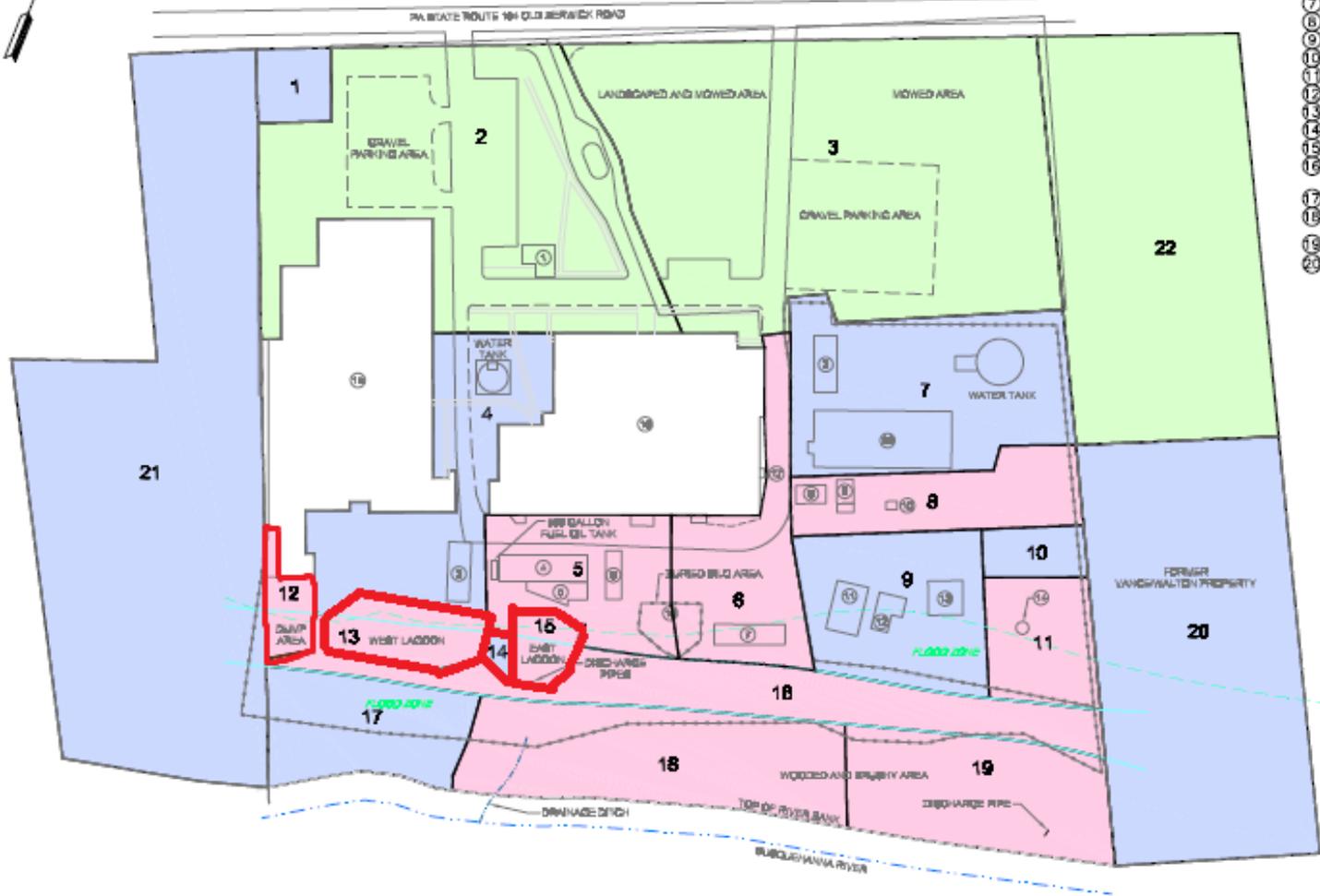
# Past Actions

- Removal Actions
  - Underground silos
  - 7 buildings – demolished
  - Off-site disposal of waste/demolition debris
  - West Dump – soil/debris consolidated and covered
- Remedial Action – 2010 ROD
  - Demolition/off-site disposal remaining structures
  - RA Report - 11/23/15
    - Some building contents awaiting disposal



## OU-3 Soils

- Remedial Investigation
  - 22 Survey Units
  - Elevated radiological activity surface/subsurface soils (max depth 18 feet lagoons/dump)
  - Radioactive debris
- Removal Assessment/Action
  - MERL sampling – high levels Lagoons/East Dump
  - Feb 2016 Action Memo
    - West Lagoon, East Dump, East Lagoon
    - Excavation/off-site disposal soils/debris
    - Removal action ongoing



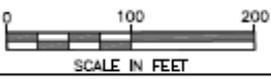
- ① PERSONNEL OFFICE BUILDING (OLD NURSES STATION)
- ② MACHINE SHOP
- ③ PIPE SHOP
- ④ MULTI-METALS WASTE TREATMENT PLANT
- ⑤ CARPENTER SHOP (ADJACENT TO MULTI-METALS WASTE TREATMENT PLANT)
- ⑥ WELL HOUSE
- ⑦ LACQUER STORAGE BUILDING
- ⑧ RADIUM VAULT
- ⑨ UTILITY BUILDING (SR-90 SOURCE VAULT)
- ⑩ 8' x 8' BUILDING
- ⑪ LIQUID WASTE BUILDING (INCLUDING UNDERGROUND TANKS)
- ⑫ OLD HOUSE
- ⑬ SOLID WASTE BUILDING
- ⑭ METAL SILO (ABOVE-GROUND)
- ⑮ ETCHING BUILDING
- ⑯ MAIN BUILDING - INCLUDES BASEMENT, FIRST FLOOR, SECOND FLOOR, AND ATTIC
- ⑰ CESIUM ION EXCHANGE HUT (ATTACHED TO MAIN BUILDING)
- ⑱ OLD GARAGE FOUNDATION (WHERE DRUMS OF REMOVED RADIOACTIVE WASTE WERE PREVIOUSLY STORED)
- ⑲ POLE BUILDING
- ⑳ NUCLEAR BUILDING (TRITIUM BUILDING)

LEGEND

- PROPERTY BOUNDARY
- WIRE FENCE
- STREAM
- 100 YEAR FLOOD ZONE
- ⓪ BUILDING NUMBER
- SOIL CLASSIFICATION 1
- SOIL CLASSIFICATION 2
- SOIL CLASSIFICATION 3
- 11 SURVEY UNIT NUMBER



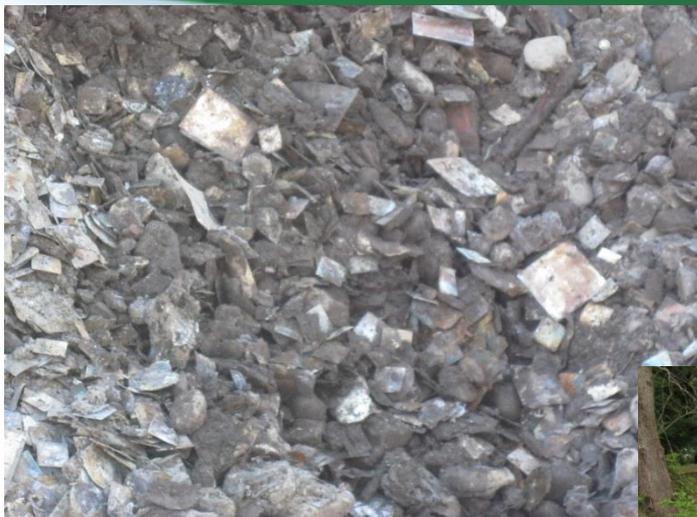
SURVEY UNIT LOCATION MAP  
SAFETY LIGHT CORPORATION  
BLOOMSBURG, COLUMBIA COUNTY,  
PENNSYLVANIA



|                             |                        |
|-----------------------------|------------------------|
| FILE<br>112G01039GM04       | SCALE<br>AS NOTED      |
| FIGURE NUMBER<br>FIGURE 1-2 | REV DATE<br>0 04/20/10 |



# Dial Excavation



# East Lagoon Contamination





# West Dump Contamination

- Removal identified West Dump contamination on adjacent residential property
- West Dump sloped toward private property
- Removal scraped contaminated soils from private property and regraded West Dump slope
- During regrading, highly contaminated discrete objects were found near the surface and removed
- West Dump operations were halted due to more pressing threats and a temporary cap was placed
- West Dump likely contains additional contaminated soils/discrete objects



*Note that the adjacent property is immediately adjacent to West Dump contamination*

# Summary of Site Risks



| Site Area               | Cancer Risk  |   | Hazard Index | Max Ra-226 Conc. (pCi/g)   |
|-------------------------|--|---|--------------|--|
|                         | Radionuclide   | Non-Radionuclide  |              |  |
| West Lagoon             | 2E-02  | 2E-01   | 53           | 2,390  |
| East Dump               | 6E-02  | 6E-04   | 1            | 889  |
| East Lagoon             | 2E-02  | 3E-03   | 10           | 3,366  |
| West Dump**<br>Debris   | 27,000 dpm alpha contamination<br>Alpha contamination is removable<br>(i.e., may be transferred from one surface to another) |   |              |  |
| Beta<br>"Fleas"/Nuggets | 26R/hr<br>Strong enough to cause radiation burns   |  |              |  |

\*\* West Dump risk assessment to be updated. Cancer risks will be consistent with West Lagoon, East Dump, East Lagoon.



## Proposed Early-Interim Remedy

- Excavate soils with COC concentrations  $>$  proposed PRGs to native soil or groundwater table, whichever occurs first, or maximum extent practicable based on Site or excavation conditions.
- No confirmation sampling
  - Final PRGs not established
  - EPA cleanup number is not practical at this time because surrounding contamination is significant
  - Gamma walkovers will be conducted
  - Soil samples will be collected prior to backfilling



## Reasons for Early-Interim RA Human Health/Environment

- Trespassing
  - Site Fence but trespassing observed & documented
  - Discrete objects/items could be carried off property
- Flood Prone – 100 Year Flood Plain
  - Several floods have already occurred most recent Tropical Storm Lee 2011
  - Contaminated soil/items could be transported to adjacent or downstream residential properties



PA STATE ROUTE 144 OLD BERWICK ROAD

WATER TANK

EAST DUMP

WEST LAGOON

EAST LAGOON

DISCHARGE PIPES

WEST DUMP

OUTFALL PIPE

DRAINAGE DITCH

RUSSELLS RIVER



# EPA Radiation Protection Website



## Radiation Protection

[Contact Us](#) Search:  All EPA  This Area

You are here: [EPA Home](#) » Radiation Protection

[Students/Teachers](#) [Librarians](#) [Reporters](#) [General Public](#) [Technical Users](#)

[PROGRAMS](#) [TOPICS](#) [REFERENCES](#)

## Radiation Protection

### Waste Isolation Pilot Plant (WIPP)

- [Learn more about EPA's Response to the 2014 Radioactive Release at the Waste Isolation Pilot Plant](#)
- [See EPA's WIPP Response Photo Gallery](#)

### Fukushima Information and Resources

EPA's air monitoring data have not shown any radioactive elements associated with the damaged Japanese reactors since late 2011, and even then, the levels found were very low—always well below any level of public health concern.

We are providing the following links to the most current information from trusted scientific organizations that continue to monitor the situation:

- [Situational Updates – International Atomic Energy Agency \(IAEA\)](#) [EXIT Disclaimer](#)
- [Current Radiation Monitoring: RadNet - U.S. Environmental Protection Agency \(EPA\)](#)
- [Food Safety –](#)
  - [U.S. Food and Drug Administration \(FDA\)](#)
  - [National Academies of Science \(NAS\) \(PDF\)](#) (6 pp, 638 K) [EXIT Disclaimer](#)
  - [Woods Hole Oceanographic Institution](#) [EXIT Disclaimer](#)
- [Marine Debris – National Oceanic and Atmospheric Administration \(NOAA\)](#)

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[Radiation Programs](#)

[Waste Management](#)

[Emergency](#)

[Response](#)

[Air & Water](#)

[Source Reduction & Management](#)

[Naturally-Occurring Radiation](#)

[Cleanup & Multi-Agency](#)

[Risk Assessment & Federal Guidance](#)

[Environmental Monitoring & Data](#)

[References](#)

[Frequent Questions](#)

[Site Map](#)

[A-Z Subject Index](#)



## For additional information

Marcos Aquino, Radiation Program Manager

US Environmental Protection Agency

1650 Arch Street

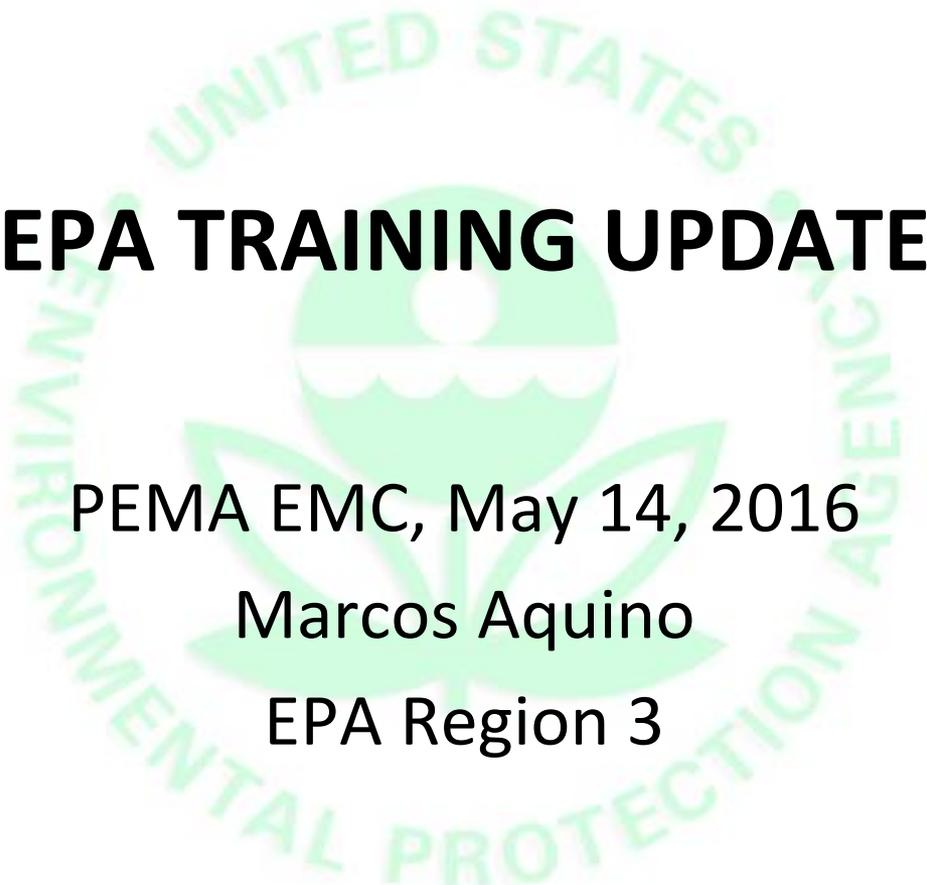
Philadelphia, PA 19103

215-814-3422

[aquino.marcos@epa.gov](mailto:aquino.marcos@epa.gov)

<http://www.epa.gov/aboutepa/region3.html>

<http://www.epa.gov/reg3artd/radiation/radiation.htm>



# **EPA TRAINING UPDATE**

PEMA EMC, May 14, 2016

Marcos Aquino

EPA Region 3



## What am I covering today

- Who am I
- What do I do
- What does EPA offer in the area of training
  - TRAINEX
  - ITRC



# Regional Radiation Program Manager Duties

- Regions health physicist, RSO
- Interacts with other Federal, state, local authorities and the public
- EPA Region 3's FEMA REP-RAC member
- Regional Advisor during rad events
- Region 3 RadNet contact
- Former OSC, 8 years (2000-2008)
- EPA clean-up program 11 yrs





## EPA Region 3

Office 1650 Arch Street,  
next to Comcast Building

- Wheeling, WV
- ESC, Ft Meade, MD
- COOP & Equipment in Boothwyn, PA
- Rolling stock at Lynwood, PA garage and warehouse



Delaware, District of Columbia, Maryland,  
Pennsylvania, Virginia and West Virginia



Authority and Capability

# EPA RAD RESPONSE



## Overview

- Authorities
- EPA Preparedness Activities
- EPA Response Roles
- EPA Response Assets





# EPA's Radiological Authorities

- EPA's radiological emergency response program was created to fulfill responsibilities under:
  - Statutes such as:
    - Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or Superfund)
    - Atomic Energy Act
  - Federal plans such as:
    - National Response Framework: Nuclear/Radiological Incident Annex



## Preparedness, Continuing Coordination Role

- DHS/FEMA
  - Federal Radiological Preparedness Coordinating Committee(FRPCC)
  - Radiological Emergency Preparedness (REP)
- DOE
  - Nuclear Incident Response Team (NIRT)
- NRT (National Response Team)
- DOD/NORTHCOM





## EPA's Radiological Emergency Response Role

---

- Emergency preparedness planning
- Development of Protective Action Guides (PAGs)
  - Provide recommendations during emergencies
- Emergency response support (or lead) federal response to radiological emergencies
  - Monitoring and assessment of release impacts
- Recovery, clean-up, & mitigation coordination



## Consequences Response Role

- Provide overall response coordination (NCP/ESF#10)
- Perform and coordinate radiological monitoring and assessment
  - Assist DOE and lead the Federal Radiological Monitoring and Assessment Center (FRMAC) in the long-term phase
- Provide “Special Teams” radiological expertise
- Serve as Coordinating Agency under the NRF’s Nuclear/Radiological Incident Annex in some circumstances
  - Unowned/unlicensed sources, foreign incidents with impacts on the U.S.



# EPA Training

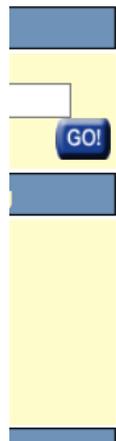
- TRAINEX
- ITRC



# EPA Training: TRAINEX



May 14, 2016



## Trainex News and Events



### Basic Overview of Superfund Online Training Course

[Please click here for more information about the Basic Overview of Superfund Online Training Course.](#)

For more on-line training opportunities please click [here](#).

### CERCLA Education Center (CEC) Course News



See below for links to all the CEC training offerings we have scheduled:

- [Remedial Design/Remedial Action \(RD/RA\)](#) - Denver, CO, June 8-9, 2016
- [Removal Process for RPMs](#) - Atlanta, GA, June 14-15, 2016
- [IGCEs for RPMs: From Scoping to Funding](#) - Atlanta, GA, June 28, 2016

## Training Partners



[U.S. Environmental Protection Agency](#)



[Interstate Technology Regulatory Council \(ITRC\)](#)



# TRAINEX: Training Partners



- **Community Involvement University - CIU**
- **Interstate Technology and Regulatory Council (ITRC)**
- **Environmental Response Training Program E RTP**
- **National Enforcement Training Institute (NETI) eLearning Center**



# TRAINEX: Training Partners



- Community Involvement University - CIU
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- Environmental Response Training Program E RTP
- National Enforcement Training Institute (NETI) eLearning Center



# HAZWOPER Training

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[By Training Partner](#)  
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## Course Catalog

[By Course Title](#)  
[By Training Partner](#)  
[By Delivery Method](#)

## Students

## HAZWOPER TRAINING RESOURCES

- ◆ [Standard 29 CFR 1910.120](#) Leaving Trainex   
Technical detail the rules and regulations governing Hazardous Waste Operations and Emergency Respon (HAZWOPER).
- ◆ [Frequently Asked Questions about HAZWOPER](#) Leaving Trainex 
- ◆ [Who Can Answer Questions About HAZWOPER & Other Standards and Rules?](#) Leaving Trainex 
- ◆ [Classroom Courses](#)
- ◆ [National Institute of Environmental Health Sciences \(NIEHS\) Worker Education Training Program \(WETP\)](#)
- ◆ [ERTP Approved External Training Providers](#)

## Classroom Courses



# Other training: Radiation



[Trainex Home](#) May 14, 2016

**Search**

Enter a search term

**GO!**

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[By Delivery Method](#)

## SEARCH RESULTS

Searched Training Exchange for 'radiation'.  
Results 1 - 10 of 25. Search took 0.09 seconds.

**Radiation Task Force Leader (RTFL)** 98%

This 10-day **radiation** safety course is designed for U.S. EPA Response Support Corps (RSC) personnel who will augment the existing Emergency Response Program personnel in a response to a major radiological contamination incident. RTFLs will be assigned roles within the Incident Command System (ICS) organization. These individuals will perform a variety of activities including: radiological surveyin...  
<http://trainex.org/offerinaslist.cfm?courseid=880>



# ITRC Training

[Training](#) > [Radionuclides](#) > Radionuclides

Radionuclides

## ITRC Documents Associated with this Topic

- [Radionuclides Documents](#)

The Radionuclides training courses address characterizing radioactively contaminated sites, cleanup goals, decontamination and decommissioning, and long-term stewardship.

### Decontamination and Decommissioning of Radiologically-Contaminated Facilities

The decontamination and decommissioning (D&D) of radiologically-contaminated facilities presents numerous challenges. Many tasks are involved, each of which requires adherence to a complex array of federal and state regulations and policies, attention to health and safety issues for workers and the public, monitoring and management of schedules and costs, and interaction with a potentially large number of stakeholders who have an interest in the present activities and future plans for sites undergoing D&D. Since large-scale D&D operations at nuclear facilities began in the 1970s, one of the most noticeable advances has been dramatic decreases in decommissioning cost. This change is the result of a combination of accumulated decommissioning operational experience reducing the high initial cost estimates (which were high due to uncertainties and poorly defined boundaries), evolution of regulatory guidance, and continuously-developing technologies.

A large body of knowledge has already been accumulated on D&D operations. At the present time, approximately 90 commercial power reactors, 250 research reactors, 100 mines, 5 reprocessing facilities, and 14 fuel fabrication plants have been retired from operation, with some having been fully dismantled. In addition, the largest environmental cleanup projects ever undertaken are in progress or have recently been completed at several large DOE facilities in the nuclear weapons complex. Technologies developed for the D&D portions of these cleanups are part of the lessons learned from these projects.

This training introduces regulators, cleanup contractors, site owners/operators, and technology providers to ITRC's Technical/Regulatory Guidance, [Decontamination and Decommissioning of Radiologically-Contaminated Facilities](#) (RAD-5, 2008), created by ITRC's Radionuclides Team. The curriculum is composed of four modules as follows:

- Module 1: Introduction and Regulatory Basis for D&D
- Module 2: Factors for Implementing D&D
- Module 3: Preliminary Remediation Goal (PRG) Calculators
- Module 4: Case Studies and Lessons Learned



# CLU-IN.ORG



**Go to Training**

**Links**

**CLU-IN Studio**

 **United States Environmental Protection Agency**

**Technology Innovation and Field Services Division**

**Decontamination and Decommissioning of Radiologically-Contaminated Facilities**  
*Sponsored by: Interstate Technology and Regulatory Council*



|  |  |                               |
|--|--|-------------------------------|
| <b>Original Time/Date of Presentation:</b> | March 4, 2010, 11:00 AM - 1:15 PM, EST (16:00-18:15 GMT)   | <a href="#">Start Archive</a> |
|  | <p>The decontamination and decommissioning (D&amp;D) of radiologically-contaminated facilities presents numerous challenges. Many tasks are involved, each of which requires adherence to a complex array of federal and state regulations and policies, attention to health and safety issues for workers and the public, monitoring and management of schedules and costs, and interaction with a potentially large number of stakeholders who have an interest in the present activities and future plans for sites undergoing D&amp;D. Since large-scale D&amp;D operations at nuclear facilities began in the 1970s, one of the most noticeable advances has been dramatic decreases in decommissioning cost. This change is the result of a combination of accumulated decommissioning operational experience reducing the high initial cost estimates (which were high due to uncertainties and poorly defined boundaries), evolution of regulatory guidance, and continuously-developing technologies.</p> |                               |

1

# Welcome – Thanks for joining us. ITRC's Internet-based Training Program

---



## Decontamination and Decommissioning of Radiologically- Contaminated Facilities



**ITRC Technical and Regulatory Guidance Document:  
Decontamination and Decommissioning of Radiologically  
Contaminated Facilities (RAD-5, 2008)**



# INTERSTATE TECHNOLOGY & REGULATORY COUNCIL

Advancing Environmental Solutions

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- Training
- Documents
- Teams
- Program Areas
- Membership
- Private Sector (IAP)
- Meetings
- Success Stories

## Radionuclides Documents

[Documents](#) > [Radionuclides](#) > Radionuclides

**Training Courses**

- [Radionuclides Trainin](#)

The Radionuclides documents address characterizing radioactively contaminated sites, cleanup goals, decontamination and decommissioning, and long-term stewardship.

**Click on a document title to view it online and print. Or, right-click on the link and save the document to your local drive.**

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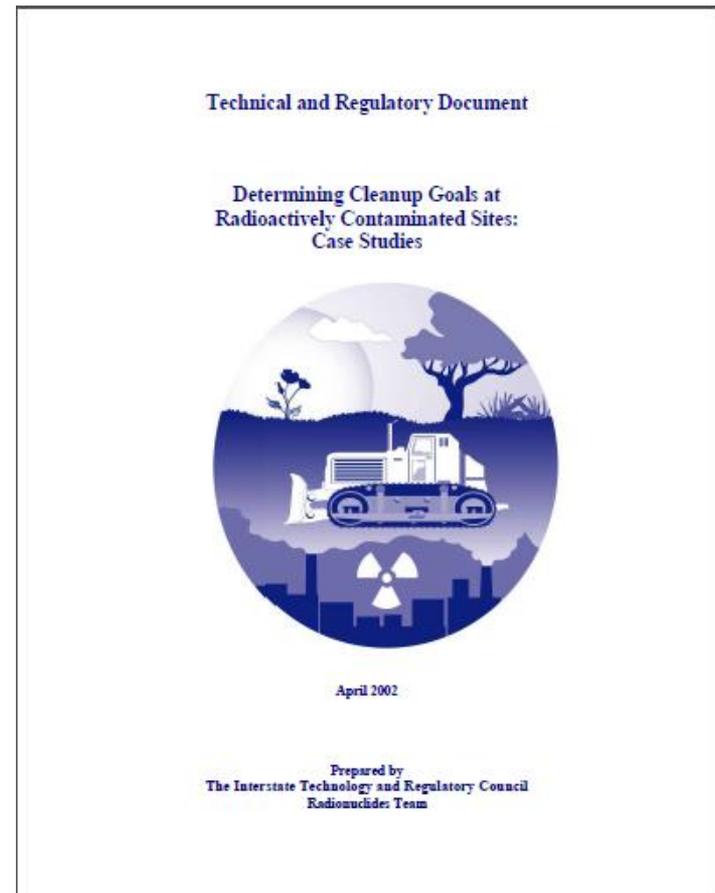


[Decontamination and Decommissioning of Radiologically Contaminated Facilities](#)  
(RAD-5) Jan-08



## Documents on ITRC

- Determining Cleanup Goals at Radionuclide Contaminated Sites: Case Studies





# EPA Training

- TRAINEX
  - <https://trainex.org/default.cfm>
- ITRC, Training, Radiation
  - <http://www.itrcweb.org/Training/ListEvents?topicID=21&subTopicID=24>



## For additional information

Marcos Aquino, Radiation Program Manager

US Environmental Protection Agency

1650 Arch Street

Philadelphia, PA 19103

215-814-3422

[aquino.marcos@epa.gov](mailto:aquino.marcos@epa.gov)

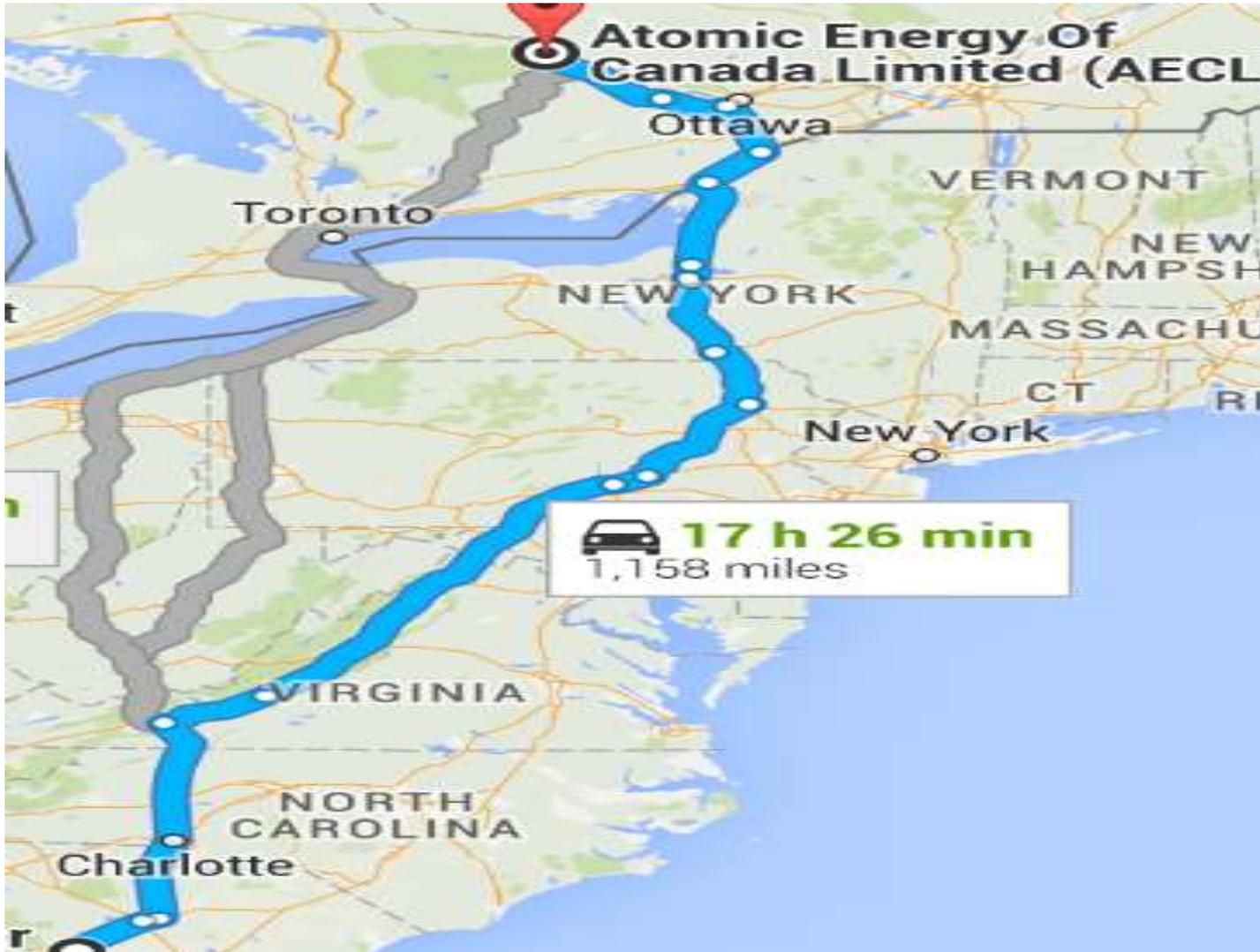
<http://www.epa.gov/aboutepa/region3.html>

<http://www.epa.gov/reg3artd/radiation/radiation.htm>

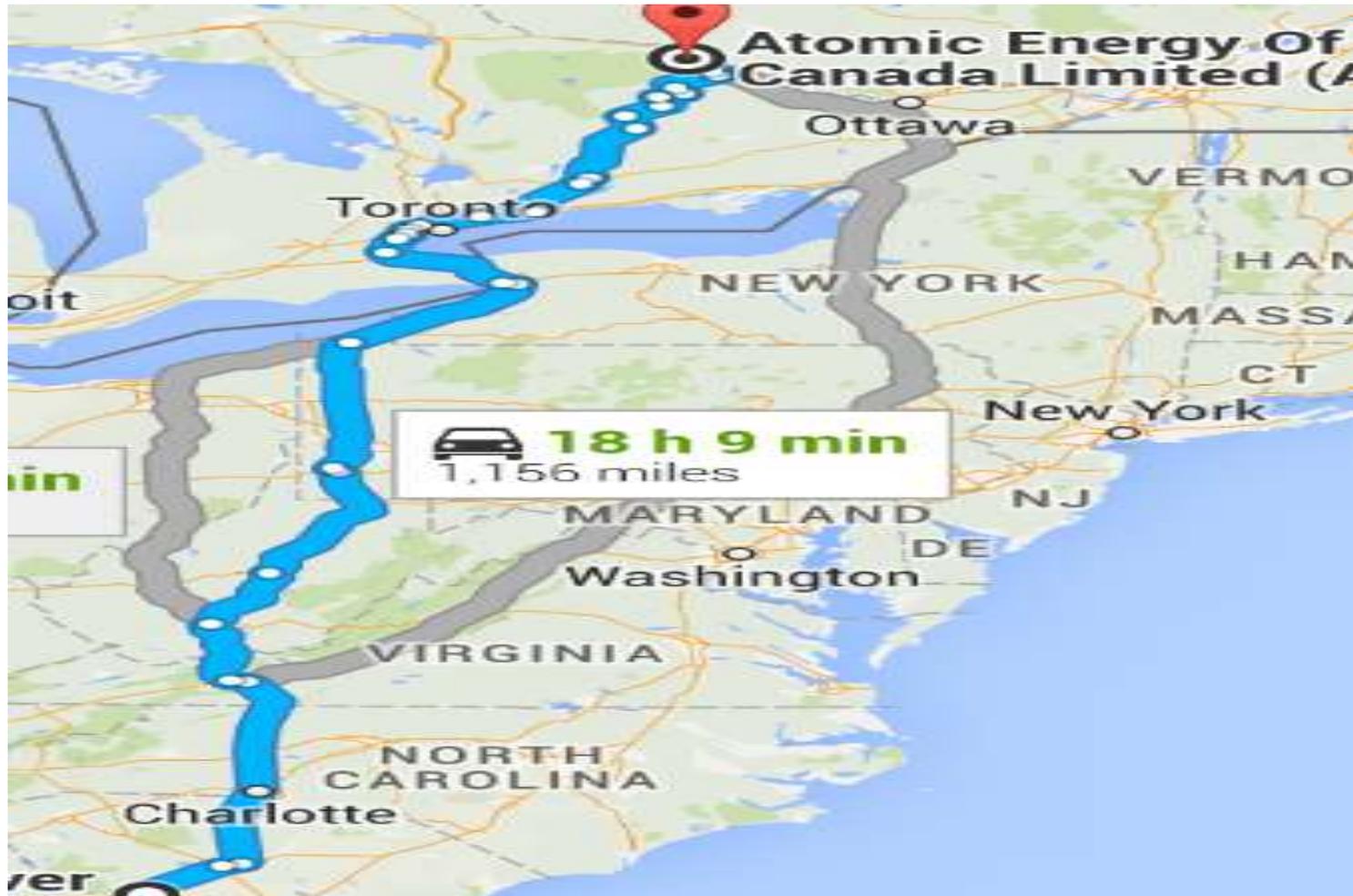
## **2015 RODEO B cask SNF Considerations, Canadian, and DOE/Navy B cask shipments**

- **Who: Dept. of Energy and National Nuclear Security Administration, (NNSA).**
- **What: B cask, Spent nuclear fuel, (SNF), highly enriched uranium, (HEU), and radioactive solution waste/recycled material, (radioactive nitric acid).**
- **Where: From Chalk River Isotope production facility, Canada, to the DOE Savana River Site in South Carolina.**

# I-81 Route



# I-90 to I-79 Route



# **2015 RODEO SNF Considerations**

- **When: August/September, 2015-2017.**
- **Why: Within the Department of Energy, the National Nuclear Security Administration, (NNSA), has been tasked with managing the Global Threat Reduction Initiative, (GTRI).  
There are >2,000 metric tons of weapons-useable HEU or plutonium in over 25 countries.  
Since 2012, 7 of 32 countries have reduced the amount of Weapons-Useable HEU or Plutonium to <1Kg, (2.2lb).**

# **Why: Continued**

- **Fresh HEU has long been shipped from the US to Canada for production of medical isotopes.**
- **The HEU and “waste” from Canada is to be processed for reuse, or “downblended” into Low Enriched Uranium, (LEU) at the Savana River Site.**
- **With LEU, countries can still operate their nuclear power plants, conduct scientific research, and produce medical grade isotopes.**

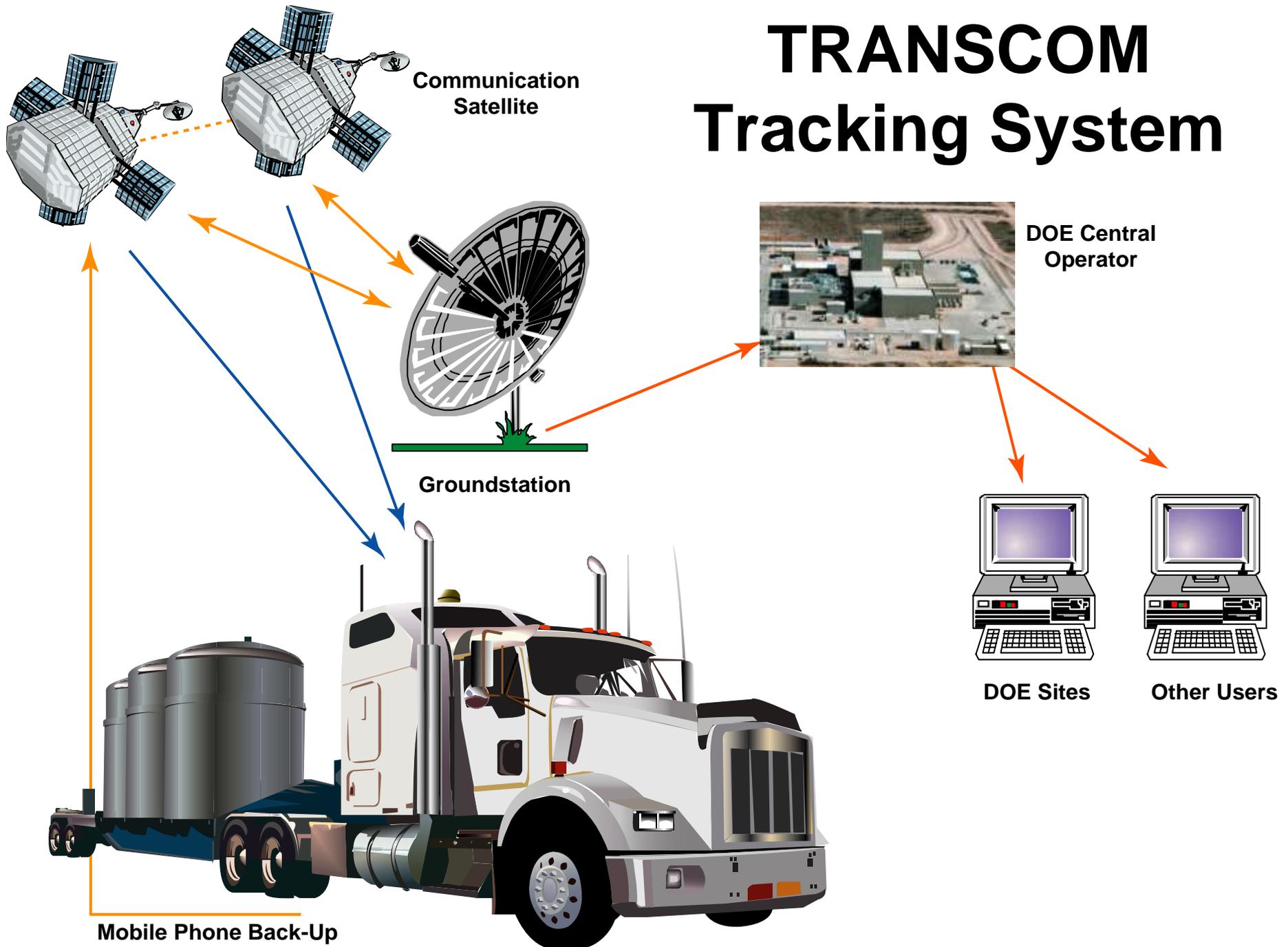
# Youtube of Type B cask crash test

- [Cask Test 1978](#)

# **ADDITIONAL B Casks**

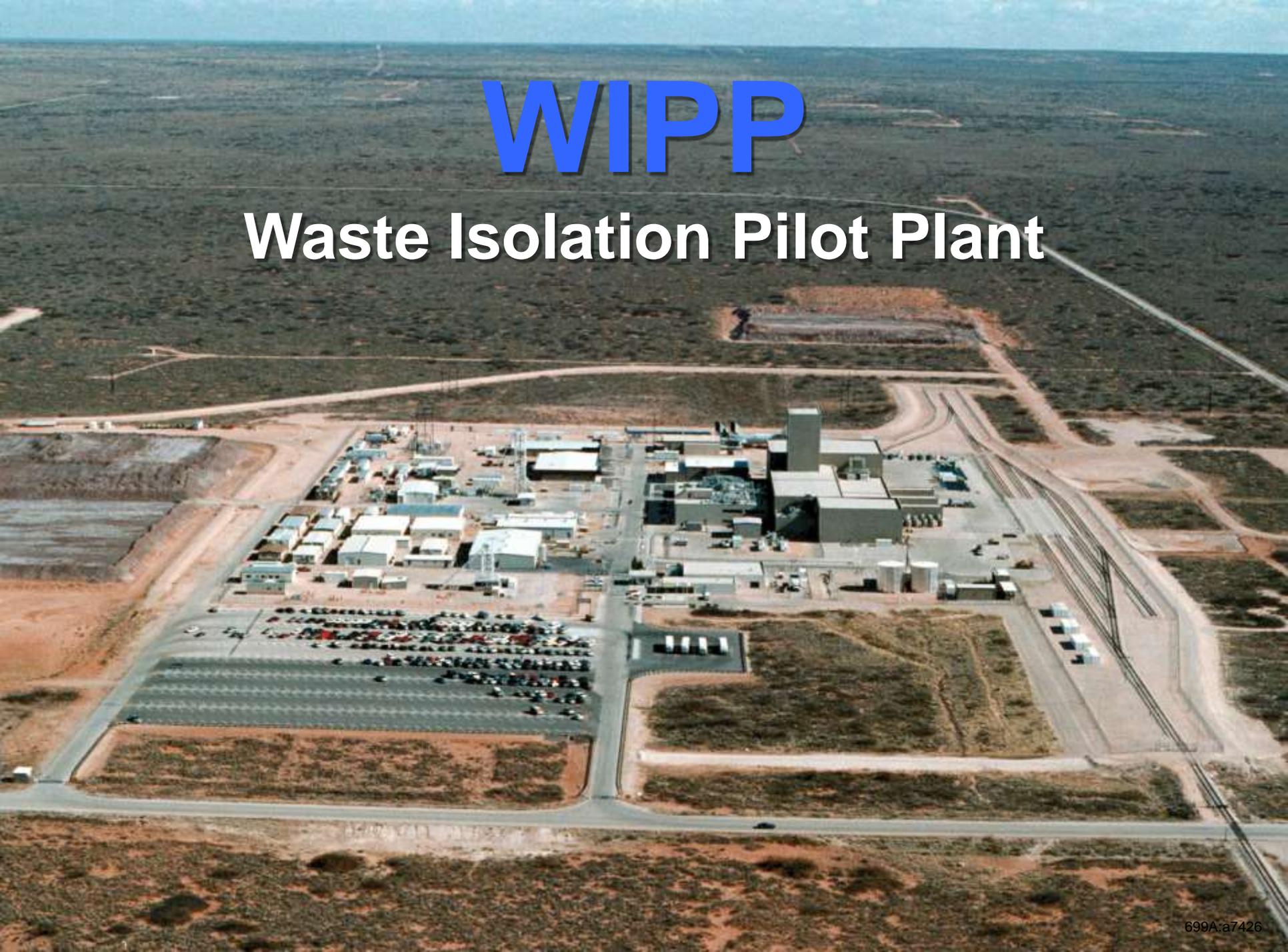
- **Travel by Rail and Highway to the Waste Isolation Pilot Plant, (WIPP) in Carlsbad, NM, (TRU, ((Transuranic Materials)).**
- **Travel by Rail and Highway to a DOE/Navy classified site in the West, (HLRW).**
- **All are tracked using the Transcom tracking system, and are escorted by either the State Police, or DOE Security Personnel.**

# TRANSCOM Tracking System



# WIPP

## Waste Isolation Pilot Plant

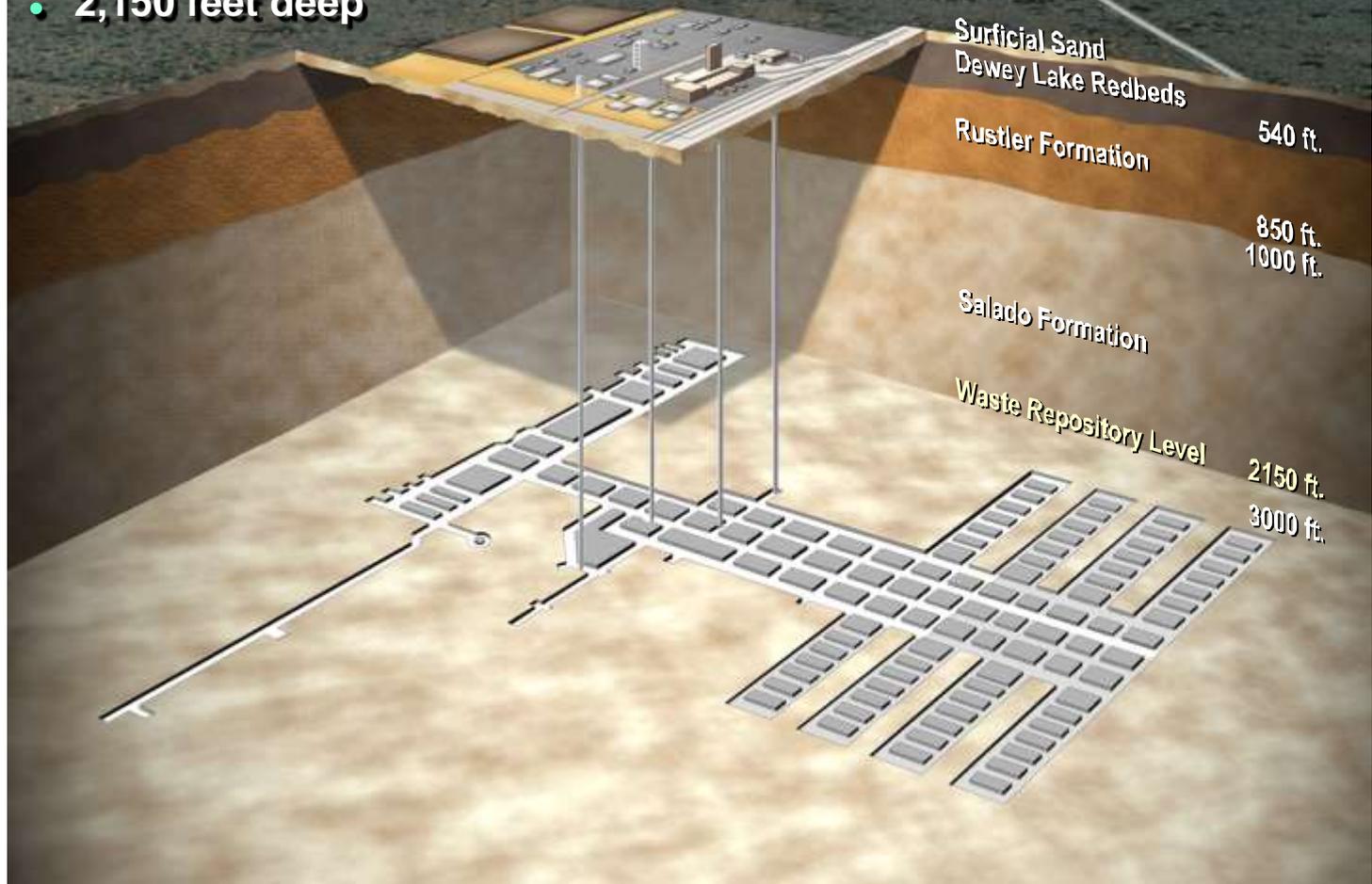




# Waste Isolation Pilot Plant

## Environmentally Safe Nuclear Waste Disposal

- U.S. Department of Energy facility
- Designed for permanent disposal of transuranic radioactive waste
- 2,150 feet deep

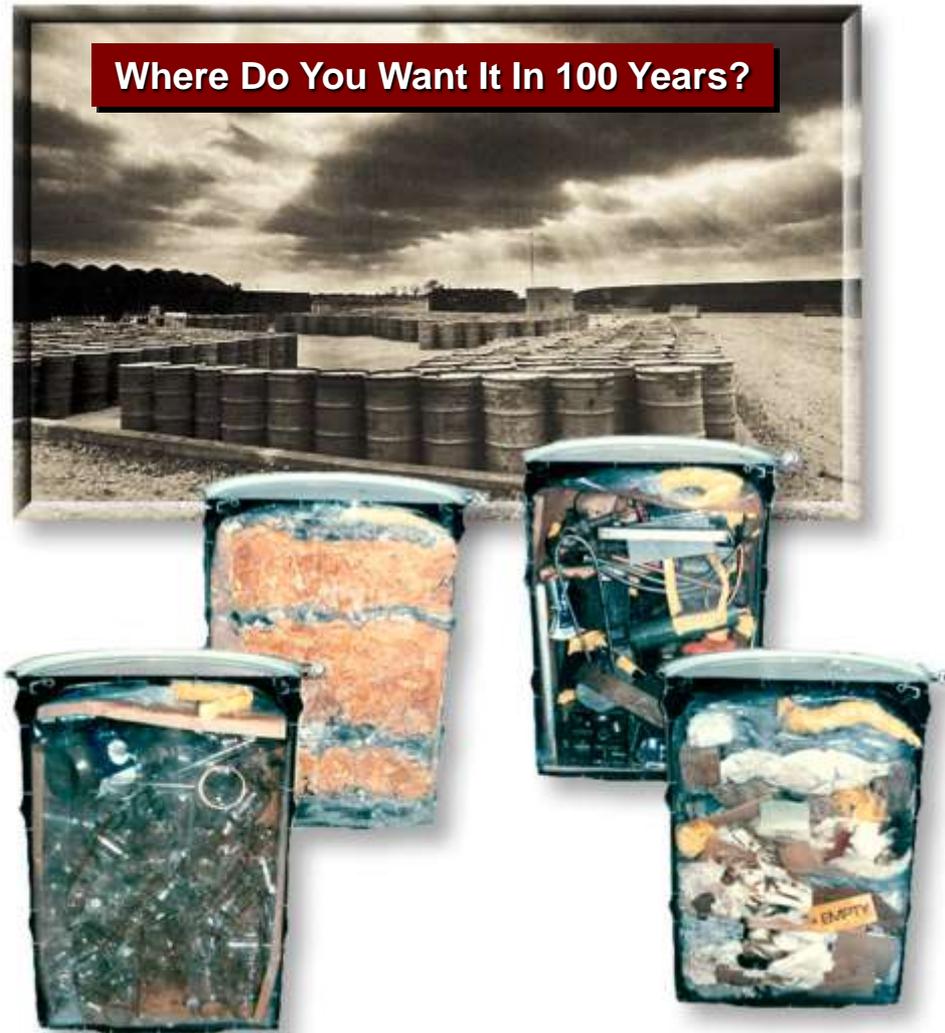


# Site Selection

- Bedded salt
- Remote region
- Depth
- Geologically stable
- Absence of water

**“The best means of long-term disposal...  
is deep geological emplacement....”  
National Academy of Sciences**

# Transuranic (TRU) Waste



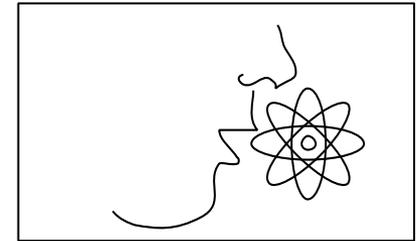
- **U.S. Defense program activities**
- **Consists of clothing, tools, rags, and other such items**
- **Contaminated with trace amounts of radioactive and hazardous elements**

# **Transuranic Waste, (TRU), is:**

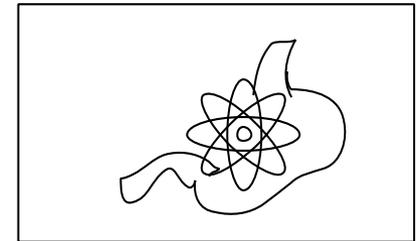
- **Waste contaminated with alpha emitting transuranic radionuclides.**
- **Have a half life greater than 20 years**
- **In concentrations greater than 100nCi/g, (3.7MBq/kg).**
- **Elements having atomic numbers greater than Uranium, (92 protons), Americium 241, Polonium.**
- **Byproduct of weapons production, nuclear research, and power production, (mainly polonium).**

# Risks to the Public From Transuranic Waste

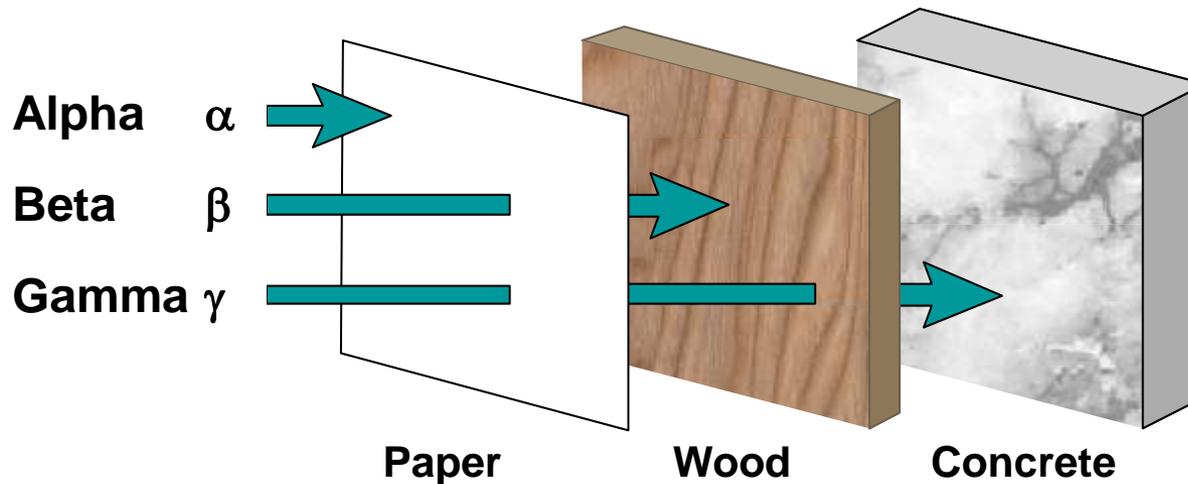
- Risk to humans from alpha are:
  - Inhalation
  - Ingestion



**Inhalation**



**Ingestion**



- **Solution: Isolation from the biosphere**
  - “The best means of long-term disposal... is deep geological emplacement...”

*National Academy of Sciences*

“...The [WIPP transportation] system...  
is safer than that employed for any other  
hazardous material in the U.S. ...”

*WIPP Panel of the National Academy of Sciences*



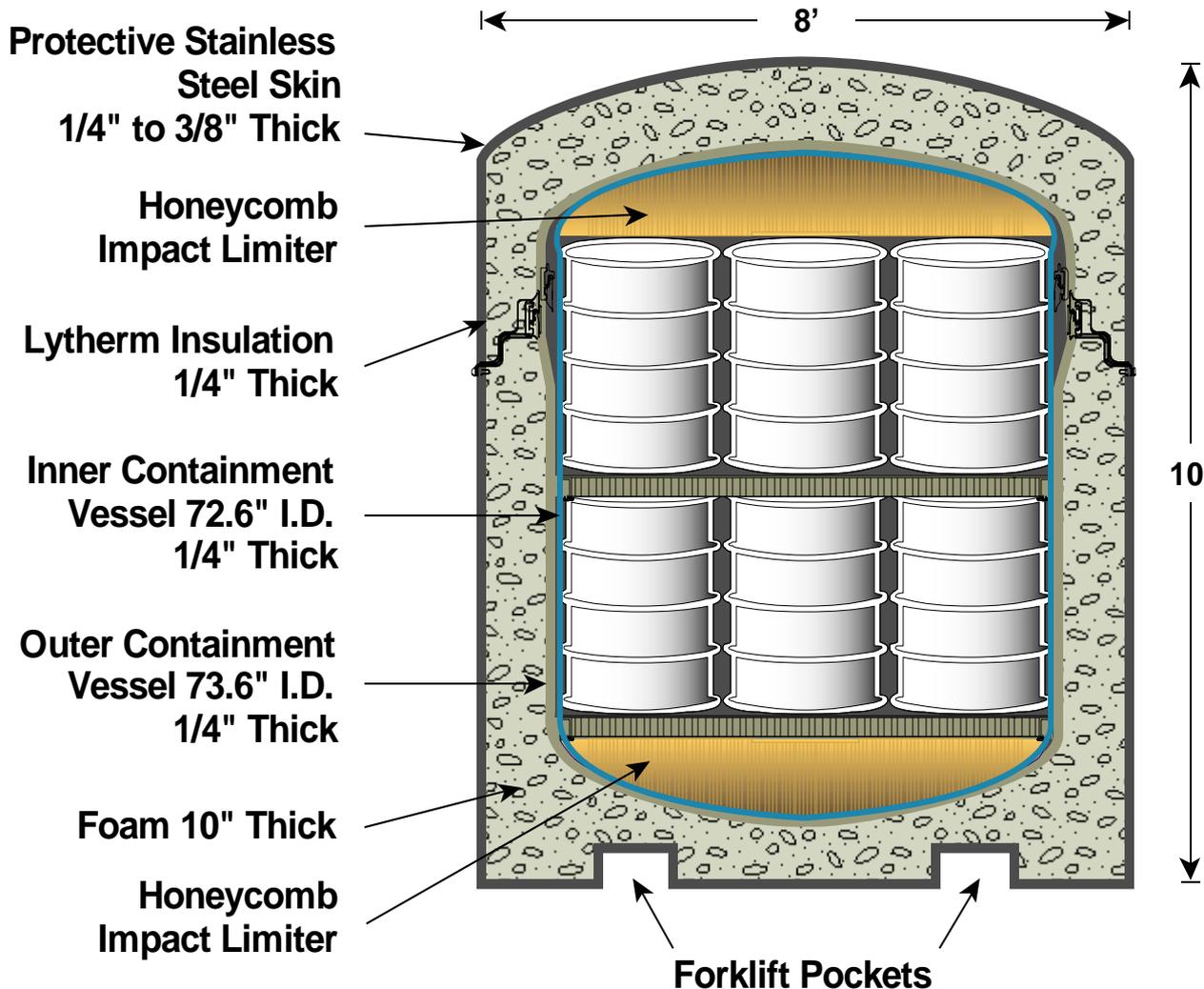
# Shipment Status

- Open the northern extension route in January 2000
  - First shipment as early as March
- Open the southern corridor route in September of 2000
  - First shipment as early as November





# TRUPACT-II



## Weight

12,705 lbs. empty

19,250 lbs. loaded

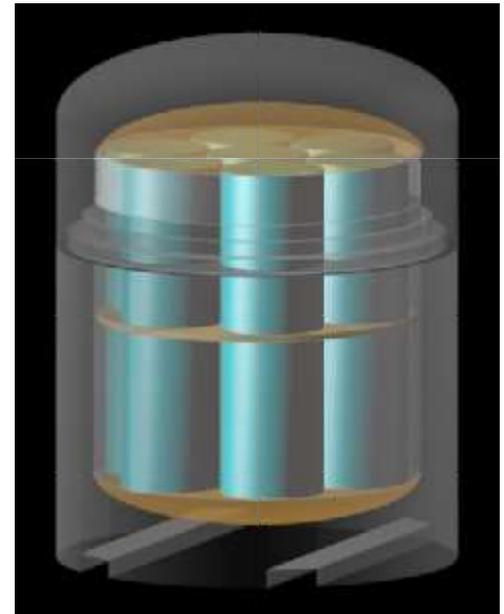
## Material

Stainless Steel

Polyurethane Foam

Ceramic Fiber

Insulation



# TRUPACT-II Testing

Nuclear Regulatory  
Commission-certified  
transportation package





# State Responsibilities

- Plan development
- Exercises and drills
- Organize training for emergency personnel
- Public awareness



# WIPP Emergency Response Training

## Courses

- Command and Control
- First Responder
- First Responder Refresher
- Incident Command Systems
- Mitigation
- Train the Trainer
- Medical Management

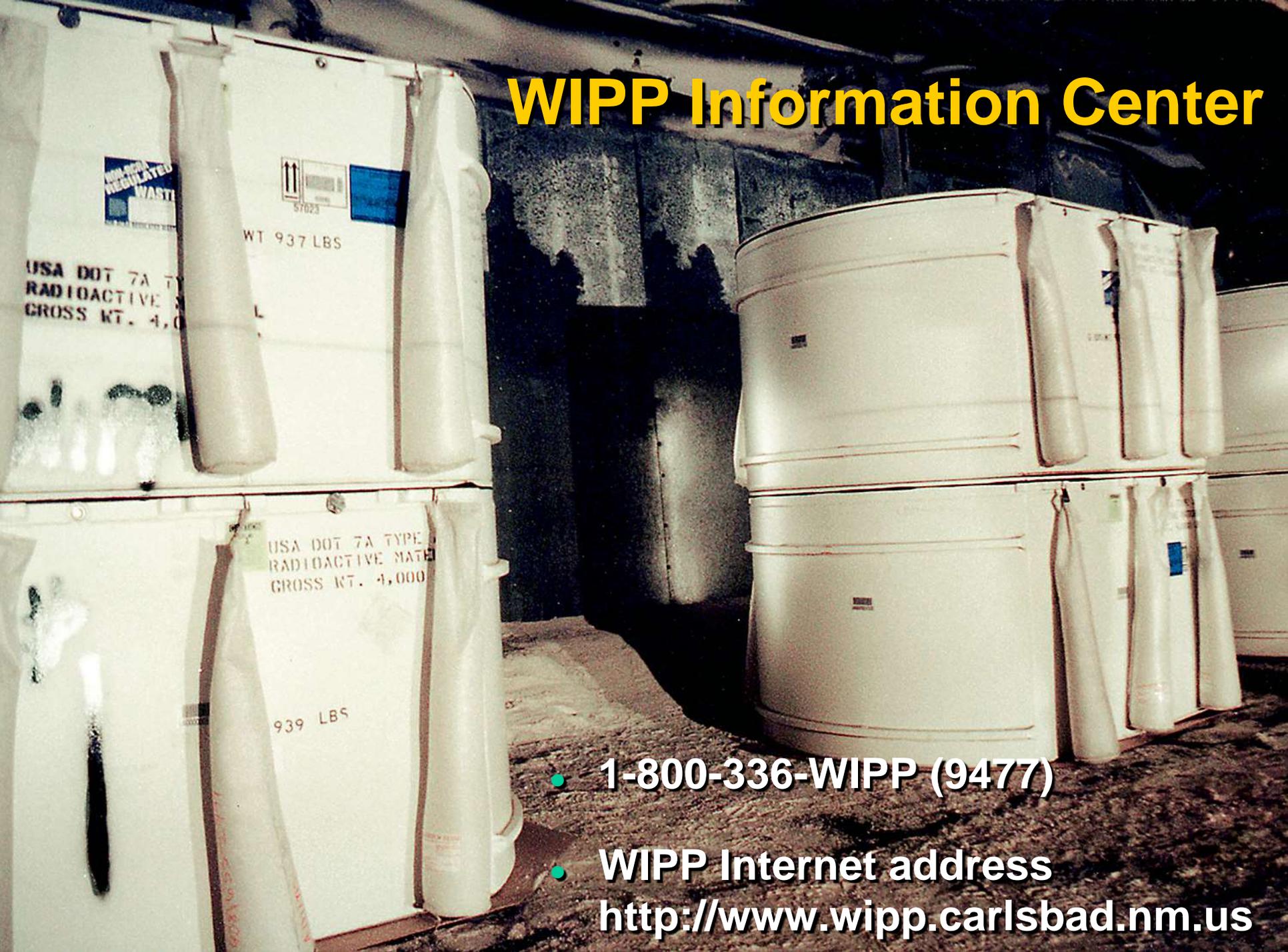
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**Total Trained**

**14,800**



# WIPP Information Center



- 1-800-336-WIPP (9477)
- WIPP Internet address  
<http://www.wipp.carlsbad.nm.us>









2

FOR TRAINING USE ONLY

394

EAST WASTE HANDLING DOCK

FOR TRAINING USE ONLY

BARREL CONTAINS SAND ONLY

THIS BARREL CONTAINS SAND ONLY

FOR TRAINING USE ONLY

BARREL CONTAINS SAND ONLY

1820

7036



CAUTION  
Warning  
Lift in  
Progress and Line  
Required Around  
Open Shaft!

MAX CAPACITY 75  
POUNDS MAXIMUM

B







17

18

19

# **We also have DOE SNF Shipments**

- **Travel by Highway and Rail.**
- **Have their own security escort.**
- **Are tracked by the Transcom system.**
- **Shipped in Type B casks on the highway.**
- **The High Level Radioactive Waste and Spent Nuclear Fuel are escorted by the State Police.**

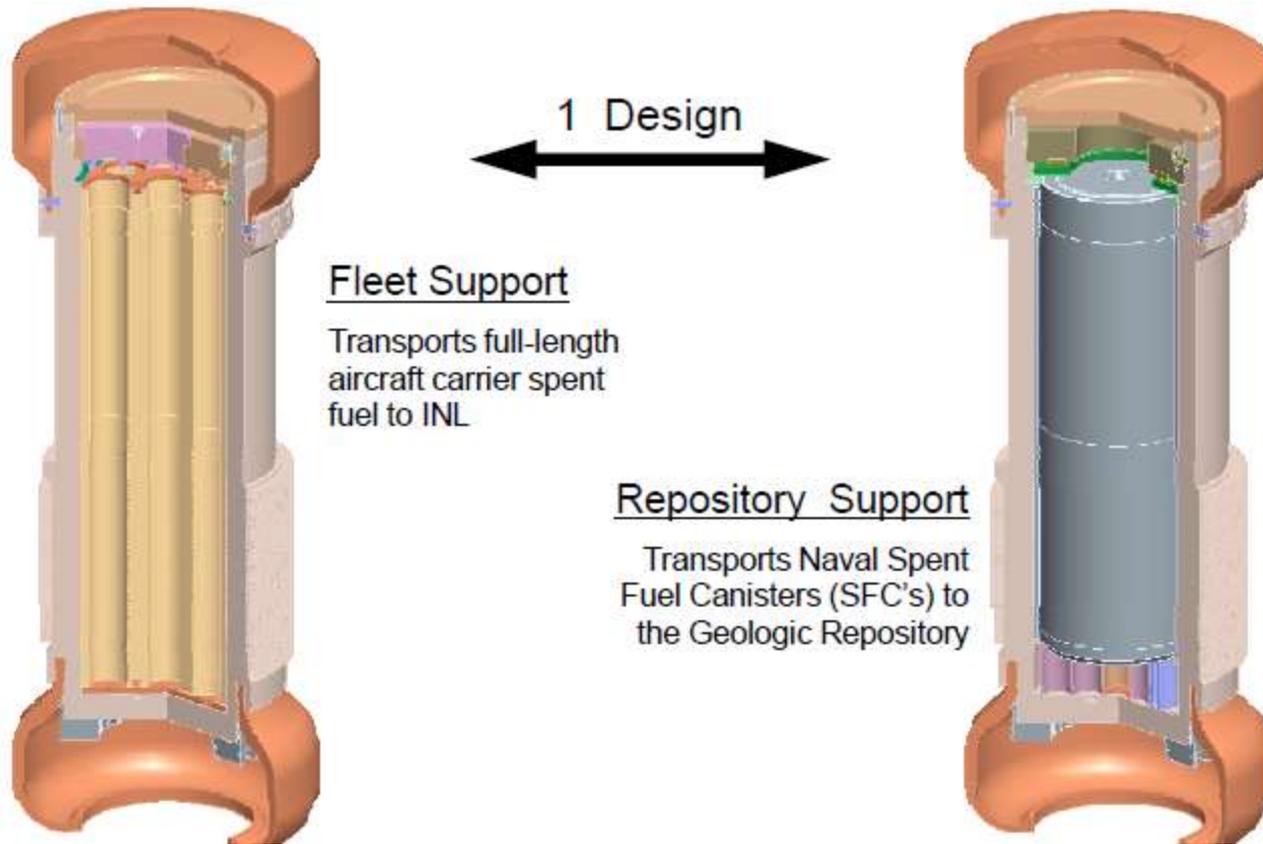
# M-140, accepts SNF “Cannisters”



# M-290, accepts SNF bundles



# M-290 Dual Purpose



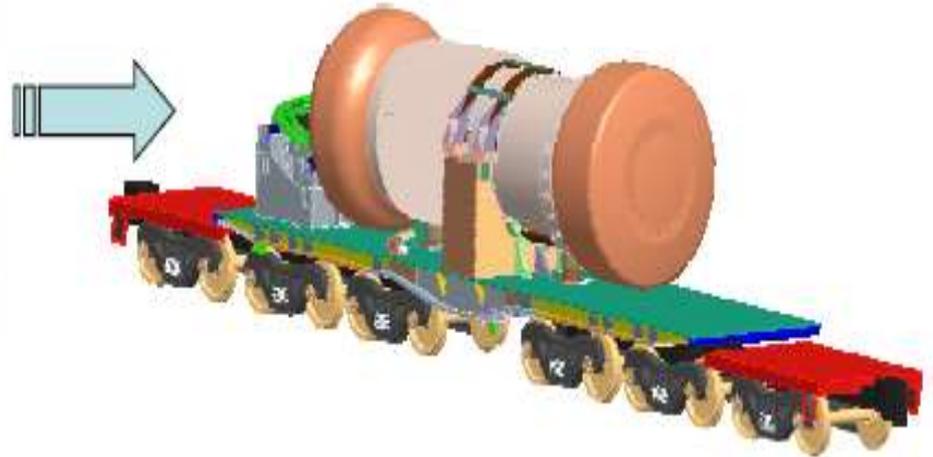
# The M-290 Replaces the M-140 for Carrier Spent Fuel



## Current M-140 System

(16.2 ft tall, 175 tons - loaded)

*requires spent fuel disassembly @ shipyard*



## New M-290 System

(30.1 ft long, 260 tons - loaded)

*accommodates full-length Carrier spent fuel*

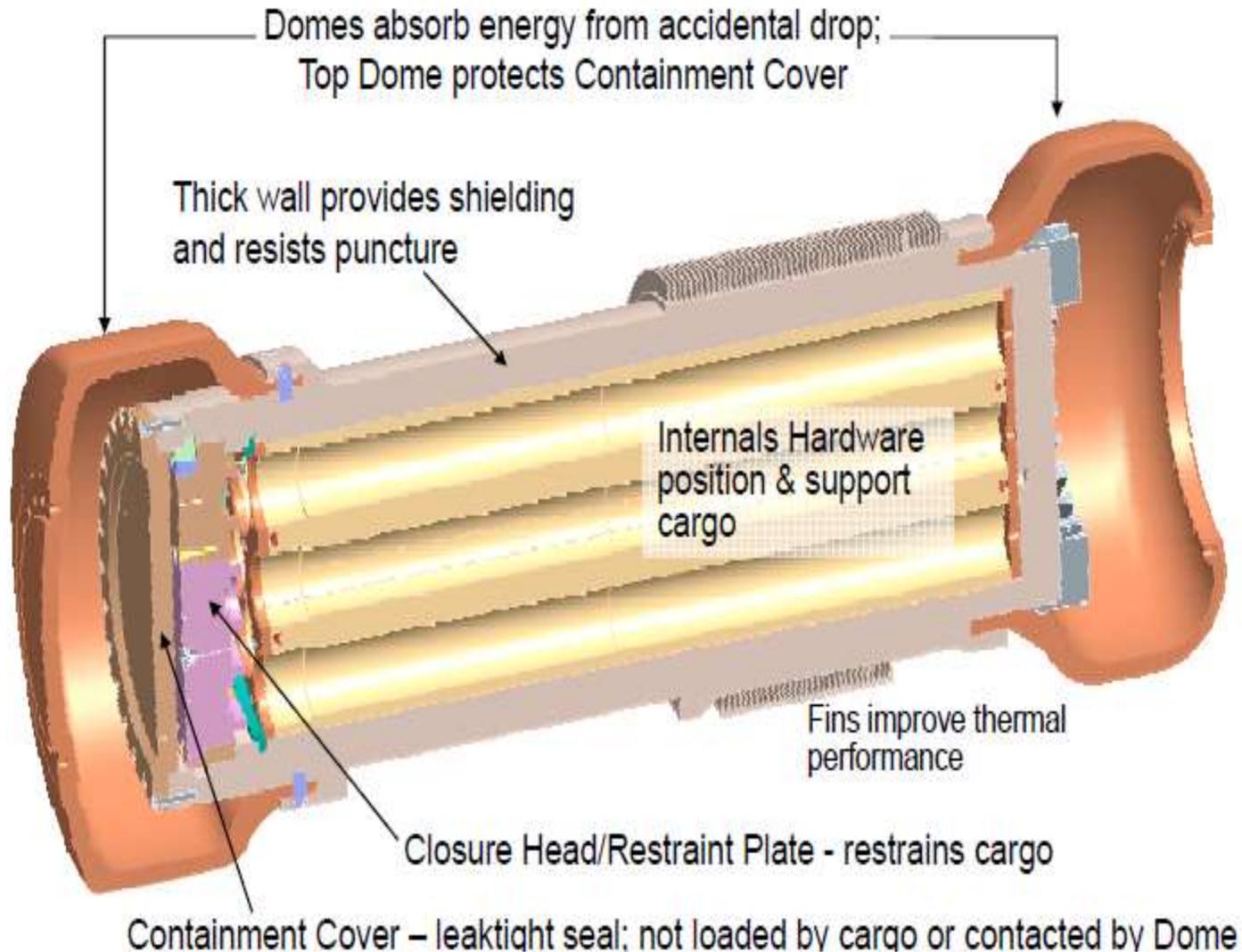
# M-290 Dimensions



## M-290 Dimensions

- Length
  - 30.1 ft with Domes
  - 22.9 ft, Cask alone
  - 21.6 ft, internal cavity
- Diameter
  - 10.7 ft at Domes
  - 8.8 ft, Cask alone
- Wall Thickness
  - 12.5 inches, lower Cask
  - 10.5 inches, upper Cask

# M-290 Containment Features



# M-290 lifting and handling



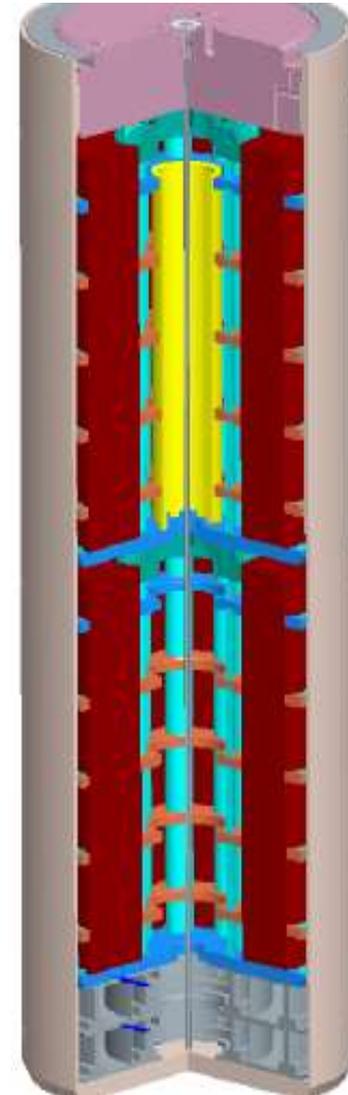
*The M-290 is designed so that, for normal operations, it can only be lifted with the domes attached.*

# Design Overview

- All-welded canister
- Planned for Direct Placement in Geologic Repository
- Also used for NRF on-site storage of Spent Fuel
  - Storage SAR per 10CFR72 (NRC reviewed Jan. 2001)
- Cargoes to Include All Naval Cores



Temporary Dry  
Storage at NRF



# Link to SNF storage cask youtube

- [SNF Storage cask youtube test](#)

# B Cask



# B Cask within Sea Container



# Youtube of Type B cask crash test

- [Cask Test 1978](#)

# **2015 SNF RODEO Scenario Objectives: Demonstrated and Simulated**

- **Simulate communications**
- **Demonstrate liaison with PSP, (traffic and security concerns).**
- **Demonstrate Initial Response/Scene Size-up and initial isolation zone, (using TEPP Flatsheet, 8 action items), and Hot/Warm/Cold handout/ERG.**
- **Simulate mon/decon station, med station, and PPE dress-out.**
- **Demonstrate charging of pencil dosimeters and recording on form, (pre and post entry)**

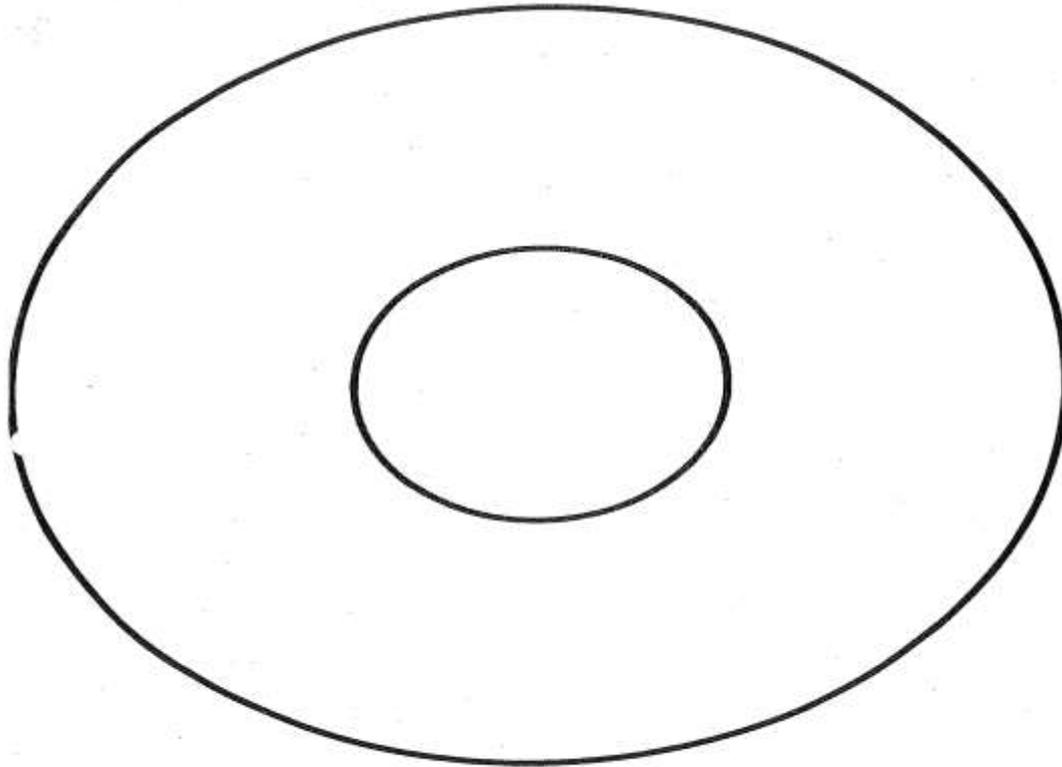
## **Objectives Demonstrated and Simulated**

- **Demonstrate survey instrument preoperational checks, calibration check.**
- **Demonstrate radiological survey and record findings using form(s) provided, and determine if package exceeds HRCQ limits for an Exclusive Use Vehicle. Also demonstrate use of “Identifinder” (if available), to ID material.**
- **Demonstrate swipe test using form provided to help determine if any contamination found, and record on Survey form.**

# **Objectives Demonstrated and Simulated**

- **Simulate/discuss: Cold/Warm/Hot Zones, (for both exposure and contamination).**
- **Demonstrate an understanding of the Inverse Square Law using the source provided, and draw it onto the Survey form.**
- **Report out findings to County EMA.**
- **Simulate: Chain of custody and sample submission to lab.**

# Safe/Unsafe/Dangerous



PEMA APPENDIX 3

ANNEX A

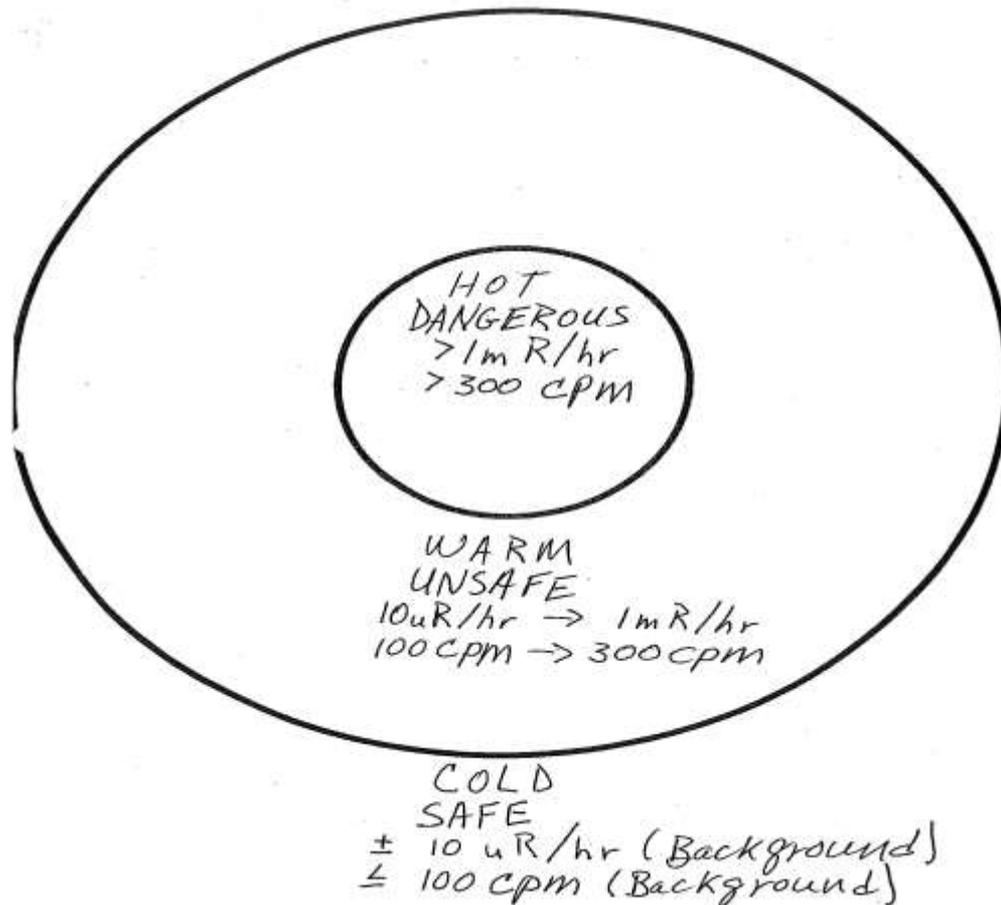
CONTAMINATION MONITORING AND

DECONTAMINATION GUIDANCE FOR RADIOLOGICAL EMERGENCY RESPONSE

**Table 1- Recommended Detection Parameters for Loose plus Fixed Widespread Contamination on Vehicles, Equipment and other Possessions.**

| <b>Instrument/<br/>Detector Type</b>           | <b>Decision Criteria</b>    | <b>Detection Parameters</b>              |  |
|--|-----------------------------|--|--|
|  |                             | <b>Maximum Probe<br/>Height (inches)</b> | <b>Maximum Probe<br/>Speed<br/>(inches/second)</b> |
| <b>Modern instruments<br/>w/pancake probes</b> | 300 cpm above<br>background | 1  | 24   |

# Safe/Unsafe/Dangerous-Rad





**Swipe, S pattern covering 10 square centimeters,  
(Contamination check AND a lab sample).**

DATE \_\_\_\_\_ TIME \_\_\_\_\_  
LOCATION \_\_\_\_\_  
\_\_\_\_\_ NO. \_\_\_\_\_  
TECHNICIAN \_\_\_\_\_  
COUNT  TYPE \_\_\_\_\_  
\_\_\_\_\_ FOLD HERE \_\_\_\_\_

800-933-8501

G/O CORPORATION



# Exercise, Radiological Survey Record Sheet, See TEPP for Trans. Pkg. requirements

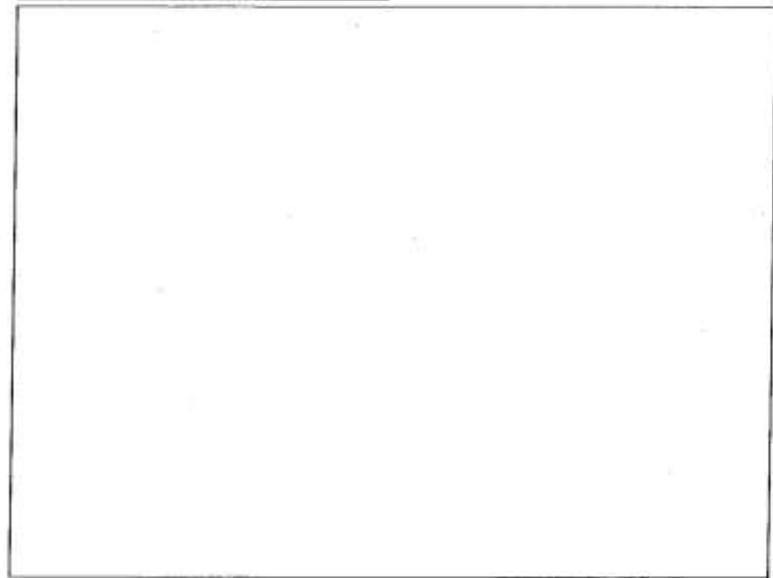
BRP-ER-G-D  
Rev. 0, 04/09  
Form D  
Page \_\_\_ of \_\_\_

## FORM D: PA BUREAU OF RADIATION PROTECTION RADIOLOGICAL SURVEY RECORD SHEET

Location: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Surveyed By: \_\_\_\_\_ Reviewed By: \_\_\_\_\_

| Instrument Information: | Instrument/Detector | Serial # | Calibration Due |
|-------------------------|---------------------|----------|-----------------|
| 1.                      | _____               | _____    | _____           |
| 2.                      | _____               | _____    | _____           |

Diagram of Area/Equipment Surveyed:



| Smear Survey Results<br>(CPM/100 cm <sup>2</sup> ) β-γ |       |
|--|-------|
| #  | Count |
| 1  |       |
| 2  |       |
| 3  |       |
| 4  |       |
| 5  |       |
| 6  |       |
| 7  |       |
| 8  |       |
| 9  |       |
| 10   |       |
| 11   |       |
| 12   |       |

Notes:

| Legend |                         |  |
|--------|-------------------------|--|
| ○      | - Smear Sample Location | △  |
|        |                         | - Air Sample Location                        |
|        |                         | Identify Dose Rate Units (mR/hr, R/hr, etc.) |
| XXXX γ | XXXX - Contact Reading  | γ - Radiation Type                           |
| YYYY   | YYYY - Reading at 30 cm |  |

# Dosimeter Charger



Shown with optional pencil dosimeter in place.

# Zero The Dosimeter





# DOT Table 6 - Radiation Level Limitations

| Package and Vehicle Radiation Level Limits (§ 173.441) <sup>1</sup> |   |                                  |  |   |
|---|---|----------------------------------|--|---|
|   |   | Nonexclusive Use Shipment        | Exclusive Use Shipment                 |   |
|   |   | Open or Closed Transport Vehicle | Open (flat-bed)                        | Closed Transport Vehicle                      |
| Package Limits:   | External Surface                            | 2 mSv/h (200 mrem/h)             | 2 mSv/h (200 mrem/h)                   | 10 mSv/h (1000 mrem/h)                        |
|   | Transport Index (TI) <sup>2</sup>           | 10                               | No limit                               |   |
|   | Criticality Safety Index (CSI) <sup>5</sup> | 50                               | No limit                               |   |
| Transport Vehicle Limits (highway and rail):                        | Any point on the outer surface              | N/A                              | N/A                                    | 2 mSv/h (200 mrem/h)                          |
|   | Vertical planes projected from outer edges  |                                  | 2 mSv/h (200 mrem/h)                   | N/A   |
|   | Top of                                      |                                  | Load: 2 mSv/h (200 mrem/h)             | Vehicle: 2 mSv/h (200 mrem/h)                 |
|   | 2 meters from                               |                                  | Vertical Planes: 0.1 mSv/h (10 mrem/h) | Outer Lateral Surfaces: 0.1 mSv/h (10 mrem/h) |
|   | Underside                                   |                                  | 2 mSv/h (200 mrem/h)                   |   |
|   | Occupied position                           |                                  | N/A <sup>3</sup>                       | 0.02 mSv/h (2 mrem/h) <sup>4</sup>            |
|   | Sum of package TIs                          | 50                               | No limit                               |   |
|   | Sum of package CSIs <sup>5,6</sup>          | 50                               | 100                                    |   |



# Medical Services Hospital Program (MS-1)



October 26, 2012

# MS-1 Program Manager

**Victor Wilson**

*MS-1 Program Coordinator*

**Bureau of Planning & Preparedness**

# Topics of Discussion

-  Training
-  Designated MS-1 Hospitals
-  Federal Drill Schedule

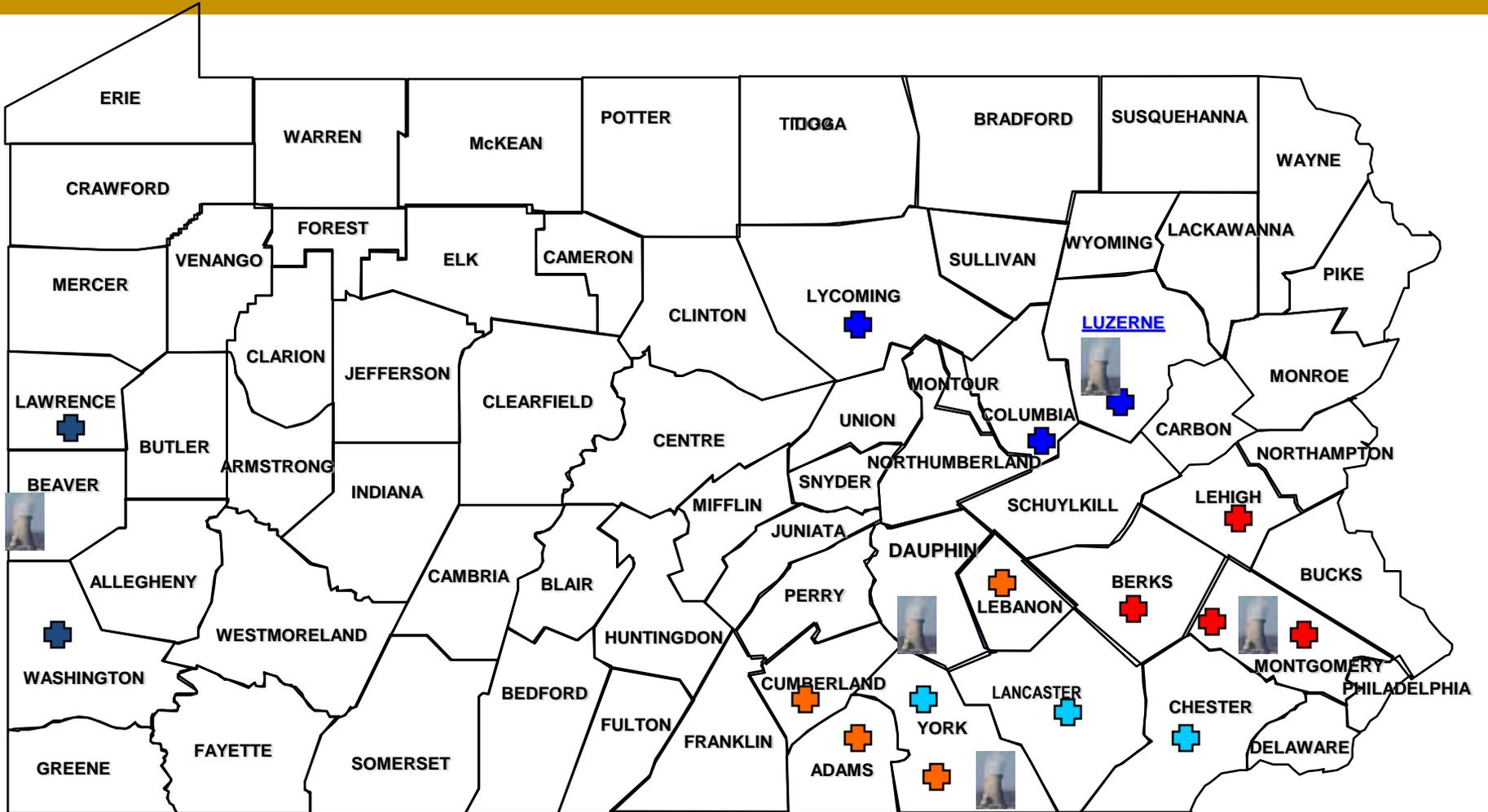
# Training

-  **Tetra Tech – Practical application training**
-  **2 three hour sessions for MS-1 hospitals**
-  **1 three hour session for EMS Staff**
-  **Annual PEMA evaluated exercise that simulates response to a Nuclear Power Plant Accident**

# Designated Hospitals

-  **16 Hospitals hold the MS-1 designation**
-  **All but one of the original hospitals are still in the program except one that left the program due to a consolidation/realignment**
-  **Each PEMA Planner assigned to a power plant is responsible for hospitals in their region**

# Medical Services Hospitals (MS-1)



+ BVPS   
 + LGS   
 + PBAPS   
 + SSES   
 + TMI

# Medical Services Hospitals (MS-1)

*Good Samaritan*

*Washington*

*Geisinger Wyoming*

*Carlisle Regional*

*Bloomsburg*

*Ephrata Community*

*Reading*

*Hanover General*

*Ellwood City*

*Lehigh Valley*

*Brandywine*

*Abington Memorial*

*Susquehanna Health*

*Gettysburg*

*Holy Redeemer*

*York*

# PEMA Drill Schedule

-  County, Utility, MS-1 Hospitals, Local EMS and PEMA work as a team to train, exercise and evaluate the response
-  Eight federally evaluated drills in 2016
-  Each hospital must have a Federally Evaluated MS-1 Hospital Exercise (every 2 years)

# 2016 Federal Drill Schedule

-  Good Samaritan Hospital
-  Reading Hospital
-  Hanover Hospital
-  Lehigh Valley Hospital
-  Carlisle Regional Medical Center
-  Abington Memorial Hospital
-  Gettysburg Hospital
-  Holy Redeemer Hospital



# Questions?

717-433-1227

[vicwilson@pa.gov](mailto:vicwilson@pa.gov)

Bureau of Planning and Preparedness

***Thank you and Please Stay Safe***

# Planning for Transportation of Commercial Spent Nuclear Fuel

Uldis Vanags, Project Director

Northeast High Level Radioactive Waste  
Transportation Project

# Northeast Task Force

- Assembled in 1995
- Representatives from 10 Northeast States from Maine to Delaware.
- Funded by DOE Cooperative Grants
- Managed by the Council of State Governments/Eastern Regional Conference located in Manhattan, NY

# Task Force Activities

- Develop and Coordinate transportation policy with the DOE, State Regional Groups, and Tribes.
- WIPP, Foreign shipments, and commercial spent nuclear fuel

# Northeast Task Force

- Hold at least 2 regional group meetings per year
- With one meeting at the National Transportation Stakeholder Forum annual meeting
- 2015 annual meeting was in Albuquerque, and 2016 annual meeting will be in Orlando

# What was the plan and what is it now?

## Started with the Atomic Energy Act of 1954

- Covers the laws for development, regulation, and disposal of nuclear materials and facilities

- Nothing done with disposal of spent nuclear fuel for 40 years
- 1982 - Passage of the Nuclear Waste Policy Act
  - Called for Monitored Retrievable Storage
  - Repository for military and commercial high level radioactive waste
- 1987 – Amended Nuclear Waste Policy Act designated Yucca Mountain as site to be evaluated
- 1992 – President approved Yucca Mountain, Nevada vetoed, and Congress votes to override NV veto. Work on Yucca Mountain proceeds.
- President Obama stops licensing process for Yucca Mountain and program is not funded
- 2010 – President Obama appoints Blue Ribbon Commission (BRC) on America's Nuclear Future to review how to manage the nations high level radioactive waste

# Blue Ribbon Commission

Recommendations: **New Legislation will be Required!**

- Establish a new facility siting process – consent base process
- Authorizing Consolidated Interim Storage Facilities
- Establishing a new waste management organization
- Ensuring access to dedicated funding
- Promoting international engagement to support safe and secure waste management

## Most Relevant BRC Recommendation

- Prompt efforts to prepare for the eventual large-scale transport of used nuclear fuel and high-level waste to consolidated storage and disposal facilities when such facilities become available.

# 2013 Administrations Strategy to Implement BRC Recommendations

- Have a pilot interim storage facility operational by 2021 – accept used nuclear fuel from shut-down reactors first.
- Site a larger interim storage facility by 2025 to accept enough used nuclear fuel to reduce expected government liabilities.
- Have one or more geologic repositories operational by 2048.

# Legislation is needed

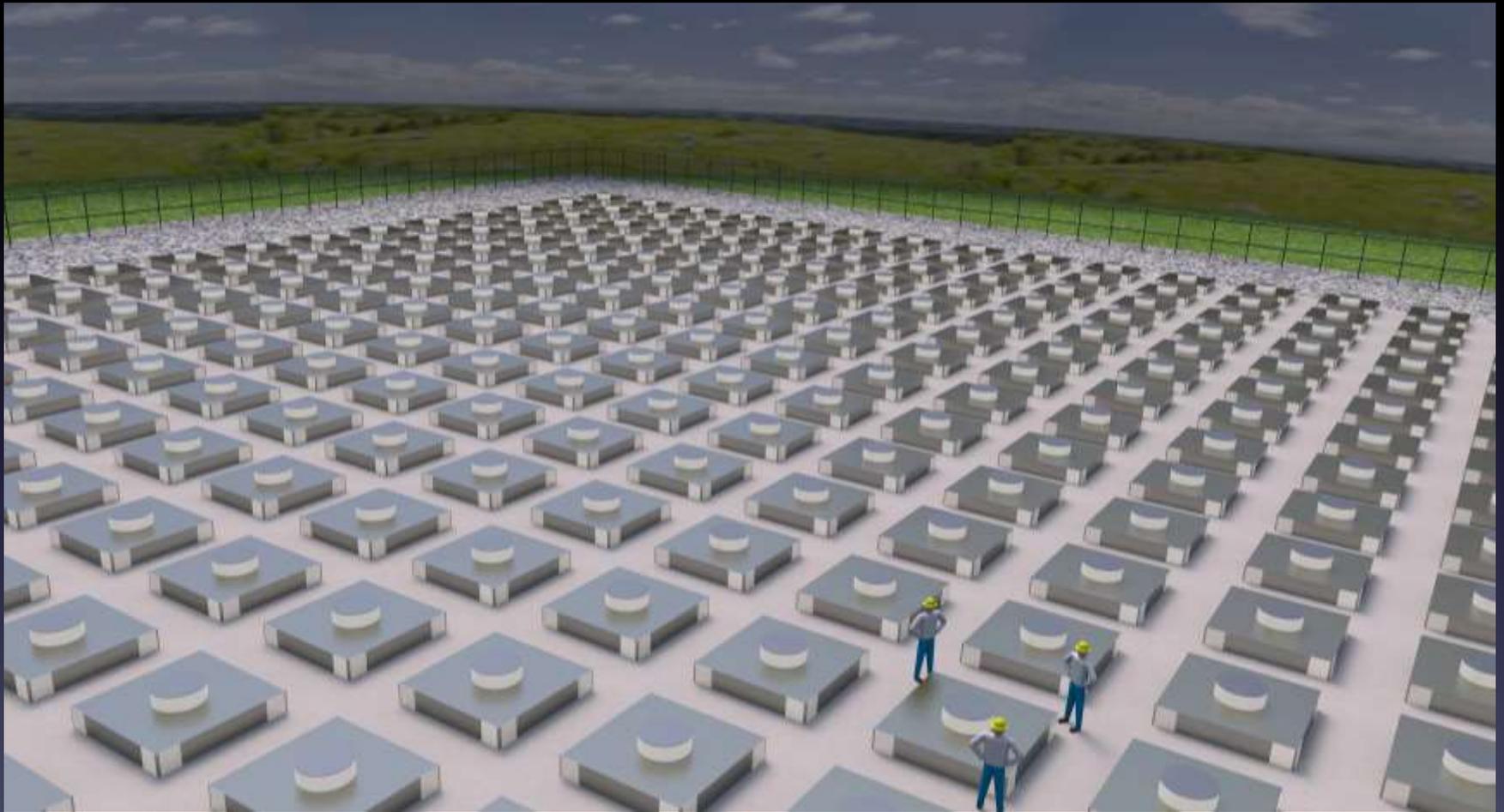
But, two entities in the Southwest have proposed building an Interim Spent Fuel Storage Facility

- Waste Control Specialist in western Texas
- Eddy Lea Energy Alliance in New Mexico

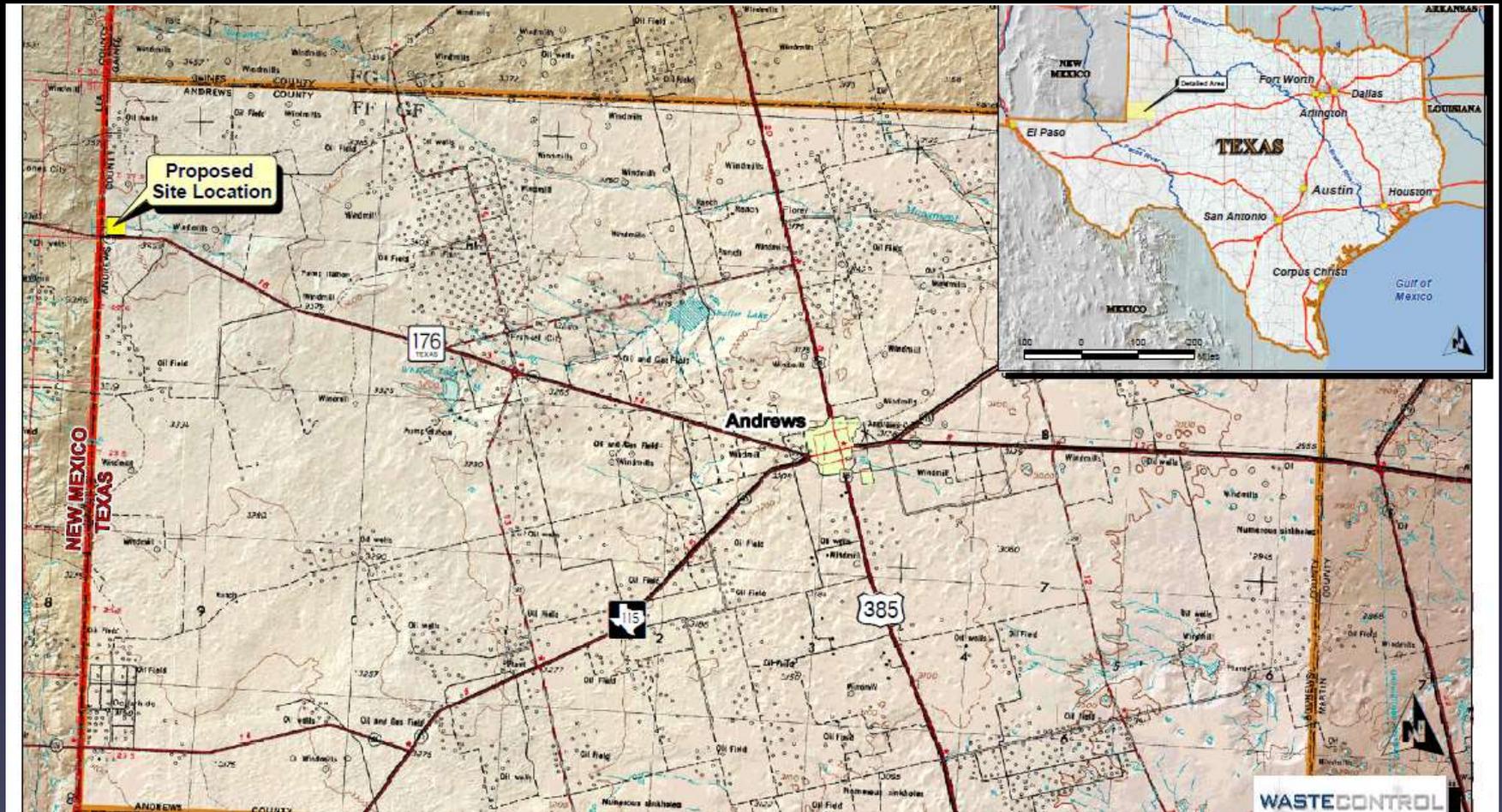
# Eddy Lea Energy Alliance



# Eddy Lea Energy Alliance Concept



# WCS – Andrews, TX



# WCS-Compact LLW Facility



# WCS- Federal LLW Facility



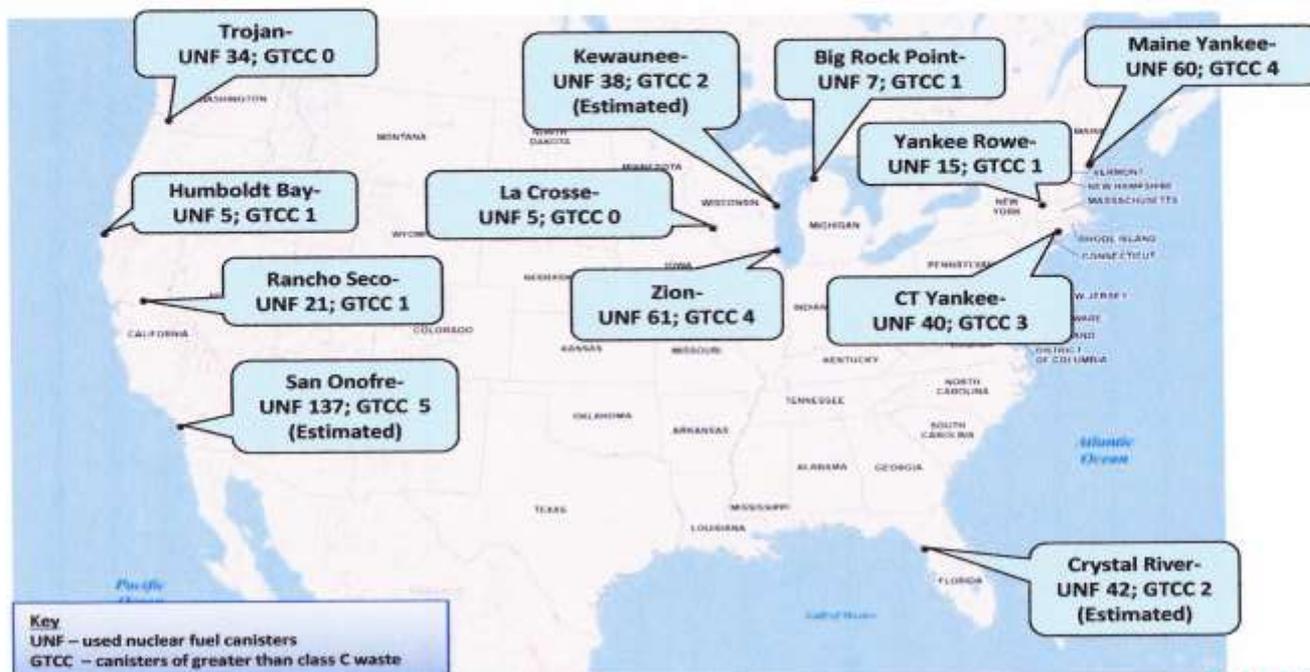
# WCS-Concept





## Locations of 12 Shutdown Reactor Sites

### ■ Nine Storage System Types and Eight Different Transportation Cask Designs at Shutdown Sites





# Where we are today

- **Destination is currently uncertain**
- **Transportation capability is needed regardless of destination**
- **Long-lead time activities are destination independent**
  - Compliant railcars will take 7+ years for development and approval





## Compliant railcars

### ■ Design and testing necessary to develop compliant railcars will take 7+ years

- Current contract is for cask and buffer car designs and broken into 3 phases
  - Mobilization and Conceptual Design – August 11, 2016
  - Preliminary Design – March 16, 2017
  - Prototype Fabrication and Delivery – March 20, 2019
- Follow on contract needed for testing and AAR approval
  - Anticipate *Conditional Approval* in 2022
- NFST is considering options for the escort railcar design

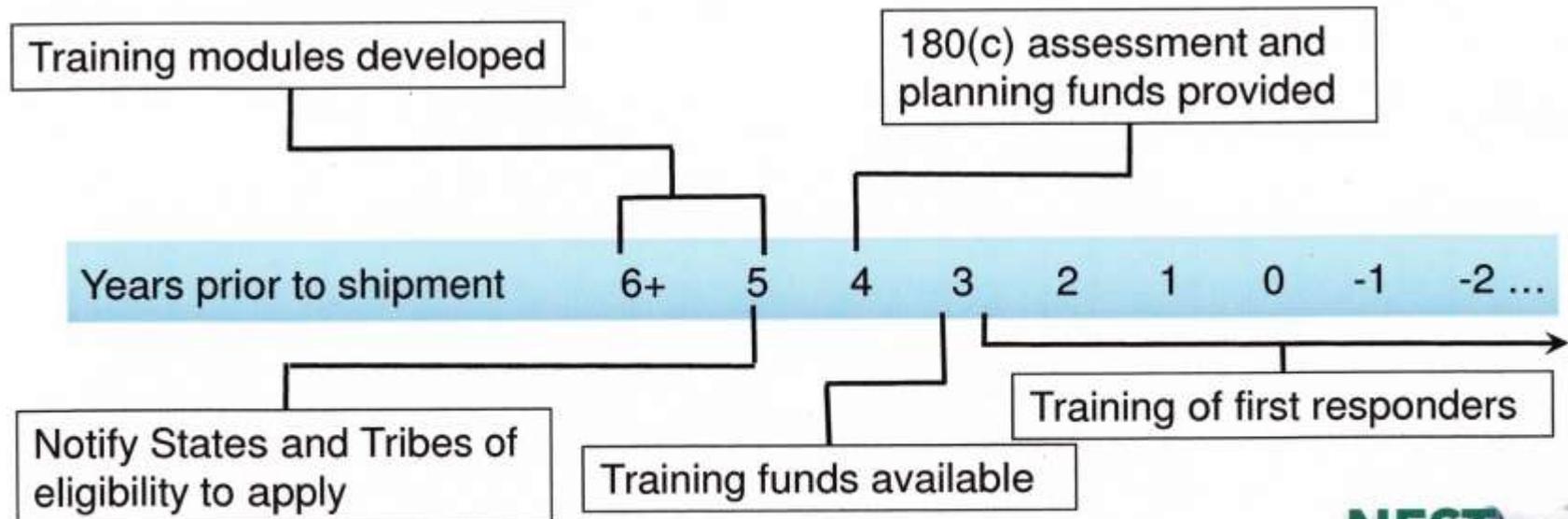




## Training

### ■ Training of public safety officials of units of local governments and Indian tribes is needed before shipments begin

- Section 180(c) calls for financial and technical assistance to states and Tribes for training public safety officials in preparation for transportation of SNF and HLW through their jurisdictions to a NWPA-authorized facility
  - 2008 Federal Register Notice



In summary, even though there presently is no destination for spent nuclear fuel, we can continue to plan for safe transportation and build regional and tribal understanding of the diverse issues.

Questions?