

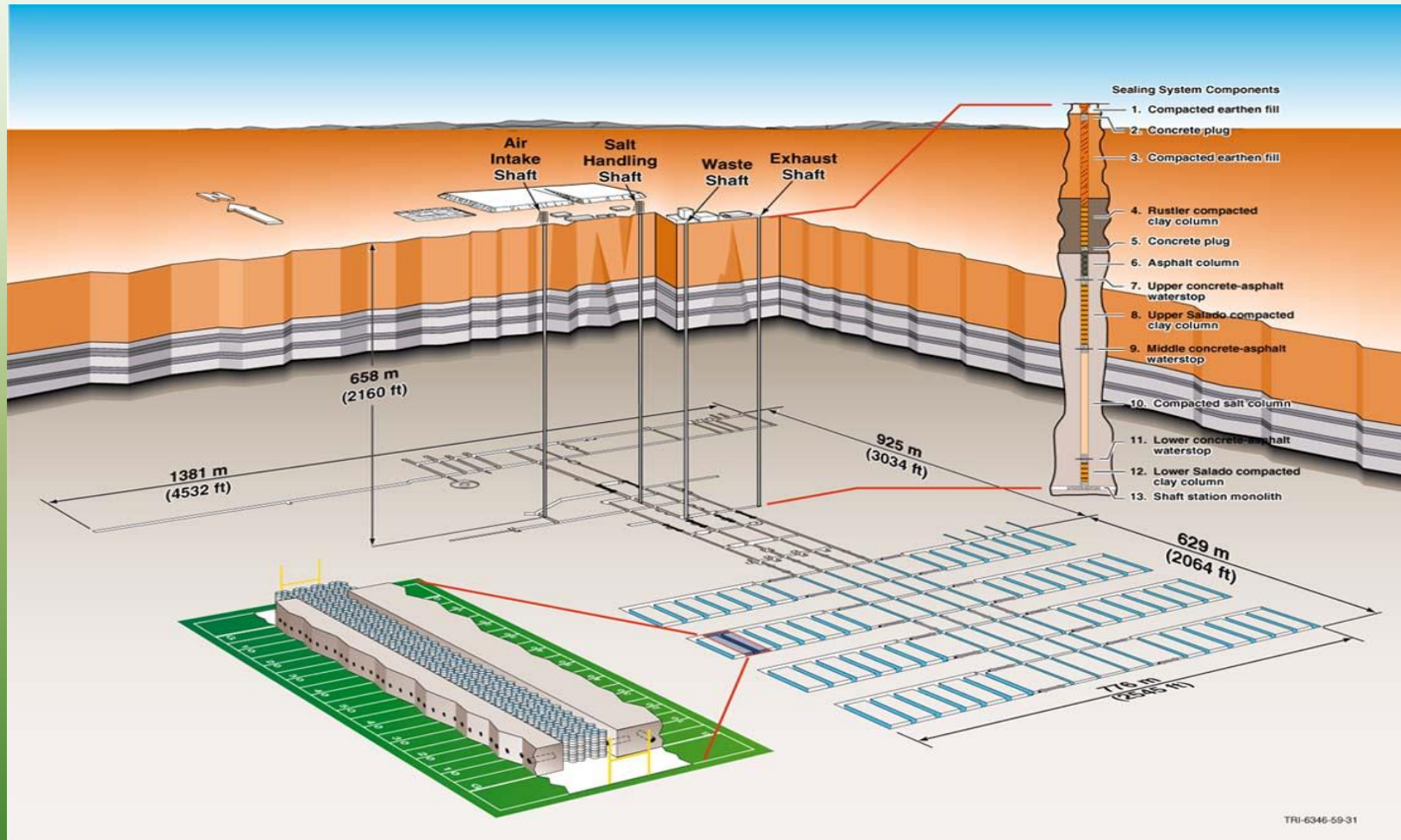
# Waste Isolation Pilot Plant (WIPP) Recovery Overview



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EPA Region 6



# WIPP Background



## Regulatory Allowed Capacity

CH – 168,460 m<sup>3</sup>

RH – 7,080 m<sup>3</sup>



# WIPP Background

- Defense TRU waste, dominated by plutonium and americium
- Contact Handled (CH) - less than 200 mR/hr (2 mSv/hr) at container surface
- Remote Handled (RH) - greater than 200 mR/hr (2 mSv/hr) at container surface, usually strontium and cesium
- Repository in bedded salt formation at 2150 feet (650 m)
- Waste Emplacement as of the incident
  - 11,894 Shipments of TRU Waste by truck
  - 90,627 m<sup>3</sup> of CH disposed
  - 357 m<sup>3</sup> of RH waste disposed



# Oversight at WIPP

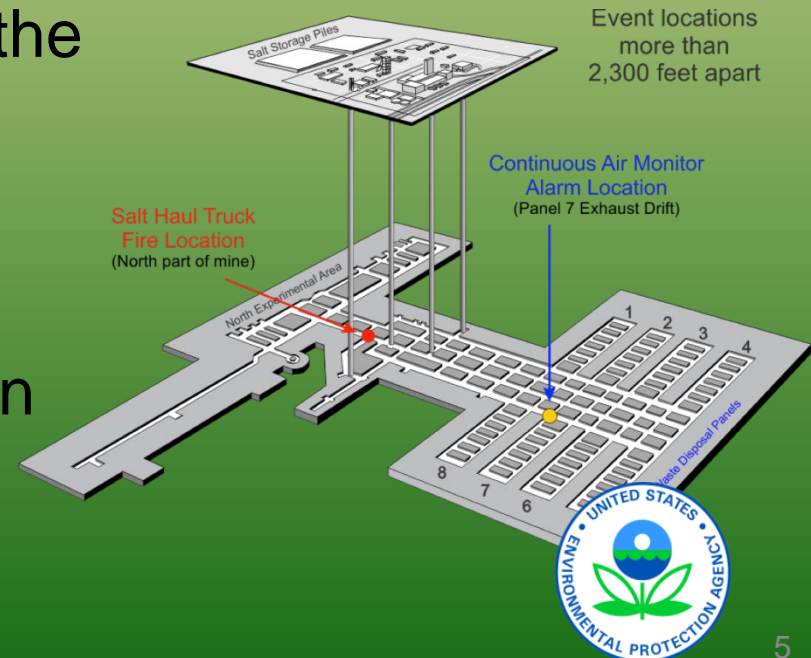
- New Mexico Environment Department (NMED) has a RCRA permit in effect. New Mexico is authorized for RCRA, CWA, and CAA if applicable.
- EPA under the Land Withdrawal Act certifies WIPP is compliant to contain radiation for 10,000 years (via computer model) after final facility closure. Re-certifications occur every 5 years.
- EPA limits dose to the public from WIPP operations
  - 25 mR/year under disposal regulations, but only during operational period.
  - 10 mR/year under CAA NESHAPs

Other applicable requirements for workers and the public are regulated by Mine Safety and Health Administration and DOE Occupational Radiation Safety.



# Mine Vehicle Fire February 5, 2014

- A diesel underground vehicle caught fire near the salt handling shaft. The vehicle was moving salt out of the mine and there was no waste activity.
- Underground was evacuated and the fire put out. Operations were suspended after the fire to allow investigation.
- Fire was not related to the radiation release nine days later.



# Radiation Release February 14, 2014

- Underground Continuous Air Monitor (CAM) alarmed at 11:15pm; no one in the underground.
- Mine ventilation automatically switched from 270,000 CFM to 60,000 CFM through HEPA filtration in about a minute.
- Americium, Plutonium, and Uranium measured at the exhaust vent with total estimated release of 2 mCi to the outside environment.
- Wind gusting to 20 mph to the northwest.

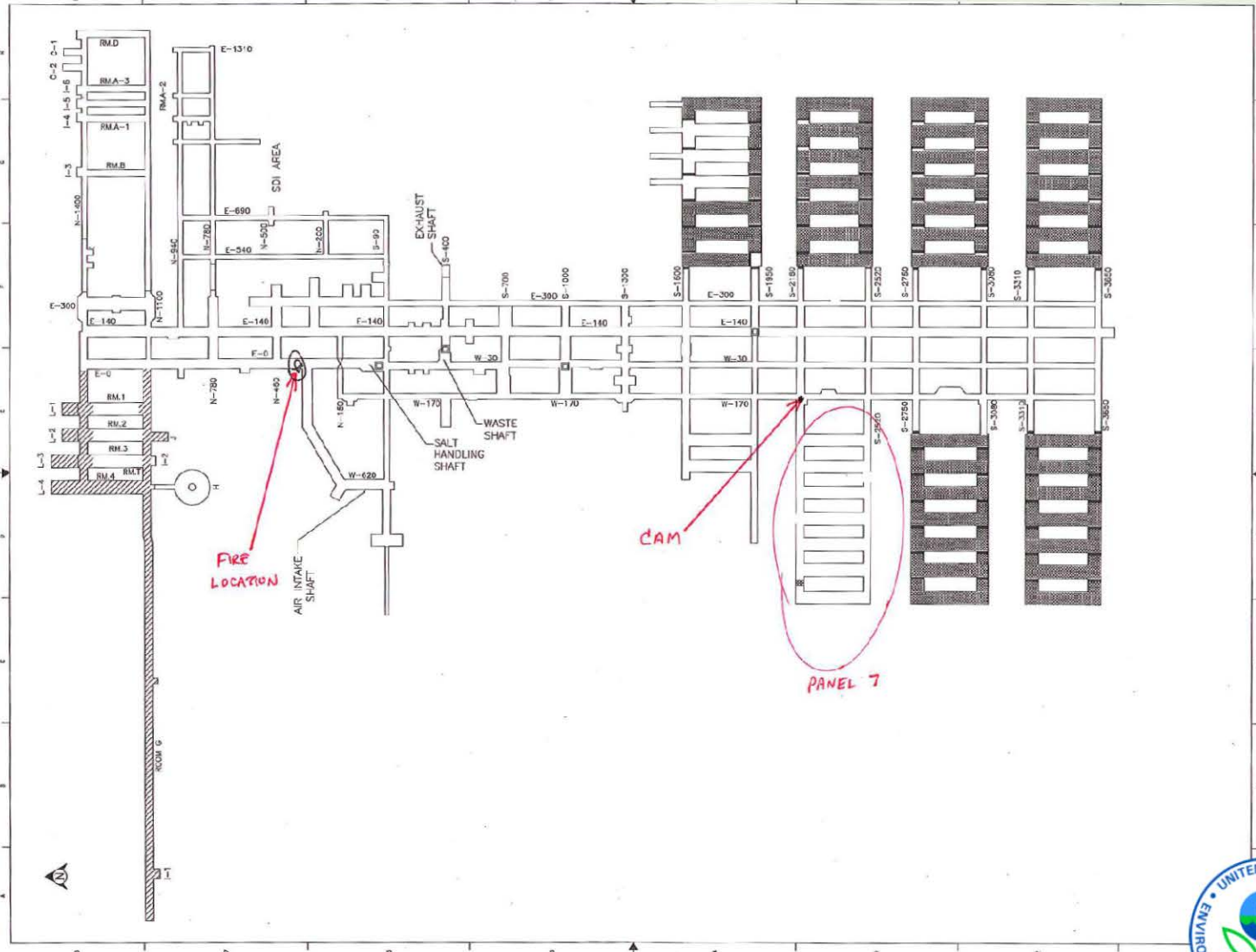


# Radiation Release - continued

- One air sampler (WIPP Far Field) measured Am and Pu just above background 0.6 miles to the northwest.
- No contamination found on grounds or on outside structures.
- Bioassay tests run on employees that were on site the 14<sup>th</sup> and 15<sup>th</sup>. Some positive measurements with no significant dose to any employee.



# Location of Radiation Release





# Panel 7 - Room 7 Prior to Event



Panel dimensions ~ 100  
m x 20 m x 4 m



# Panel 7 – Room 7 After the Event

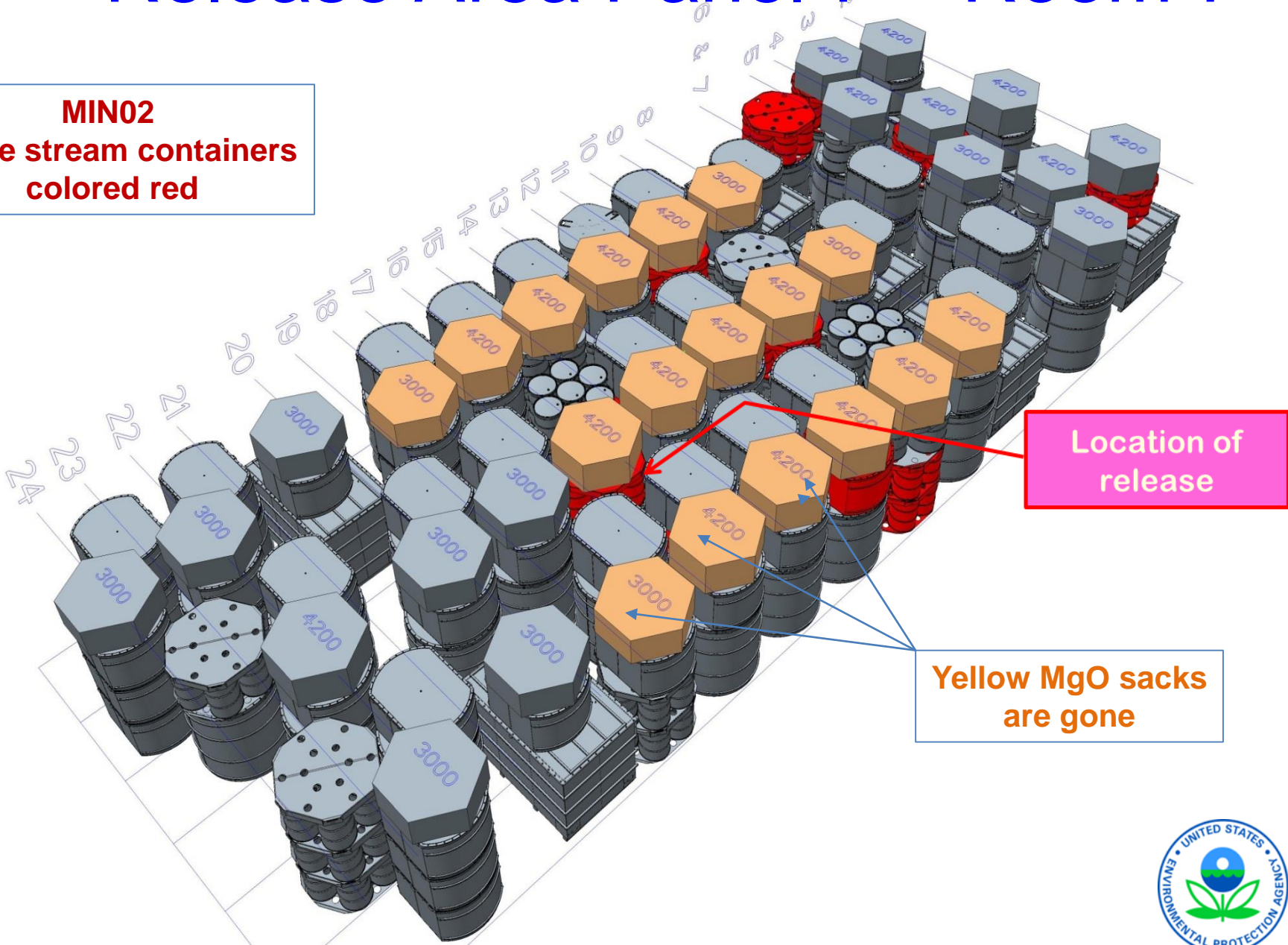


# Lid displaced on MIN02 Drum



# Release Area Panel 7 – Room 7

**MIN02**  
waste stream containers  
colored red



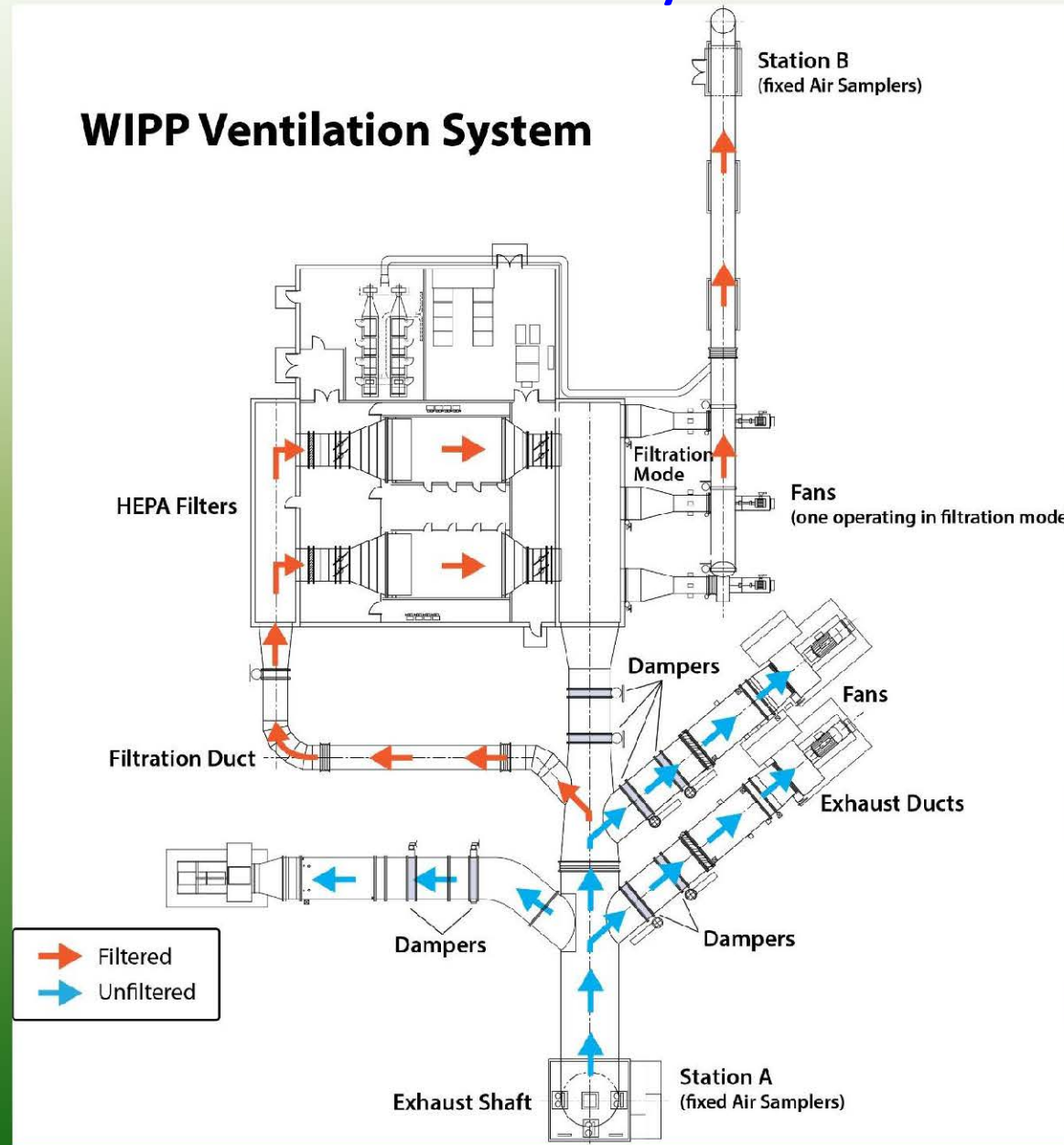
Location of release

Yellow MgO sacks are gone



# Ventilation System

## WIPP Ventilation System



# DOE Response

- WIPP operations suspended indefinitely. Site restricted to “essential personnel only” until 4/23/14.
- Air monitors sampled every 8 hours and additional air monitors added around the site – One reading above background approximately ½ mile northwest of exhaust shaft. No significant hits after the event.
- Bioassay samples taken from workers with analysis confirmed by CDC – no significant dose.
- Whole Body counts taken of all employees with potential for exposure – no significant dose.



# DOE Response - continued

- Grounds around site surveyed and swipes taken from on-site structures – nothing significant.
- Soil samples taken across estimated plume path – nothing significant.
- Water and vegetation samples taken around site and within estimated plume – nothing significant.
- Regular conference calls with regulators (EPA and NMED).
- Regular Town Hall meeting with citizens and elected leaders in Carlsbad, NM.



# EPA Actions

## Review DOE's Data & Analysis

- Data Analysis/Review
- Public Dose & Dispersion Modeling

## EPA Verification/Review Of DOE Air Monitoring

- Independent EPA Air Monitoring
- Evaluation Of DOE's Environmental Monitoring System

## Oversight At WIPP

- On-site Recovery Inspection April 2014
- Conference Calls with regulators first weekly, then monthly
- Recovery Inspection April 2015





# EPA Actions - continued

## EPA Communications

- Conference calls with DOE, NMED, ORIA, CBFO, LANL, and GAO.
- R6 Health Physicist traveled to Carlsbad to support NMED and participate in the Town Hall meetings.

## More Information at:

[www.epa.gov/radiation/docs/wipp/2014\\_radevent/wipp\\_epaactions\\_2014\\_release.pdf](http://www.epa.gov/radiation/docs/wipp/2014_radevent/wipp_epaactions_2014_release.pdf)



# Expansion Beyond WIPP

- DOE determined that incompatible chemicals in the MIN02 waste stream caused an energetic reaction in a single drum.
- Waste containers suspended from shipment are temporarily stored at WIPP, Waste Control Specialists (WCS), and Los Alamos National Laboratory (LANL).
- Containers of MIN02 waste are monitored for temperature to assure no potential reactivity.



# Town Hall Meeting

## Regular Outreach Locally and Streamed to the Internet



# EPA Onsite to Confirm DOE Air Sampling



# EPA Inspects Recovery Operations



# Recommendations Currently in Progress

- Improvement of Monitoring Program.
- Improvement of Maintenance and Quality Assurance Program.
- Ventilation and Filtration system improvement and redesign.
- Improvement of Communication and Notification.
- Facility culture should focus on radiation safety and contamination control.

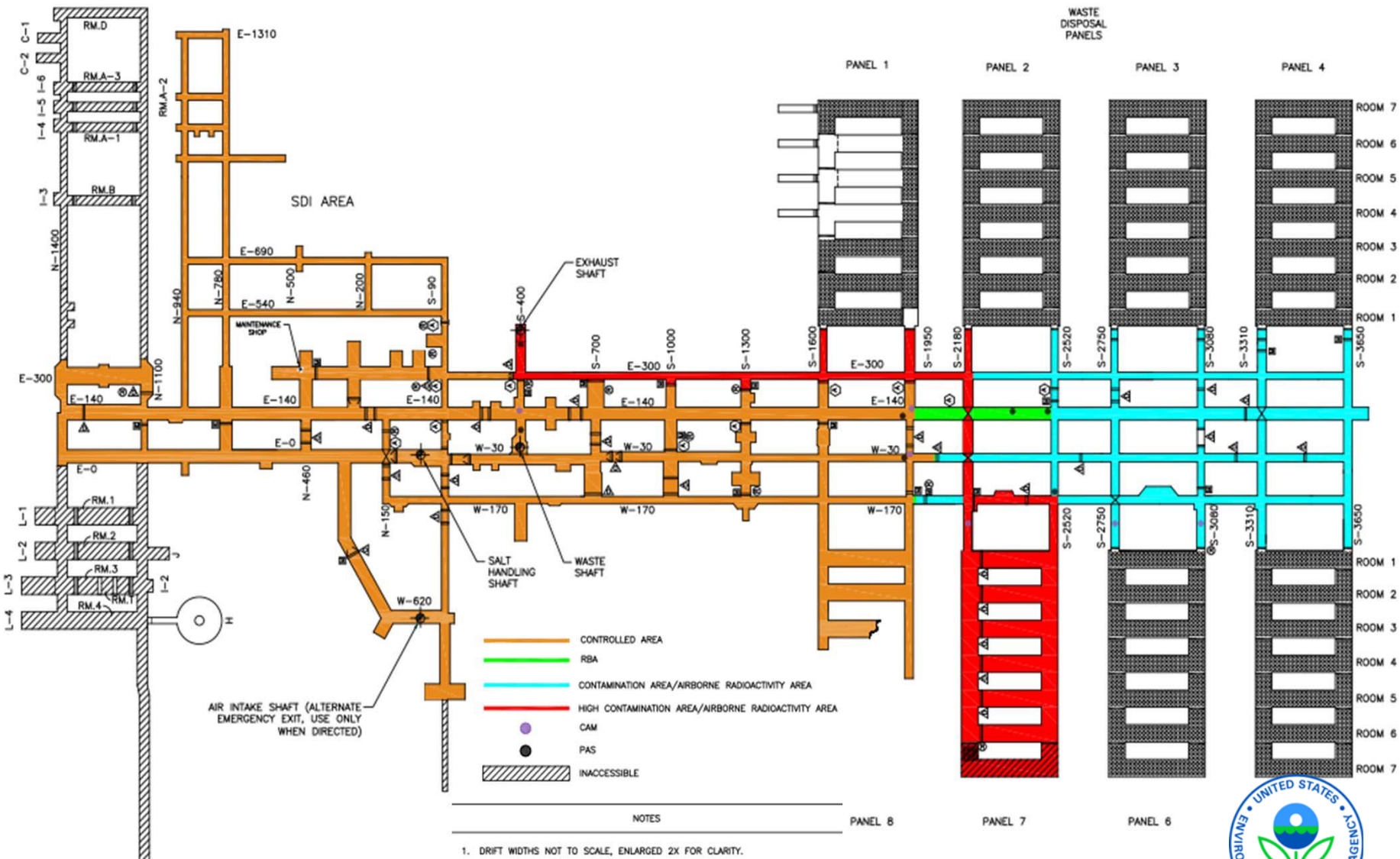


# Recovery

- Safety is the primary driver in all recovery operations.
- Increased ventilation is required to operate multiple pieces of equipment.
- Ground control maintenance and equipment maintenance must occur before decontamination.
- Potential reactive containers have been isolated.



# Recovery Map

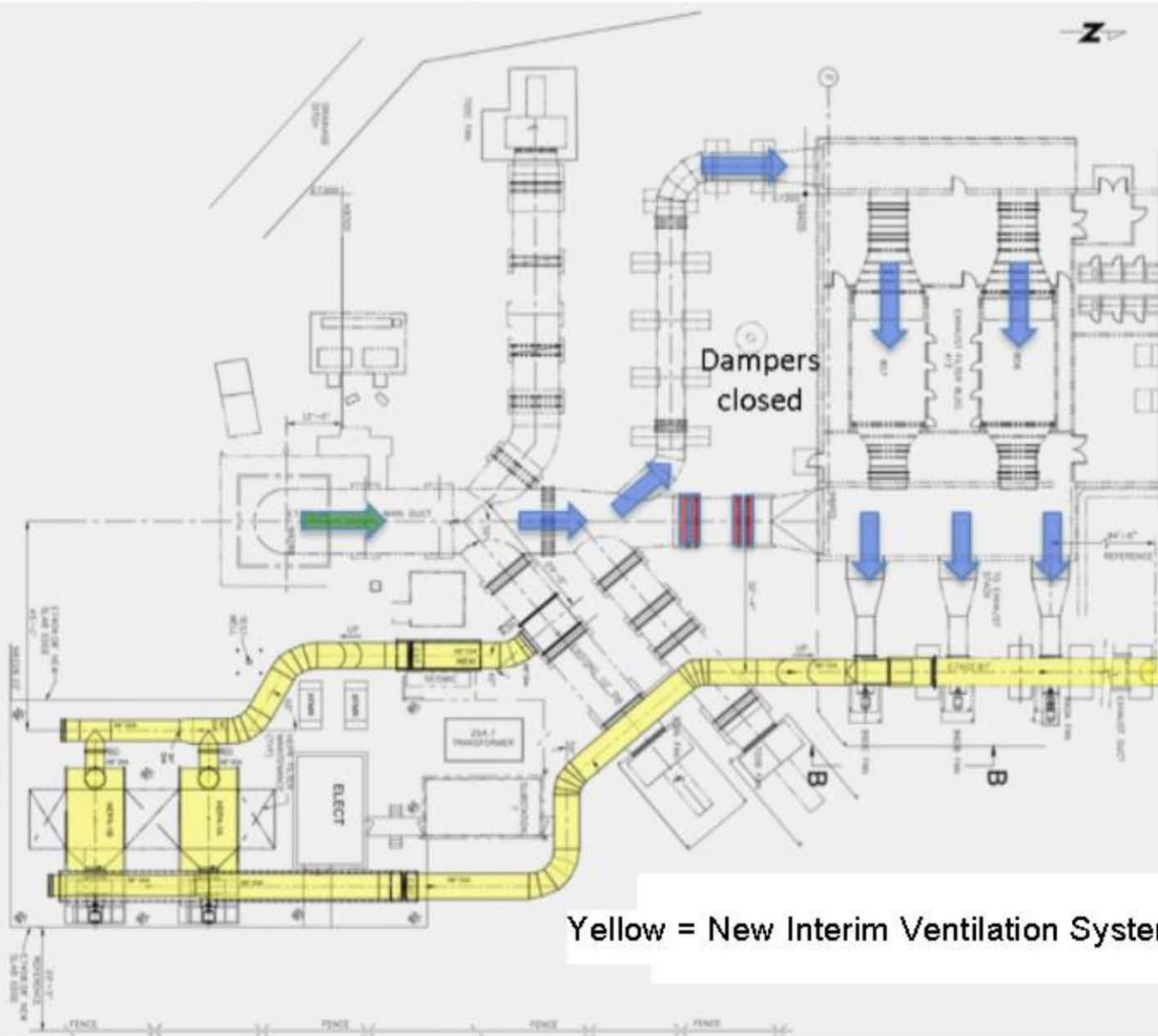


- NOTES
1. DRIFT WIDTHS NOT TO SCALE, ENLARGED 2X FOR CLARITY.
  2. EXISTING EXCAVATION REFLECTS STATUS AS OF 08/19/14.





# WIPP Ventilation



Yellow = New Interim Ventilation System



# Supplemental Ventilation



08.26.2015



# Recovery Progress

- Isolated Panel 6 – May 13, 2015.
- Isolated Room 7 of Panel 7 – May 29, 2015.
- Bolting ground control – Began November 2014 and ongoing.
- Monitoring exhaust and underground – Before the event and ongoing since the event.
- Decontamination – Began March 2015 and ongoing.
- Increased ventilation from 60,000 CFM to 180,000 CFM with Interim and Supplemental fan systems.



# Conclusions

- DOE's timely updates to its regulators, regular updates to its website, and regular Town Halls for the local community has proven to be a positive asset.
- Educating the public about a radiation release and the risk involved has been very difficult.



# Questions?

