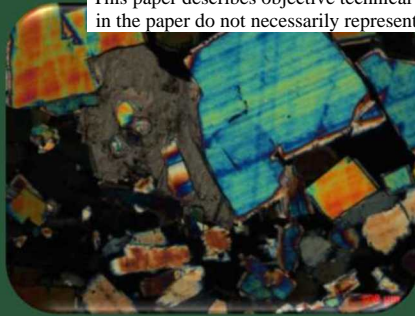
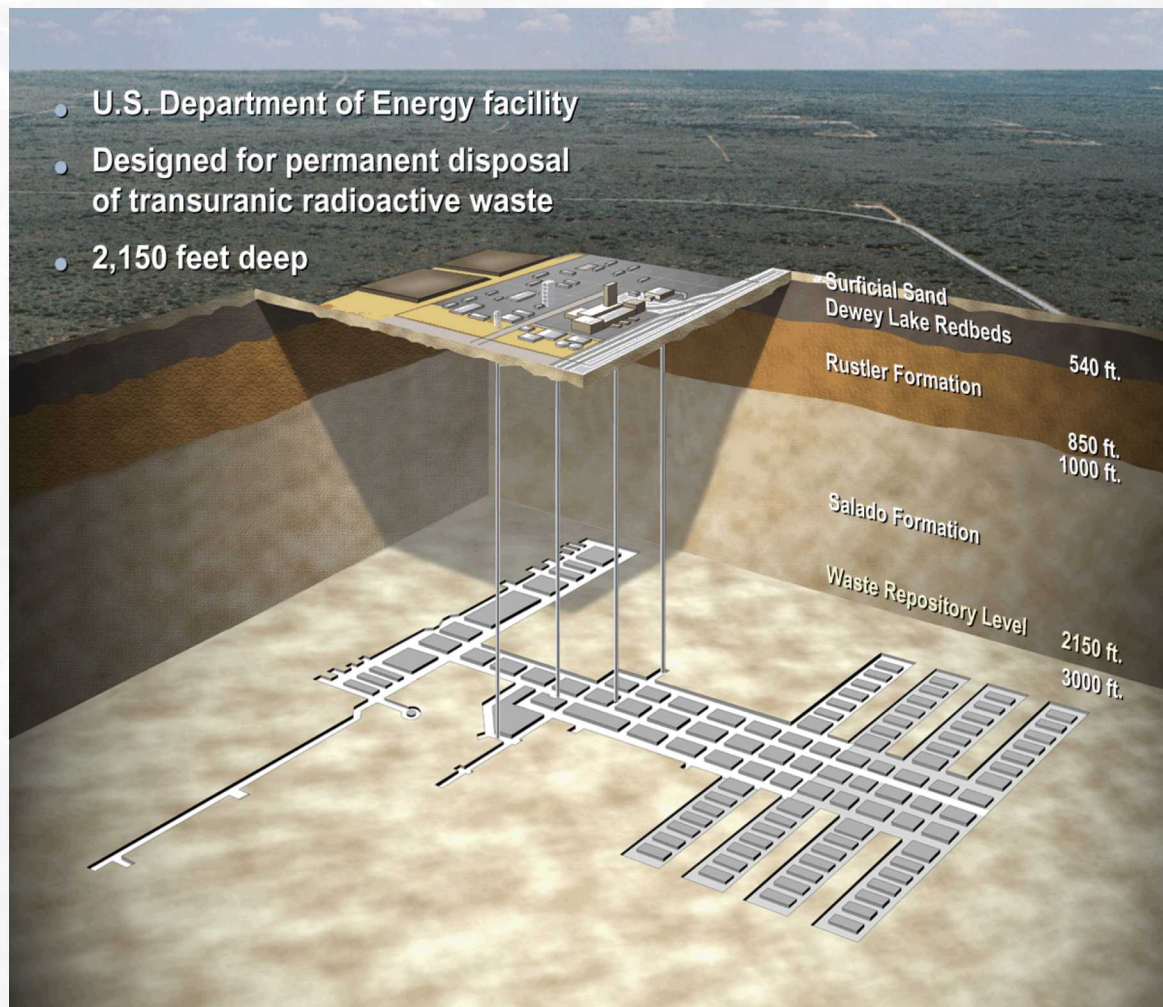


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Sandia National Laboratories is a multi-mission laboratory managed and operated by National Technology and Engineering Solutions of Sandia LLC, a wholly owned subsidiary of Honeywell International Inc. for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525. This research is funded by WIPP programs administered by the Office of Environmental Management (EM) of the U.S. Department of Energy.

Outline

- Recovery
- Ground Control Challenges
- Waste Emplacement
- Resumption of Shipments
- Mining Status
- Withdrawal from south end of mine
- Lessons Learned



WIPP Incidents

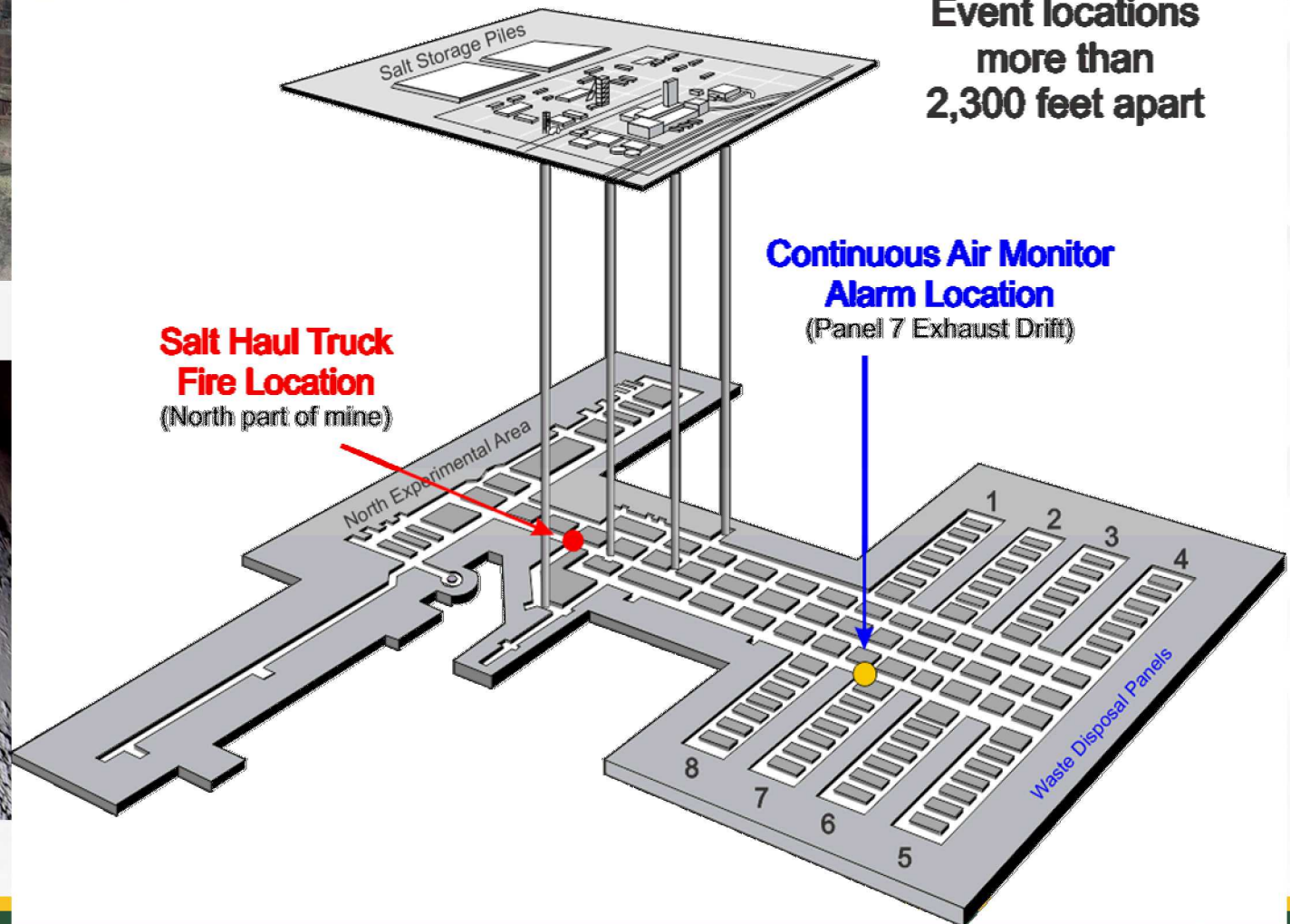
February 5, 2014 Truck Fire:

- All operations at the repository ceased following salt haul truck fire in the WIPP underground.
- An investigation team was deployed to determine the cause of the fire.

February 14, 2014 Radiological Incident:

- A continuous air monitor detected airborne radiation in the underground.
- WIPP's ventilation system automatically switched to high-efficiency particulate air (HEPA) filtration mode when airborne radiation was detected
- Underground and the WIPP mine remains in filtration mode at this time.
- Extensive sampling and monitoring conducted by DOE, New Mexico, and Carlsbad Environmental Monitoring Research Center
- Efforts by the DOE and Nuclear Waste Partnership are ensuring workers are fully protected during recovery and restart.

WIPP Incidents



Key Steps Toward Recovery

- Documented Safety Analysis Revisions
- Safety Management Program Revitalization
- Underground Restoration
 - Re-Establish Degraded Equipment
 - Fire Protection
 - Maintenance and Ground Control
 - Radiological Roll-back
 - Soot cleaning of electrical panels
- Expedite mine stability
- Initial Panel 6 and Panel 7, Room 7 Closure
- Interim Ventilation



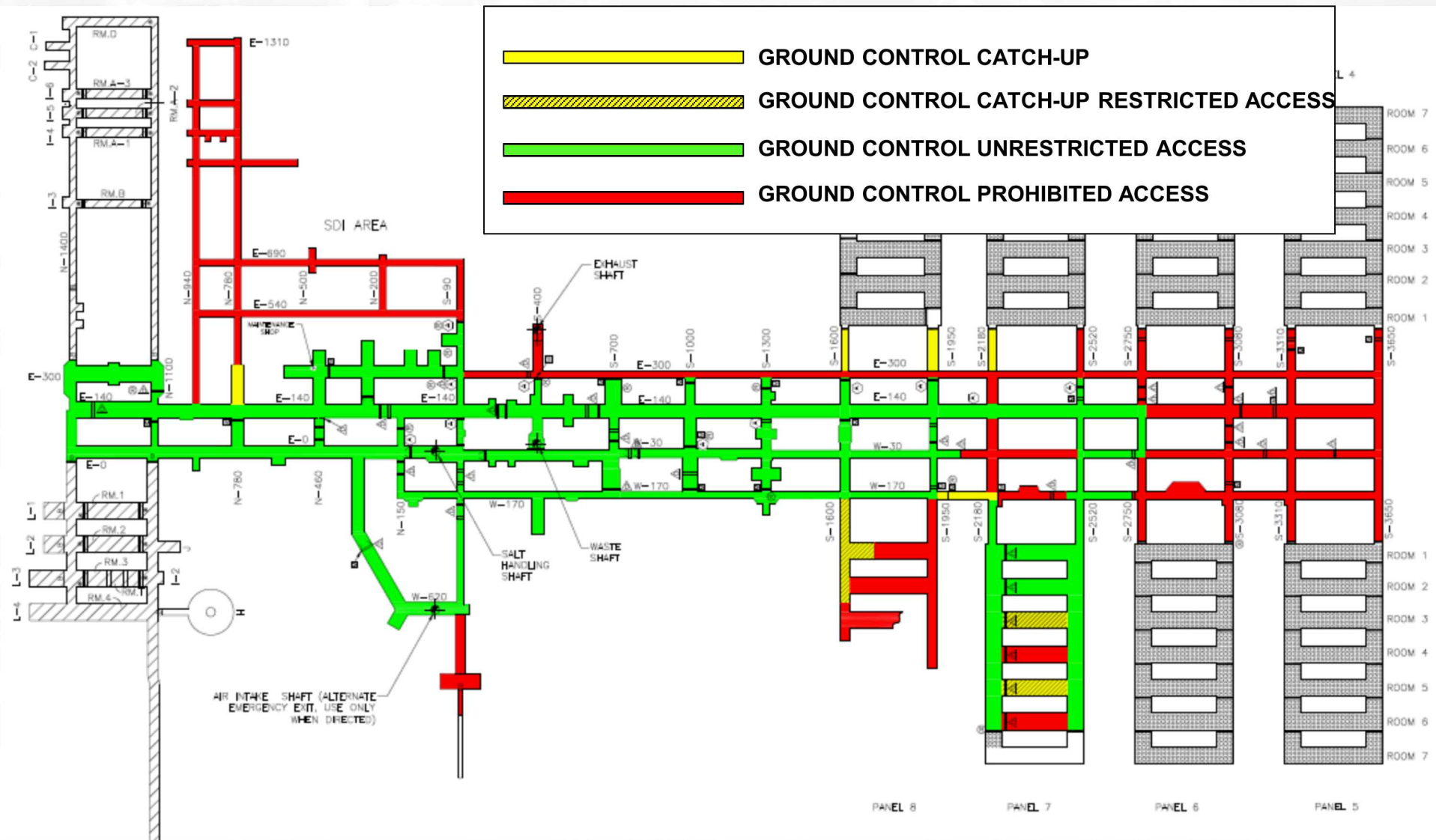
Ground Control Challenges

Limitations:

- 9 – months with no ground control following incidents
- Low ventilation rates limited bolting operations
- Need for workers to operate in personal protective clothing and respirators



Ground Control Status



Reopening



WIPP Officially Reopened with a ribbon cutting ceremony held on January 9, 2017

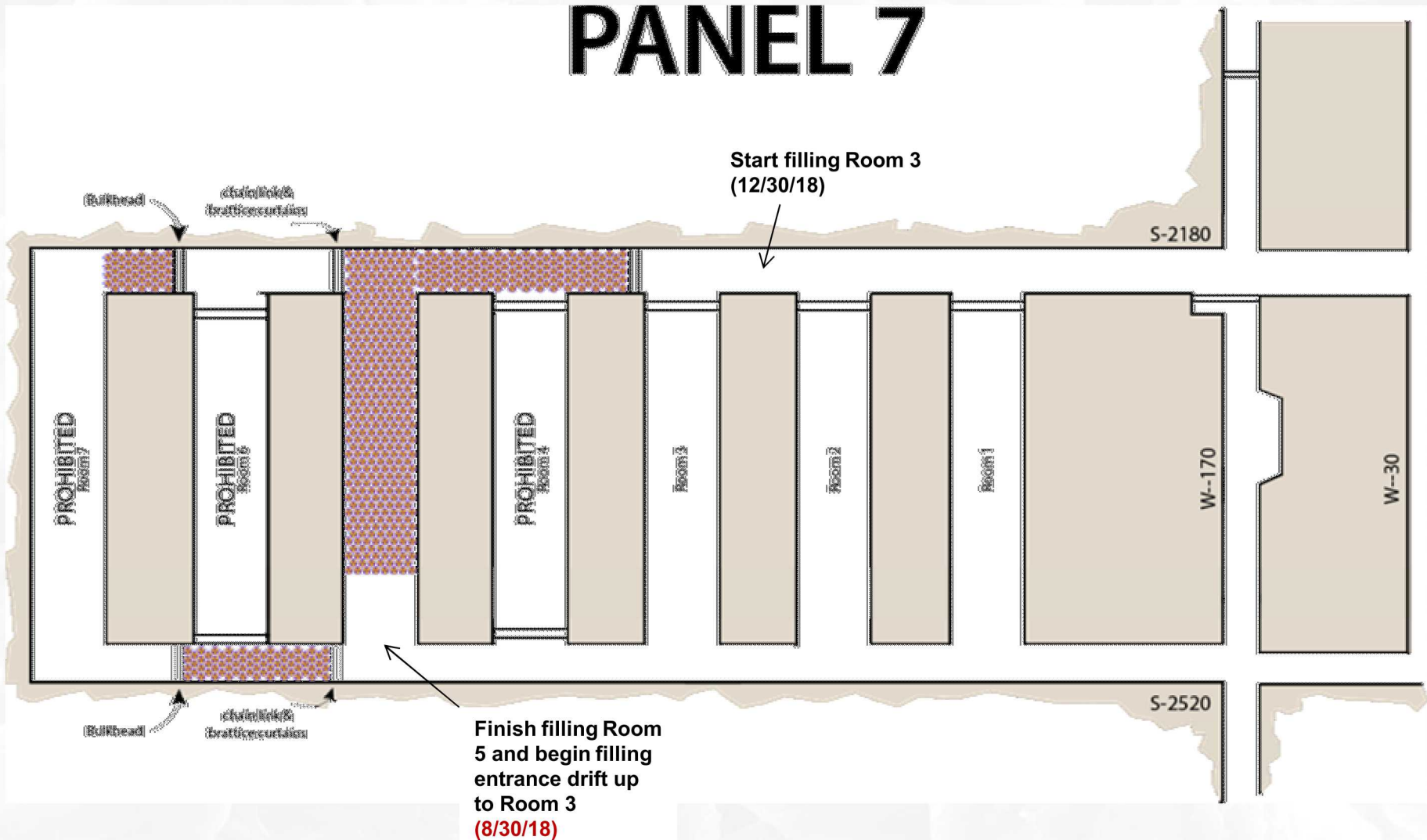
Waste Emplacement Resumes



- Waste emplacement operations resumed in Panel 7 – transition point between clean and contaminated area is necessary

Panel 7 Status

PANEL 7



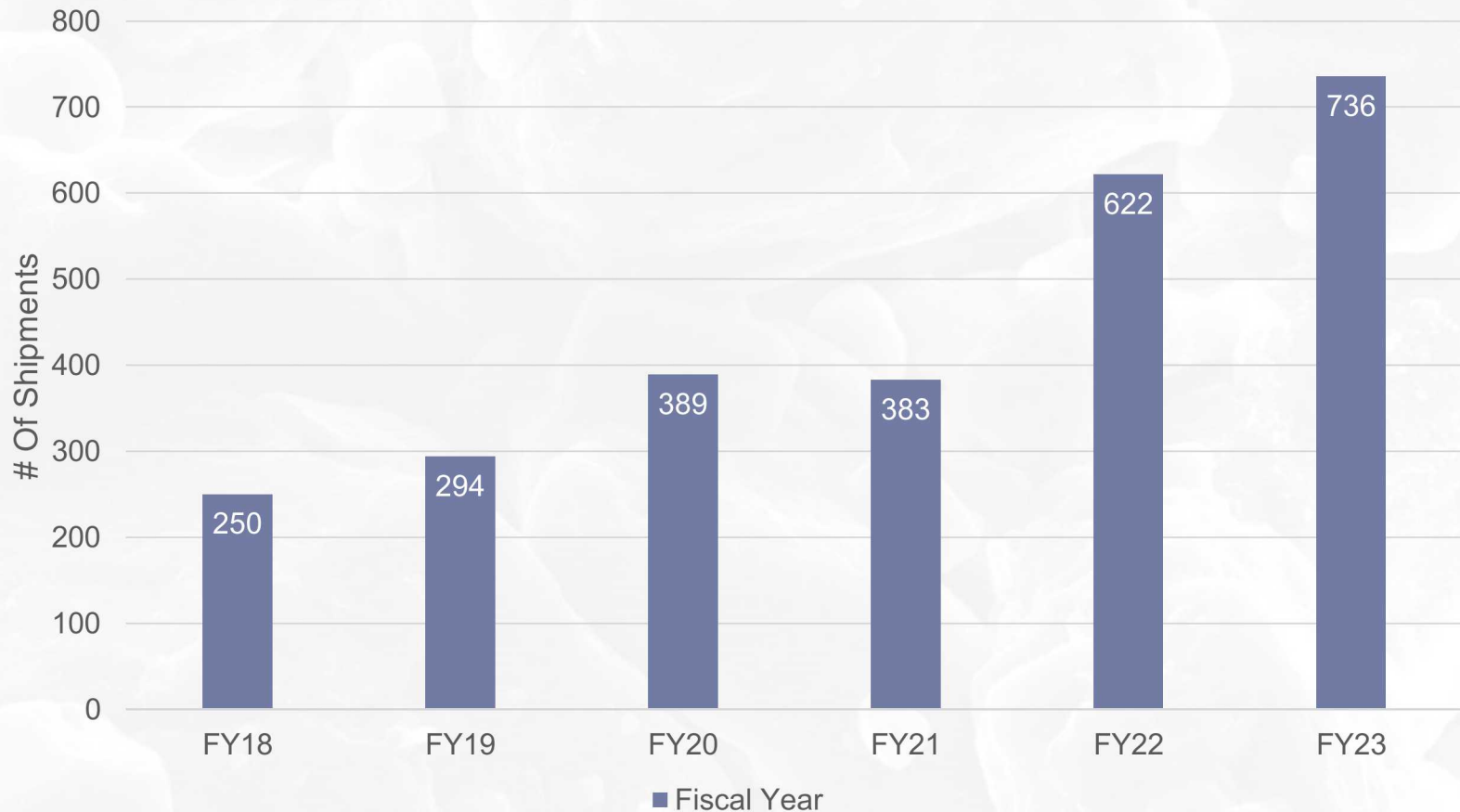
Shipments Resumed

- First shipment since incidents was received from Idaho in April 2017
- Total Shipments received (since 1999) – 12,214. Shipments since restart – 320
- Averaging 7-8 shipments/week, increasing to 8-10 shipments/week now
- WIPP anticipates receipt of approximately 128 shipments between April of 2017 and the end of January 2018



Projected Shipping

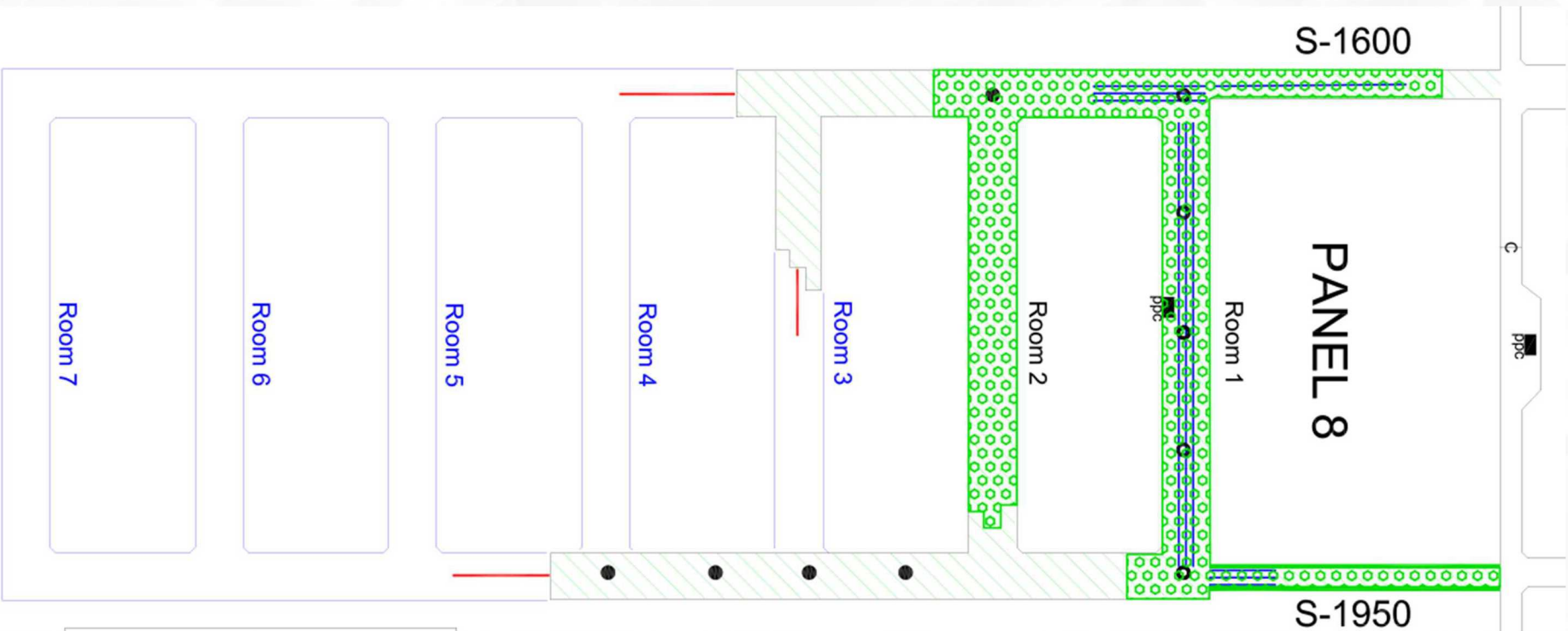
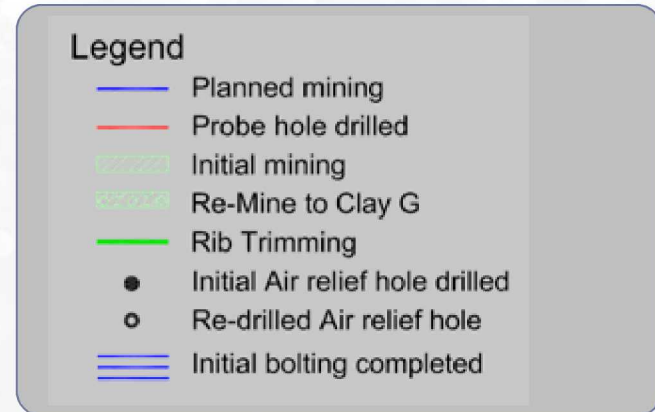
SHIPMENT PLANNING ASSUMPTION (FY18 – FY23)



Mining Panel 8

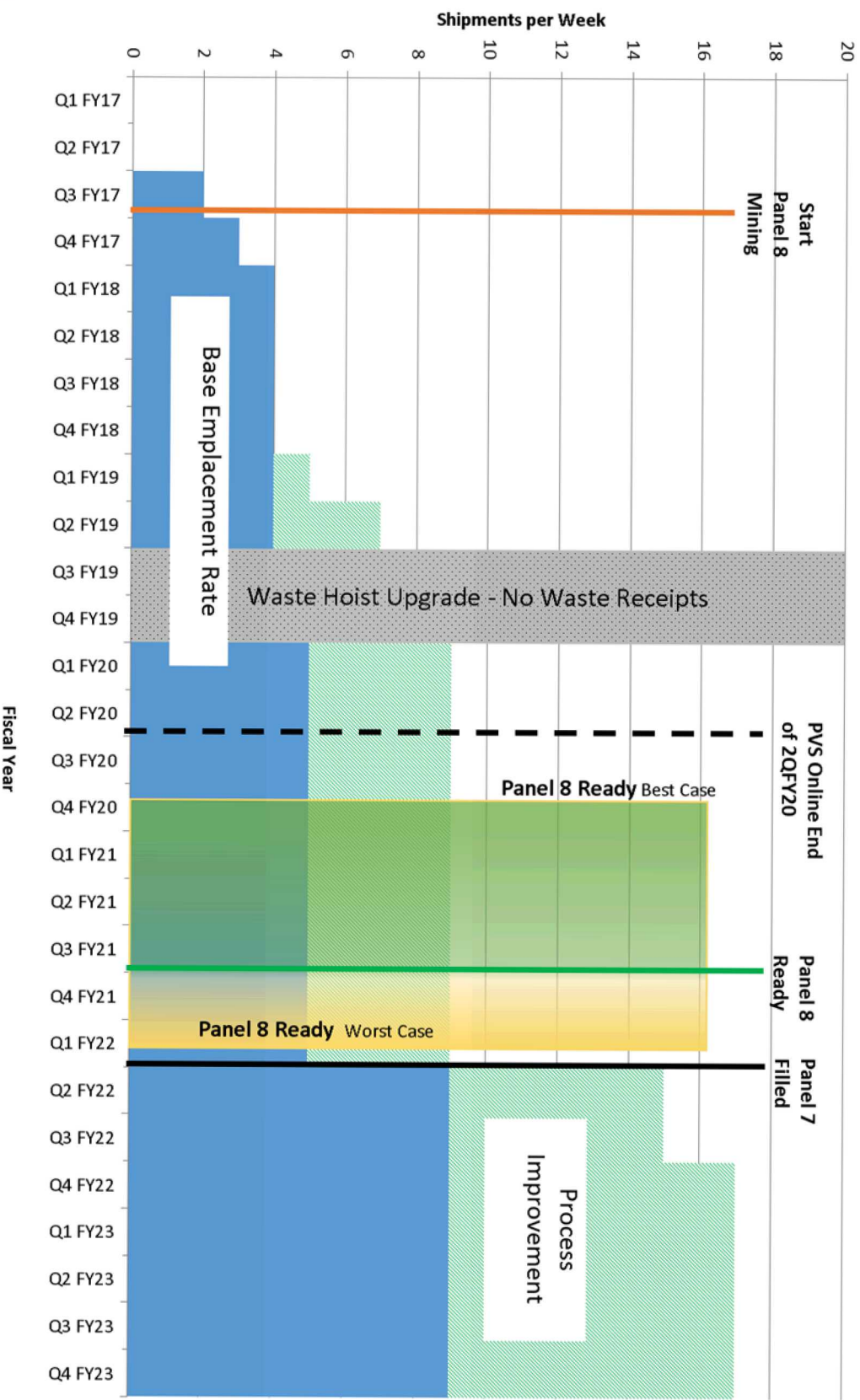
Mining of Panel 8:

- No contamination present
- Mining operations are expected to take approximately 3 years



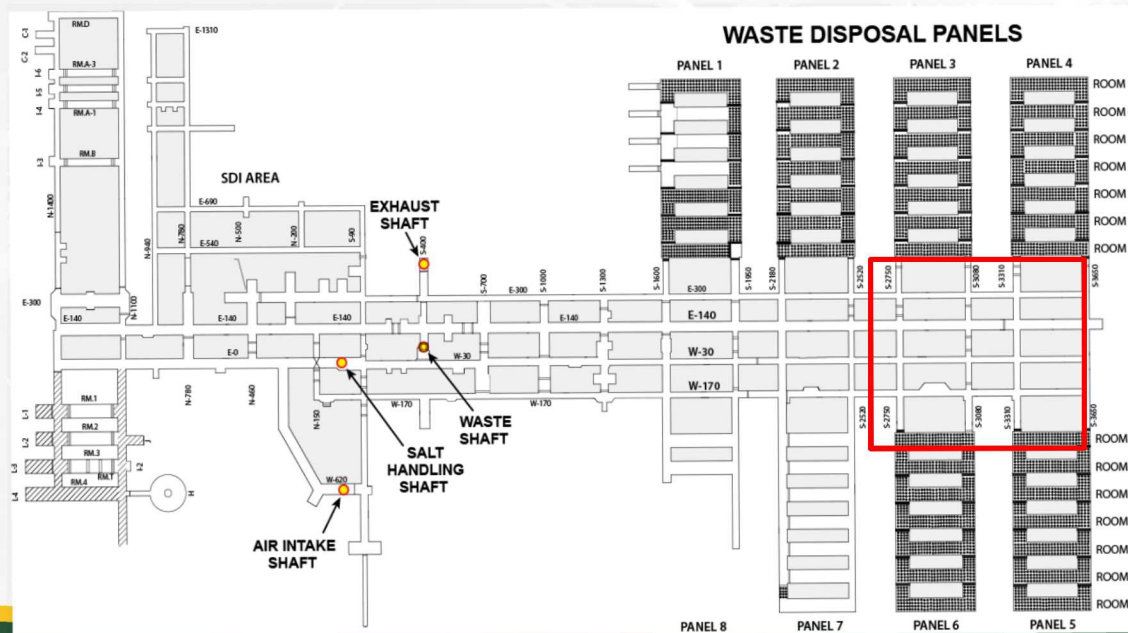
WIPP Mining and Emplacement Model

Waste Emplacement Rates FY17 - FY23

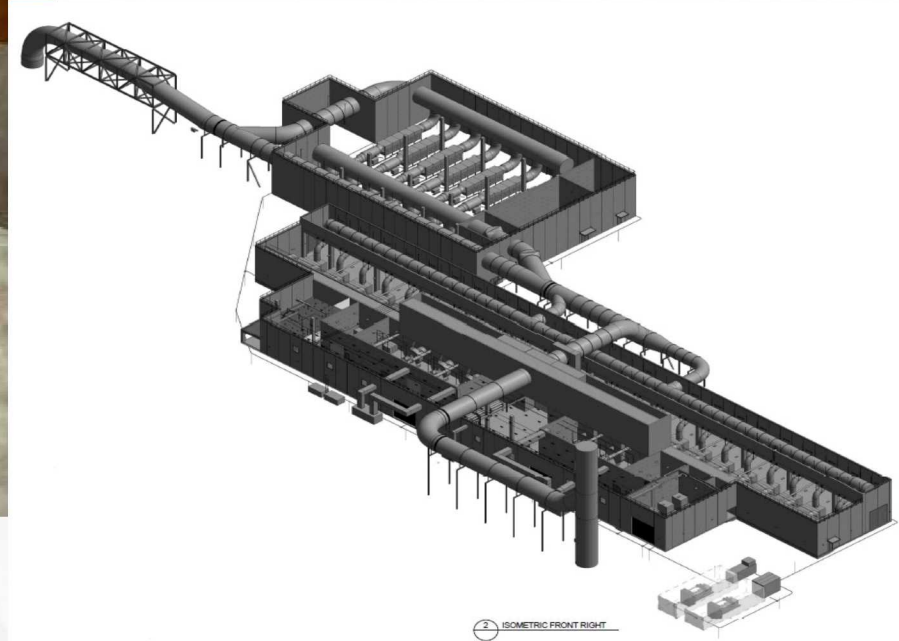
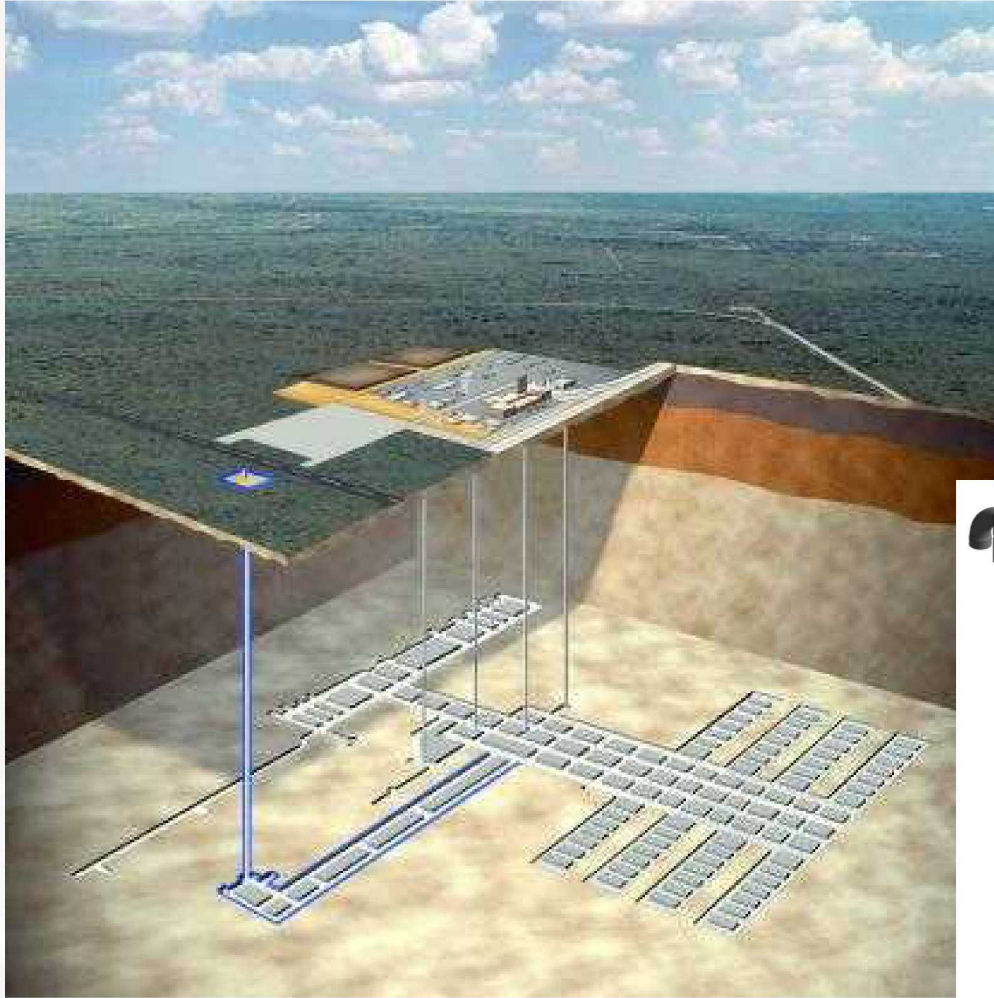


Far South End Closure Progress

- Initiated preparations for the withdrawal from the far south end (Panel 9)
- Cribbing, ventilation curtains and geo-mechanical instrumentation installed in the south mains
- Regulatory approvals for final closures - 2+ years with implementation to follow



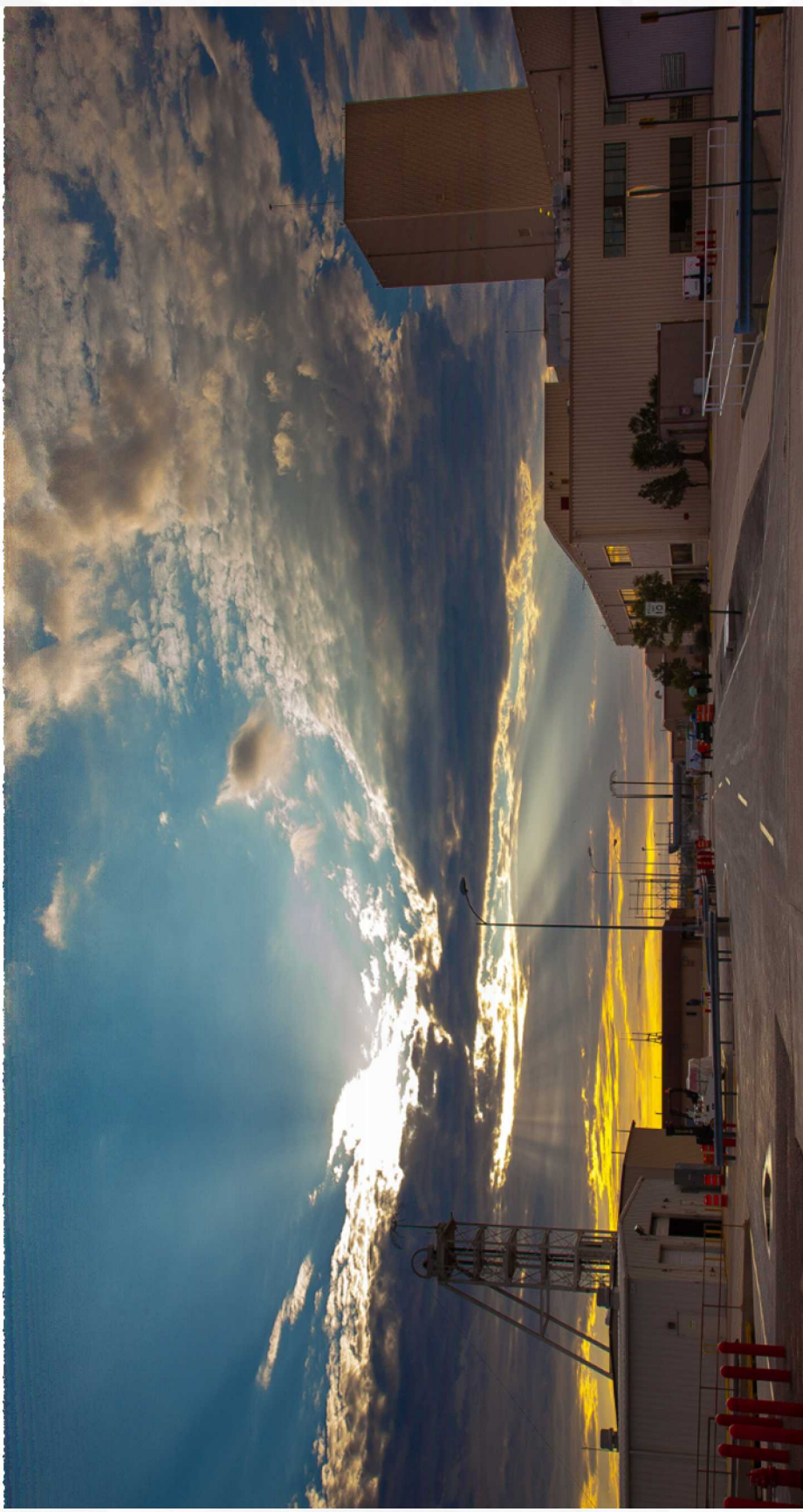
New Shaft and Ventilation



Lessons Learned

- Schedule over safety and conflicting cultures of nuclear vs mining were two major contributors to the incidents.
- Focus was on Nuclear Safety after the incidents. This is what DOE does best and knows historically. Ground control safety did not have appropriate priority.
- Ground control issues throughout repository, culminated in withdrawal of south end of mine following roof falls.
- Differences between the miners and the geotechnical engineers had to be resolved to move forward with ground control resolution.
- In limited operations now with limited ventilation.
- Have identified path forward to full operational return with full ventilation. This won't occur for approximately 4 years.

Questions



WIPP Underground Map

