



U.S. DEPARTMENT OF  
**ENERGY**

OFFICE OF  
**ENVIRONMENTAL  
MANAGEMENT**



July 20, 2022

## WIPP Northern New Mexico Citizens Advisory Board

Carlsbad Field Office/Waste Isolation Pilot Plant

Reinhard Knerr, Manager  
U.S. DOE, Carlsbad Field Office



# WIPP SUMMARY

- WIPP is America's only deep geologic repository for the permanent disposal of defense-generated transuranic (TRU) radioactive waste
- WIPP has been receiving waste since 1999 and has a proven track record for safe and compliant transport and emplacement of TRU waste
- WIPP's disposal limits are based on the Congressionally approved Land Withdrawal Act which authorizes disposal of 175,564 m<sup>3</sup> of TRU waste
- All TRU waste coming to WIPP must be fully characterized and certified to meet the WIPP Waste Acceptance Criteria





# What is TRU WASTE?

- WIPP receives defense-generated transuranic waste contaminated with man-made radioactive elements in concentrations greater than 100 nanocuries per gram
- TRU waste contains both radioactive and chemical elements

**PERIODIC TABLE**

93 (237) <b>Np</b> Neptunium	94 (244) <b>Pu</b> Plutonium	95 (243) <b>Am</b> Americium	96 (247) <b>Cm</b> Curium	97 (247) <b>Bk</b> Berkelium	98 (251) <b>Cf</b> Californium	99 (252) <b>Es</b> Einsteinium	100 (257) <b>Fm</b> Fermium	101 (258) <b>Md</b> Mendelevium	102 (259) <b>No</b> Nobelium	103 (266) <b>Lr</b> Lawrencium
------------------------------------	------------------------------------	------------------------------------	---------------------------------	------------------------------------	--------------------------------------	--------------------------------------	-----------------------------------	---------------------------------------	------------------------------------	--------------------------------------

# TRU WASTE CHARACTERIZATION PROCESS

SELECTED DRUM



RADIOGRAPHY



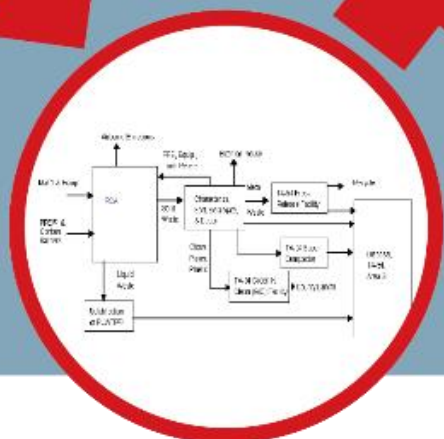
FLAMMABLE GAS ANALYSIS



NMED, NRC

NMED

NRC



PROCESS KNOWLEDGE  
AND CHARACTERIZATION  
INFORMATION



NON-DESTRUCTIVE ASSAY



CHARACTERIZED DRUM

Ensuring all waste received at WIPP meets the Waste Acceptance Criteria



## Contact-handled (CH)

- CH waste primarily emits alpha radiation (less penetrating) and can be handled under controlled conditions without any shielding beyond the container itself
- CH waste accounts for approximately 96 percent of waste disposed of at WIPP



A Radiological Control Technician conducts a survey of a waste container



## Remote-handled (RH)

- RH waste emits more penetrating gamma radiation than CH-TRU
- Both RH and CH are transported in NRC certified Type B shipping containers
- As indicated in the name, RH is handled and emplaced using remote handling equipment
- RH accounts for approximately four percent of waste disposed of at WIPP



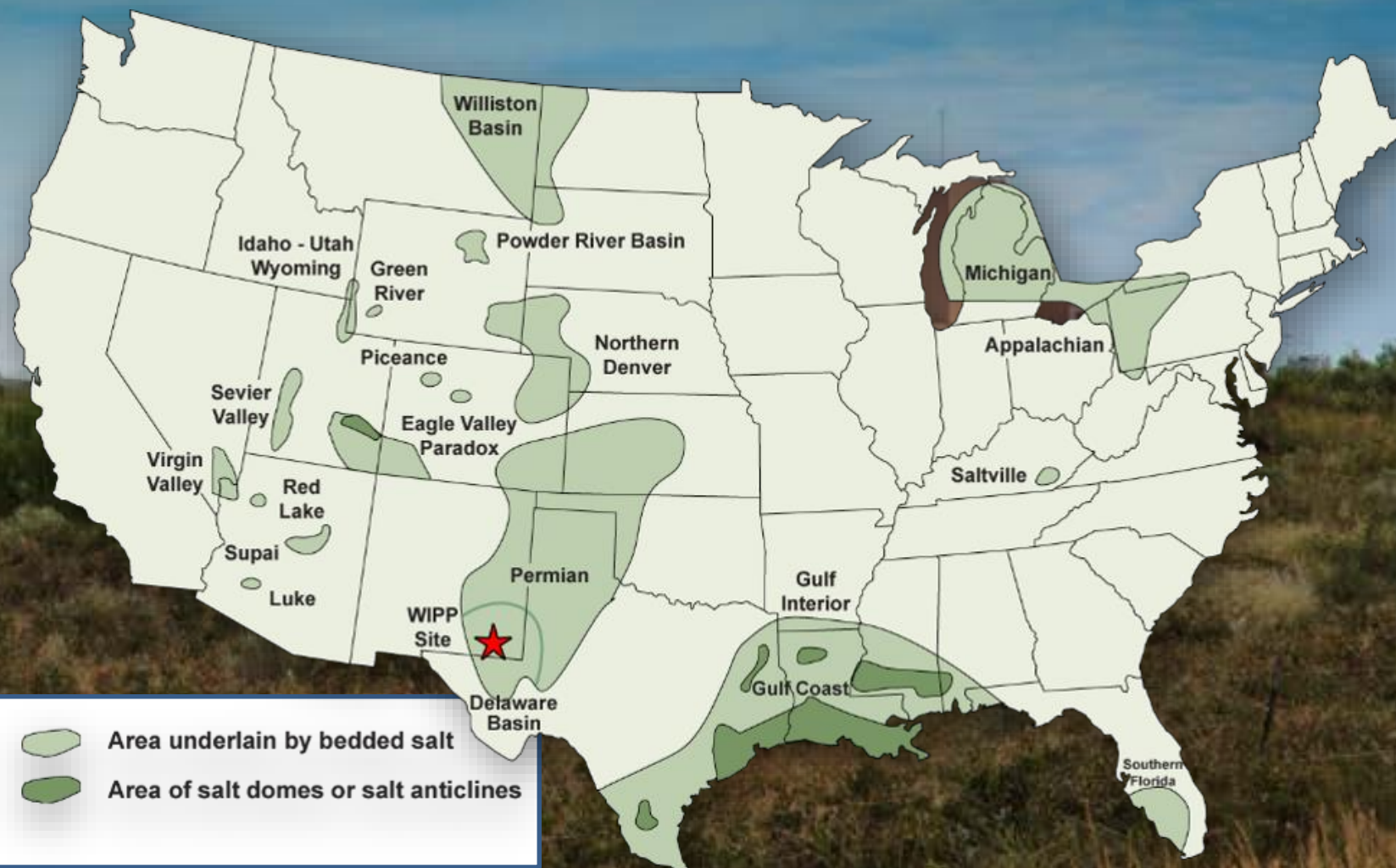


# SALT IS THE REASON FOR OUR LOCATION

WIPP is located 2150 feet below the Chihuahuan desert in a 250 million year old salt deposit. Salt was chosen because:

- Stable geology
- Dry environment
- Easy to mine
- Plastic quality of salt allows it to enclose and seal the waste

WIPP also has strong support from the local communities







# WIPP SUPPORTS THE National CLEANUP MISSION



- WIPP receives TRU waste from generator sites across the nation
- All WIPP shipments are made by highway using pre-approved transportation routes
- The WIPP transportation program is recognized as one of the safest in the world

WIPP is the cornerstone of the EM cleanup mission and has been instrumental in the cleanup of 22 DOE sites thus far



TRU Waste destined for disposal at WIPP is packaged in Department of Transportation (DOT) certified Type A packages e.g. 55-gallon drum and boxes. Type A packages undergo a series of tests to simulate routine transport conditions, including:

- water test (to simulate heavy rains)
- free fall drop test
- stacking test, and
- penetration test

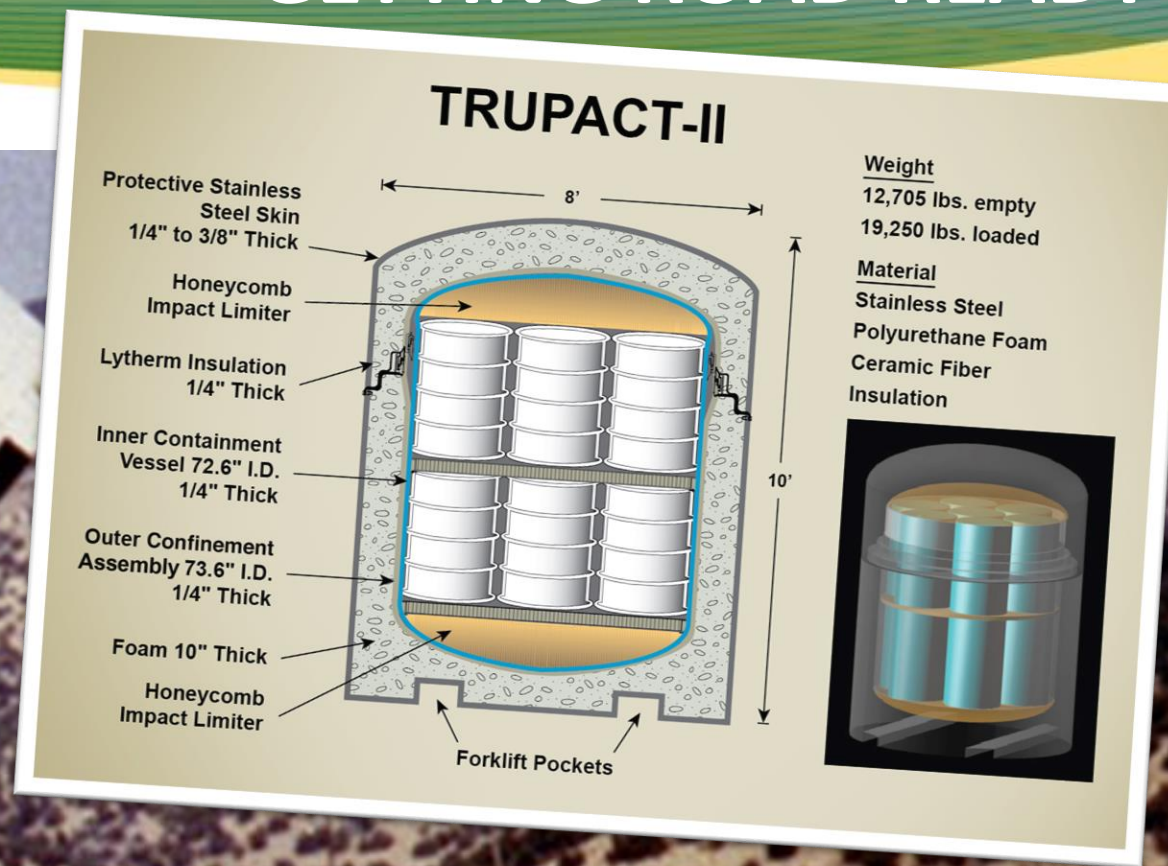
These Type A packages containing TRU waste are loaded into the more robust Type B packages certified by the Nuclear Regulatory Commission (NRC) for transport to WIPP.





Type B packages are robust shipping containers certified by the NRC to withstand hypothetical accident conditions without loss of containment. Testing of Type B container includes:

- 30 foot drop onto a flat, unyielding surface
- 40 inch drop onto a 6 inch diameter steel rod at least 8 inches long
- 1,475 degree fire for 30 minutes
- Water immersion test equivalent to external pressure under 50 feet of water









# SAFETY IS BUILT INTO WIPP TRANSPORTATION

WIPP currently uses four different NRC certified Type B shipping packages to accommodate different types and configurations of TRU waste.

- TRUPACT-II
- TRUPACT-III
- HalfPACT
- RH-72B



HalfPACT



RH-72B



TRUPACT-III





# WIPP DRIVER REQUIREMENTS

The WIPP transportation program has strict requirements for drivers transporting TRU waste to the WIPP facility:

- Must be a U.S. citizen
- Must have 325,000 miles in last five years/100,000 per year in two of last five years
- Must not have repeated chargeable incidents, moving violations, or a single DWI/DUI in their private vehicles
- Must not have been charged with a moving violation in a commercial vehicle in last five years
- Must pass background check





# SHIPMENT INSPECTION REQUIREMENTS



Additional requirements for WIPP shipments:

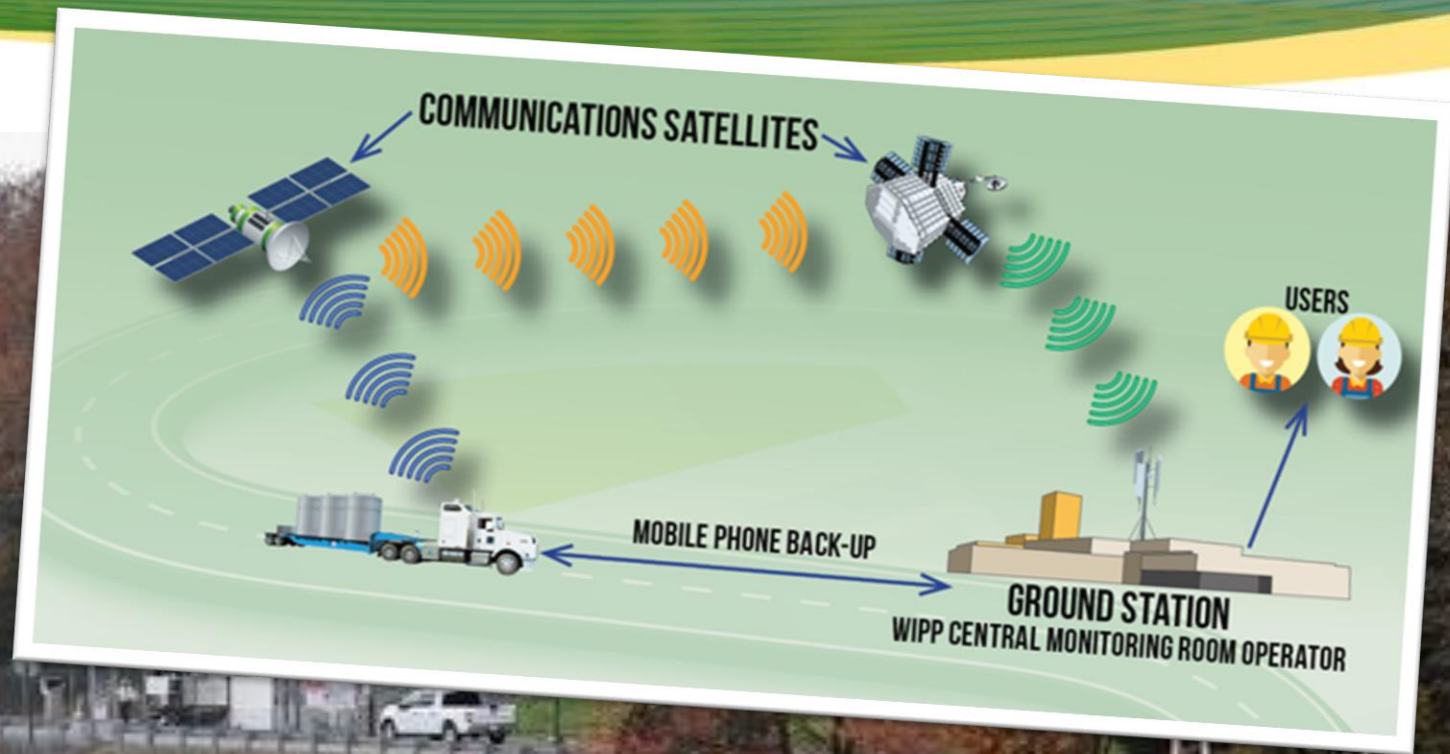
- Must pass Commercial Vehicle Safety Alliance Level VI inspection (100% defect free)
- Two drivers per shipment
- Driver inspects within first 50 miles
- Additional inspections every 3 hours or 150 miles
- Speed restricted to 65 mph
- Shipments not allowed to travel during weather warnings
- States can perform additional enroute inspections (CO and NM)



# SATELLITE TRACKING - TRANSCOM

WIPP uses a fully automated, nationwide satellite tracking system for TRU waste shipments. The system provides:

- Five-minute position updates
- Secure access for States and Tribal Nations along shipping corridors
- Constant communication between the truck and WIPP's Central Monitoring Room





WIPP coordinates with states, Tribal Nations and local communities along shipping corridors to provide emergency preparedness funding and first responder training and exercises (WIPPTREX).

Training includes:

- Modular Emergency Radiological Response Transportation Training (MERRTT & CMERRTT)
- RAD Technician, RAD Specialist, Hospital and Coroner classes are also provided





- Shipments to date in FY22: **169**
  - Loaded miles in FY22: **183,467**
- 
- Total shipments received: **13,140**
  - Total loaded miles traveled: **15,707,813**
  - Total CH waste containers emplaced: **265,639**
  - Total RH waste canisters emplaced: **775**
  - Shielded containers emplaced: **56** (included in total RH)

As of 07/13/2022





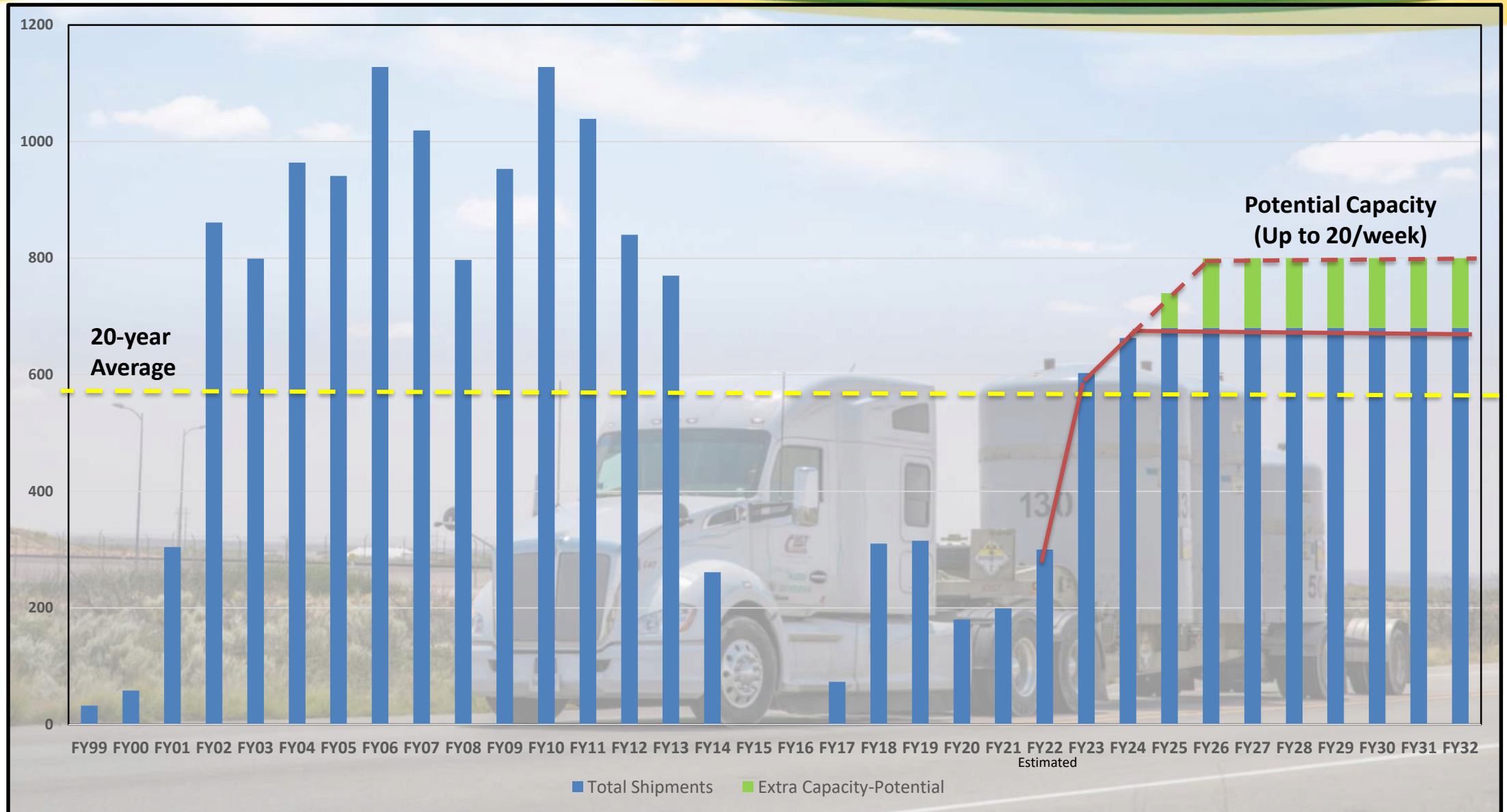
## Shipments in FY 2022

Site	Actual Shipments in FY 2021	Targeted Projected Shipments in FY 2022	Actual Shipments to Date in FY 2022
LANL	56	62	51
INL	100	190	104
ORNL	22	8	1
SRS	6	34	11
SQS (SNL, LLNL, ANL)	14	5	2
WCS	1	--	--
Total	199	299	169

\* FY22 targets are based on availability of certified TRU waste for shipment



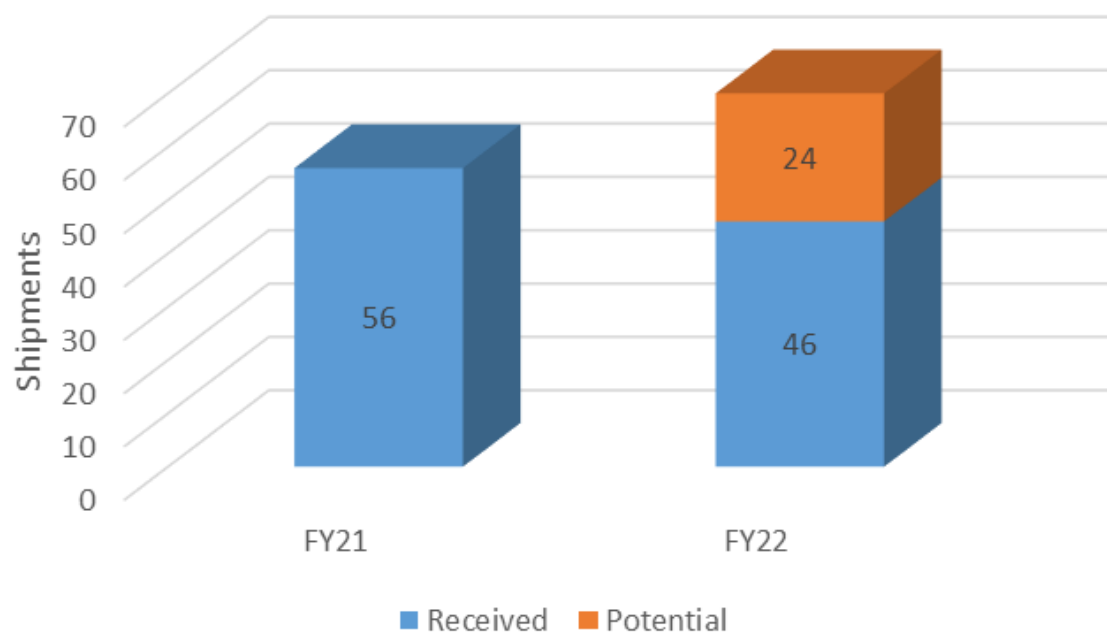






# NEW MEXICO WASTE REMAINS A PRIORITY

LANL Shipments



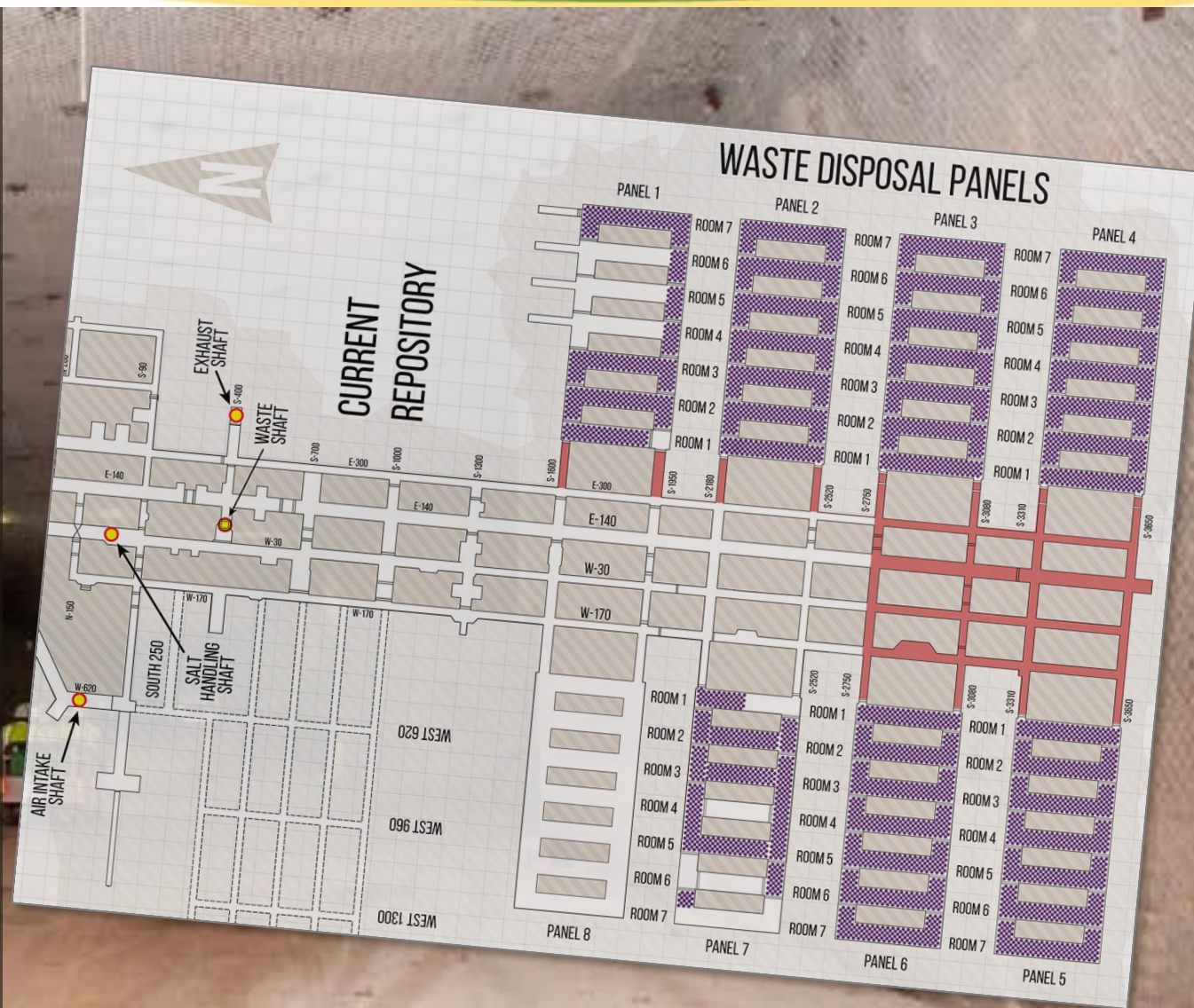
- Shipments from Los Alamos National Laboratory (LANL) and Sandia National Laboratories (SNL) remain a top priority
- RH waste shipments from SNL will begin once all regulatory approvals for additional Shielded Container Assemblies are received
- Shipments from LANL should continue to increase as efficiencies in waste characterization and certification are realized



- Panels 1 – 6 have been filled and closed
- Waste is currently being emplaced in the last available room in Panel 7
- Mining and outfitting of Panel 8 is complete and certification is underway

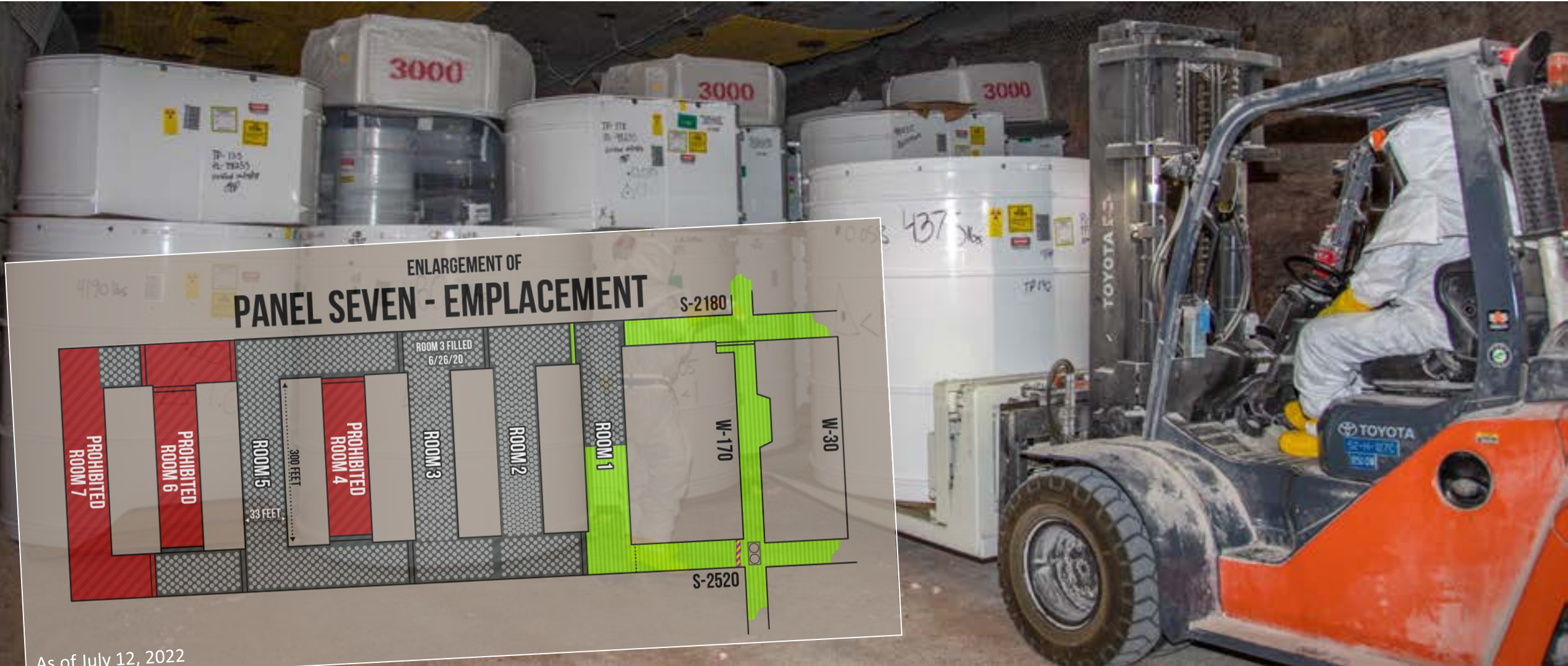
- CH 71,158 m<sup>3</sup>
- RH 361 m<sup>3</sup>

- Replacement Panels 11 and 12
- As a result of waste packaging and emplacement inefficiencies, additional Panels will be needed to complete the WIPP mission.”





# PANEL 7 EMPLACEMENT STATUS



As of July 12, 2022



Waste emplacement is projected to begin in Panel 8 late this summer. Advantages to moving to Panel 8 are:

- No personal protective equipment will be required
- Improved ground conditions





# NEPA ACTIONS FOR FUTURE PANELS

- Upcoming National Environmental Policy Act (NEPA) proposed action is to continue TRU waste disposal operations up to the Congressionally authorized total TRU waste volume capacity limit in the WIPP Land Withdrawal Act (LWA):
  - Analysis of the impacts of the excavation and use of additional disposal panels, beyond Panel 12, needed to dispose of TRU waste up to the Congressionally authorized WIPP LWA total TRU waste volume capacity limit
  - Evaluation of resource areas such as air, geology, hydrology, biology, land use, green house gases, transportation, facility and long-term repository performance
  - Align future needs with the WIPP strategic vision





# CAPITAL PROJECTS – Preparing WIPP for the Future

Utility Shaft headframe (US Project)



Salt Reduction Building (SRB)



Fabrication Building (FAB)



Safety Significant Confinement Ventilation System (SSCVS) with the New Filter Building (NFB) on the left and the Salt Reduction Building (SRB) on the right





Visit the WIPP Website at the address below for a  
Virtual Tour of the WIPP site  
<https://wipp.energy.gov/about-us.asp>

# Questions?