



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
**ENVIRONMENTAL
MANAGEMENT**



July 7, 2022

WIPP COMMUNITY FORUM

Carlsbad Field Office/Waste Isolation Pilot Plant

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



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
**ENVIRONMENTAL
MANAGEMENT**



U.S. DEPARTMENT OF
ENERGY

2022: A LOOK AHEAD

Reinhard Knerr

U.S. Department of Energy,
Carlsbad Field Office Manager

- WIPP is America's only deep geologic repository for the permanent disposal of defense-generated transuranic (TRU) radioactive waste
- DOE has a proven track record for safe and compliant transport and emplacement of TRU waste
- Congressionally approved Land Withdrawal Act authorizes disposal of 175,564 m³ of TRU waste
- All TRU waste must meet the WIPP Waste Acceptance Criteria
- We strive for open and transparent communication with all stakeholders

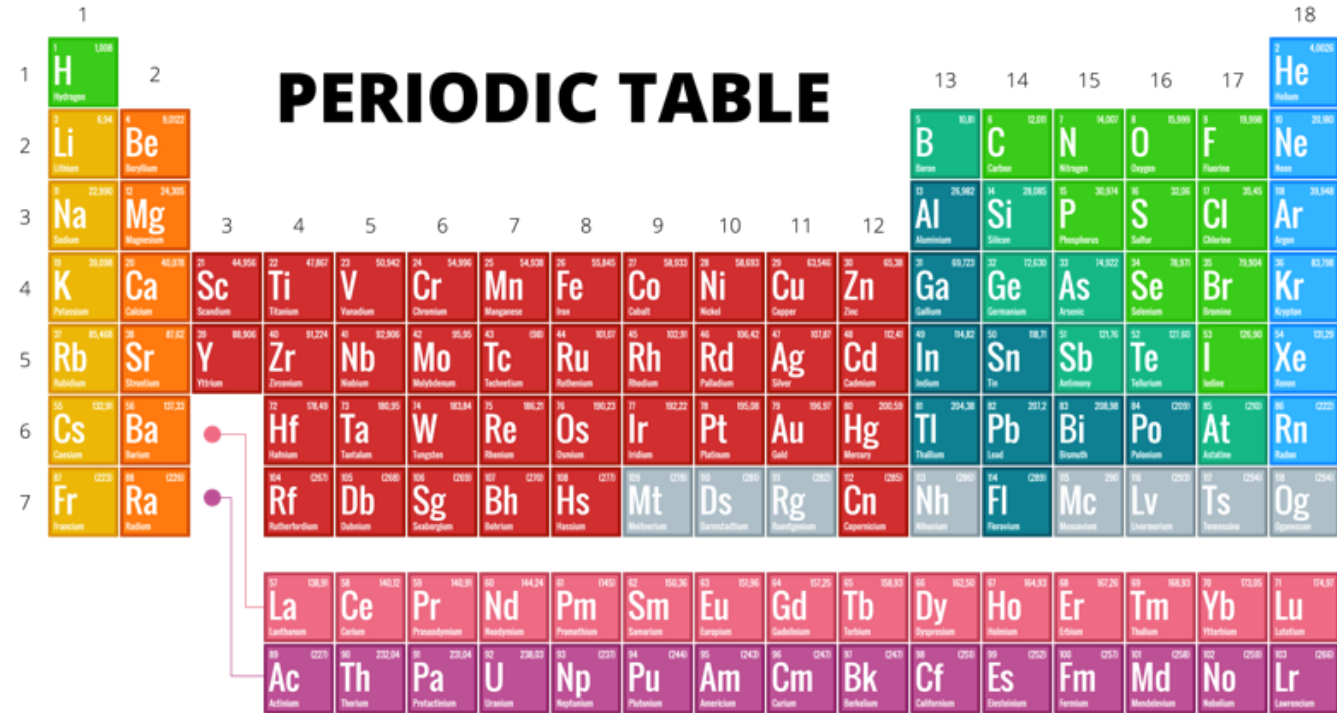


WIPP is America's only deep geologic repository for the permanent disposal of defense-generated transuranic (TRU) radioactive waste left from research and production of nuclear weapons.



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



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

TRU WASTE CHARACTERIZATION PROCESS

SELECTED DRUM



RADIOGRAPHY



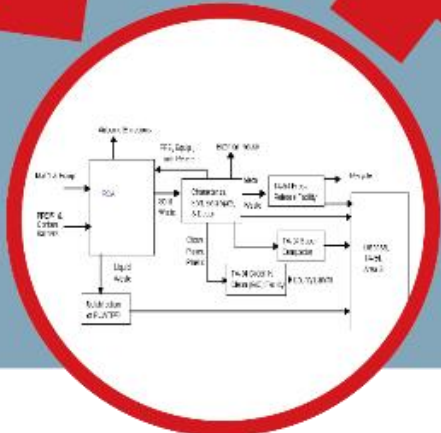
FLAMMABLE GAS ANALYSIS



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)

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



A Radiological Control Technician conducts a survey of a waste drum

Remote-handled (RH)

- Emits more penetrating radiation than CH-TRU
- Transported and handled in certified casks that provide additional shielding
- Accounts for approximately four percent of waste disposed of at WIPP



SALT IS THE REASON FOR OUR LOCATION

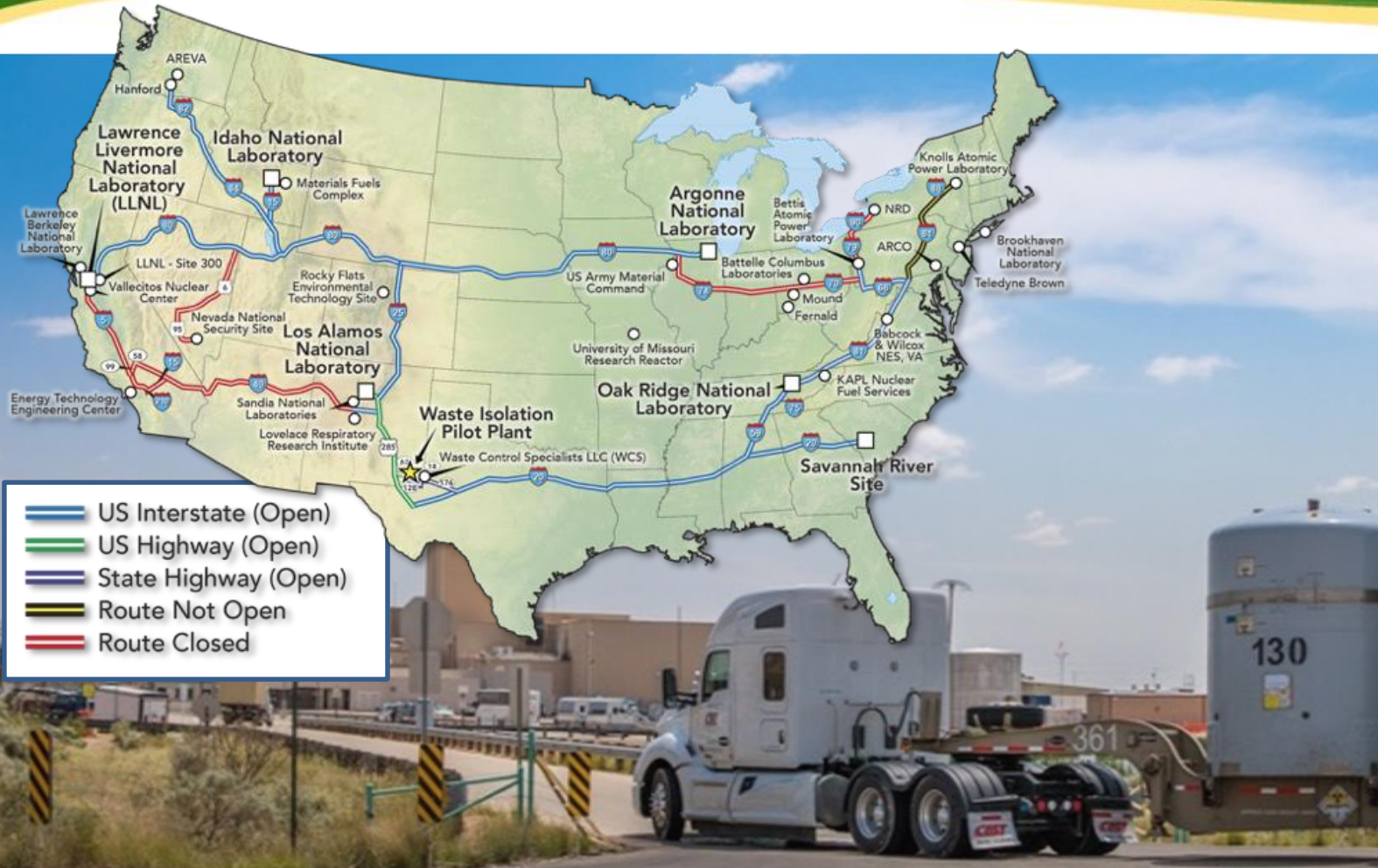
- Stable geology
- Dry environment
- Easy to mine
- Plastic quality of salt allows it to close in on the waste
- Strong community support





Total number of TRU waste sites cleaned up to date: 22





- WIPP receives TRU waste from generator sites across the nation
- All shipments are made by highway using pre-approved routes through New Mexico to arrive safely at WIPP
- 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:

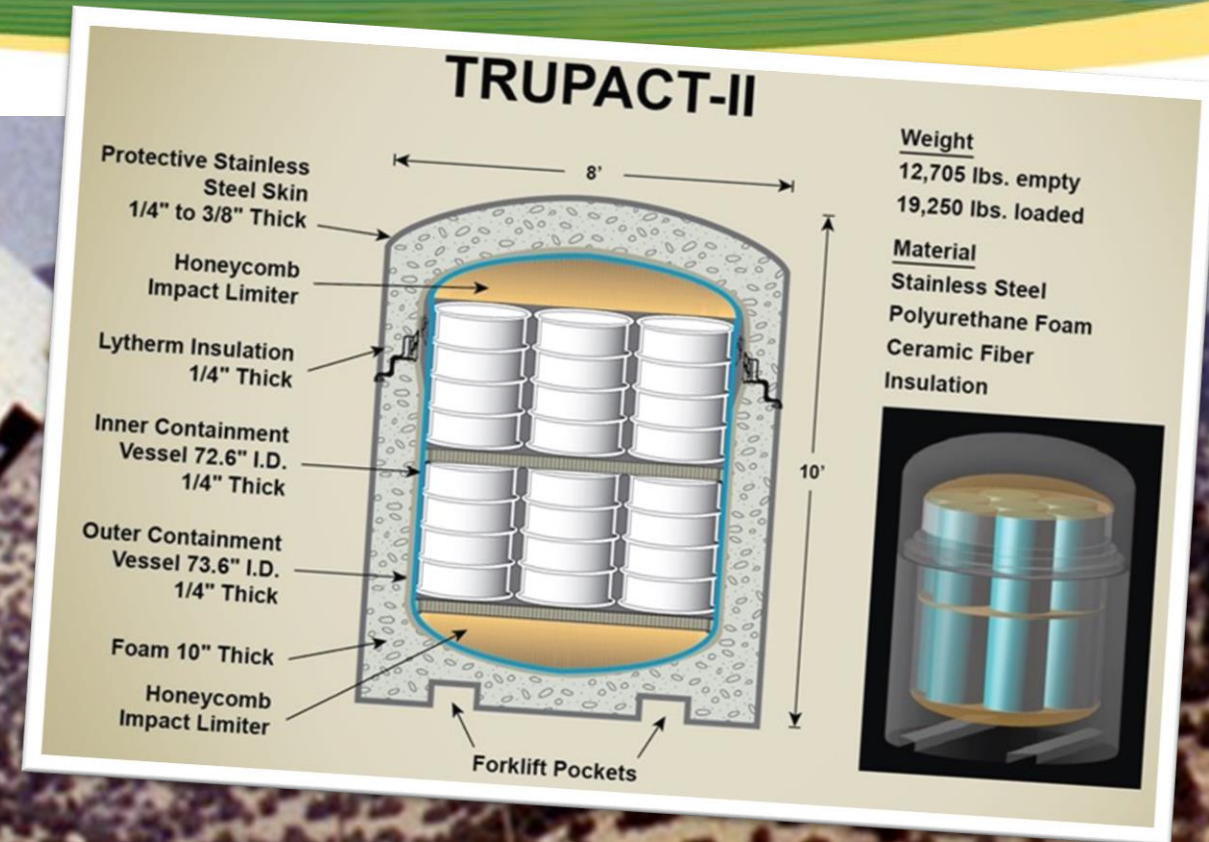
- water test (to simulate heavy rains)
- free fall drop test
- stacking test, and
- penetration test

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 Type B shipping packages to accommodate different types and configurations of TRU waste.

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



TRUPACT-II



RH-72B



HalfPACT



TRUPACT-III



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

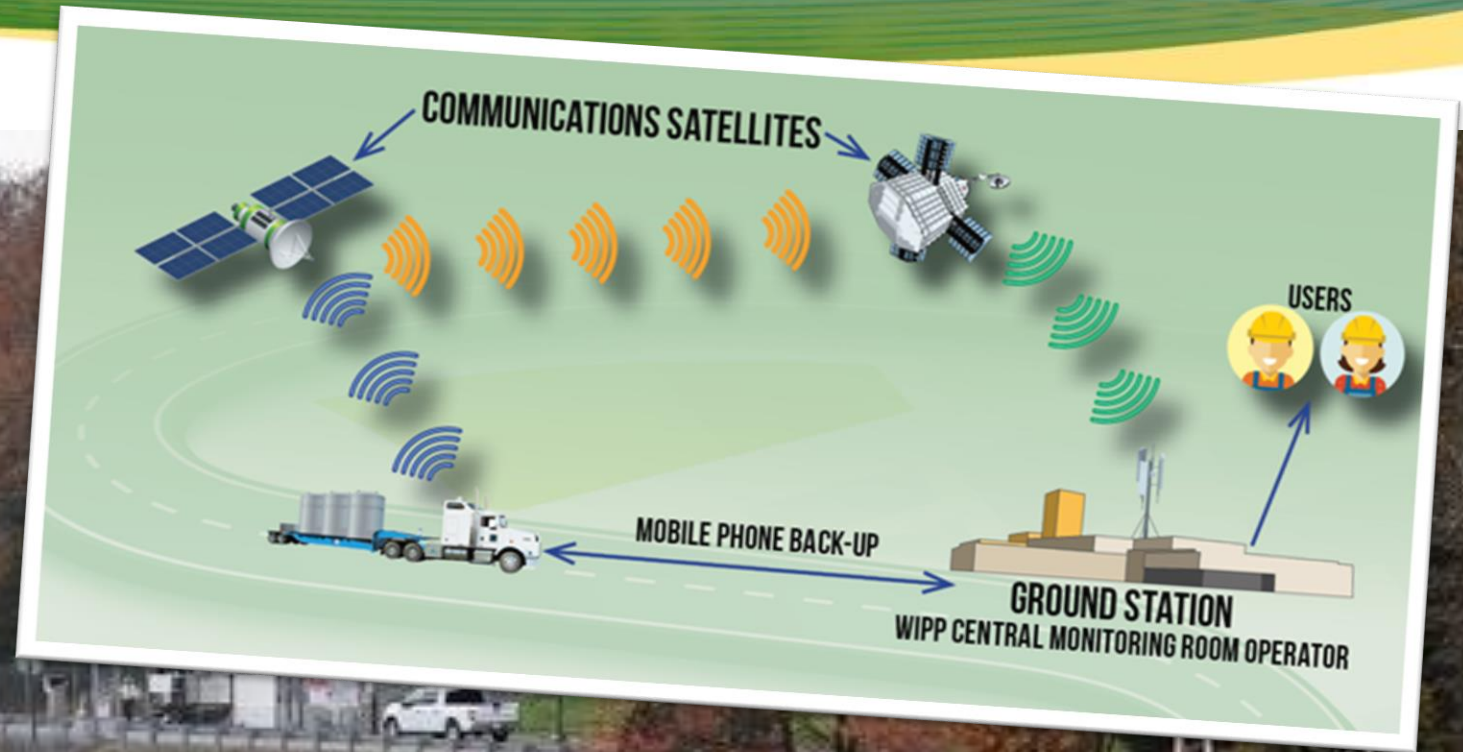



Additional requirements for WIPP shipments:

- 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)

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: **158**
- Loaded miles in FY22: **171,245**
- Total shipments received: **13,129**
- Total loaded miles traveled: **15,696,983**
- Total CH waste containers emplaced: **265,552**
- Total RH waste canisters emplaced: **775**
- Shielded containers emplaced: **56** (included in total RH)

As of 07/05/2022





WIPP Priorities for FY22

- Return to 10-12 shipments per week in 2022
- ✓ See major progress on the SSCVS and Utility Shaft projects
- ✓ Complete Shielded Container approvals – NRC approval received
- ✓ Prioritize Los Alamos National Laboratory-EM shipments & Idaho Cleanup Project shipments to meet milestones
- ✓ Begin mining drifts to the west
- ✓ Start refurbishment of major pieces of Remote Handled Equipment – FY22 priority is 140/25 Ton Bridge Crane
- Transition to the new M&O contractor in late FY22

WIPP Land Withdrawal Act (Public Law 102-579) allows for 175,564 cubic meters of TRU waste to be disposed at the WIPP facility

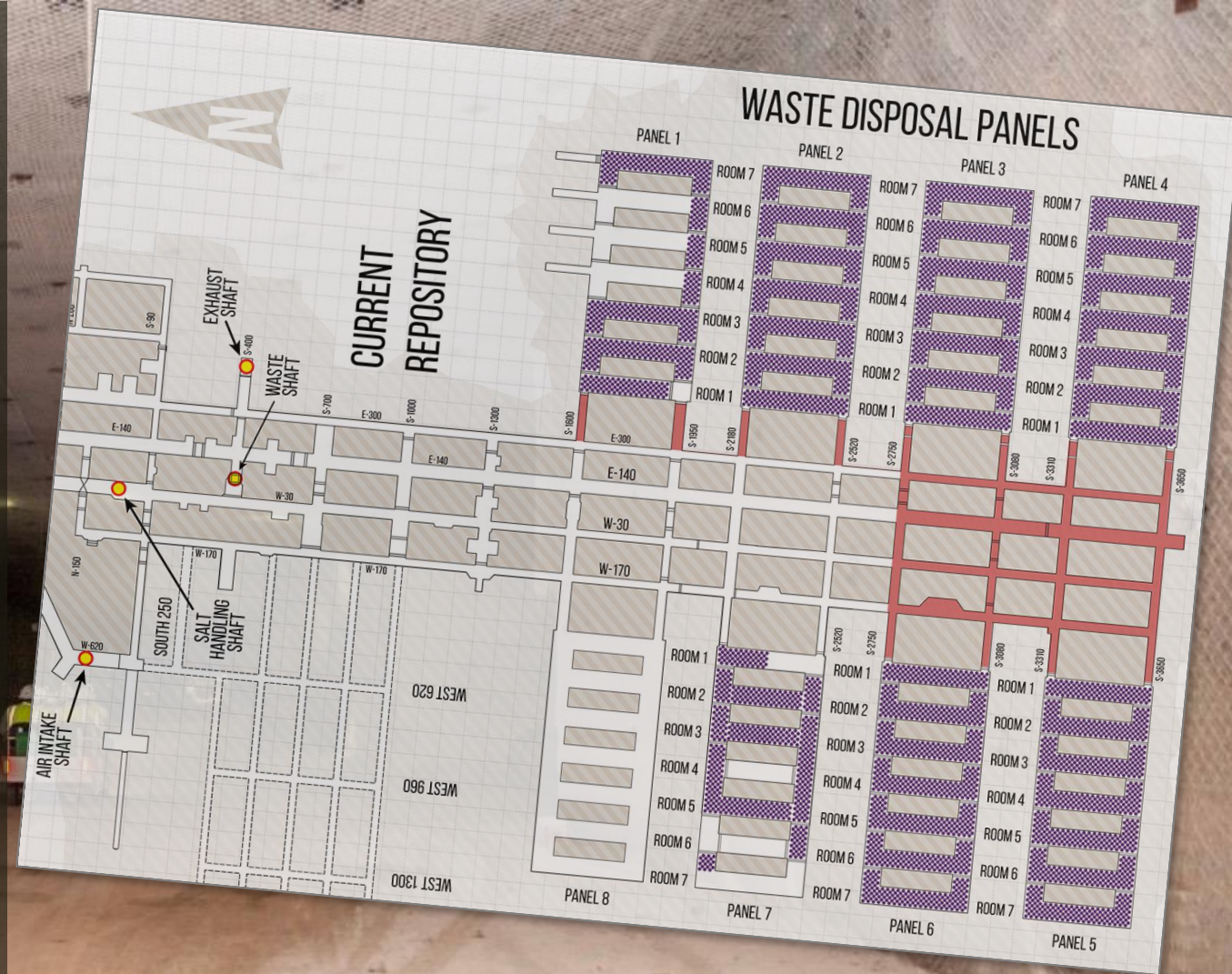
- Panels 1 – 6 have been filled and closed
- Currently emplacing waste in the last available room in Panel 7
- Mining and outfitting of Panel 8 is complete and certification is underway

Approximately 40% of WIPP LWA total TRU waste volume emplaced

- CH 71,361 m³
- RH 361 m³

Additional disposal panels and infrastructure investments are needed to accommodate the Congressionally authorized disposal volume in the LWA

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

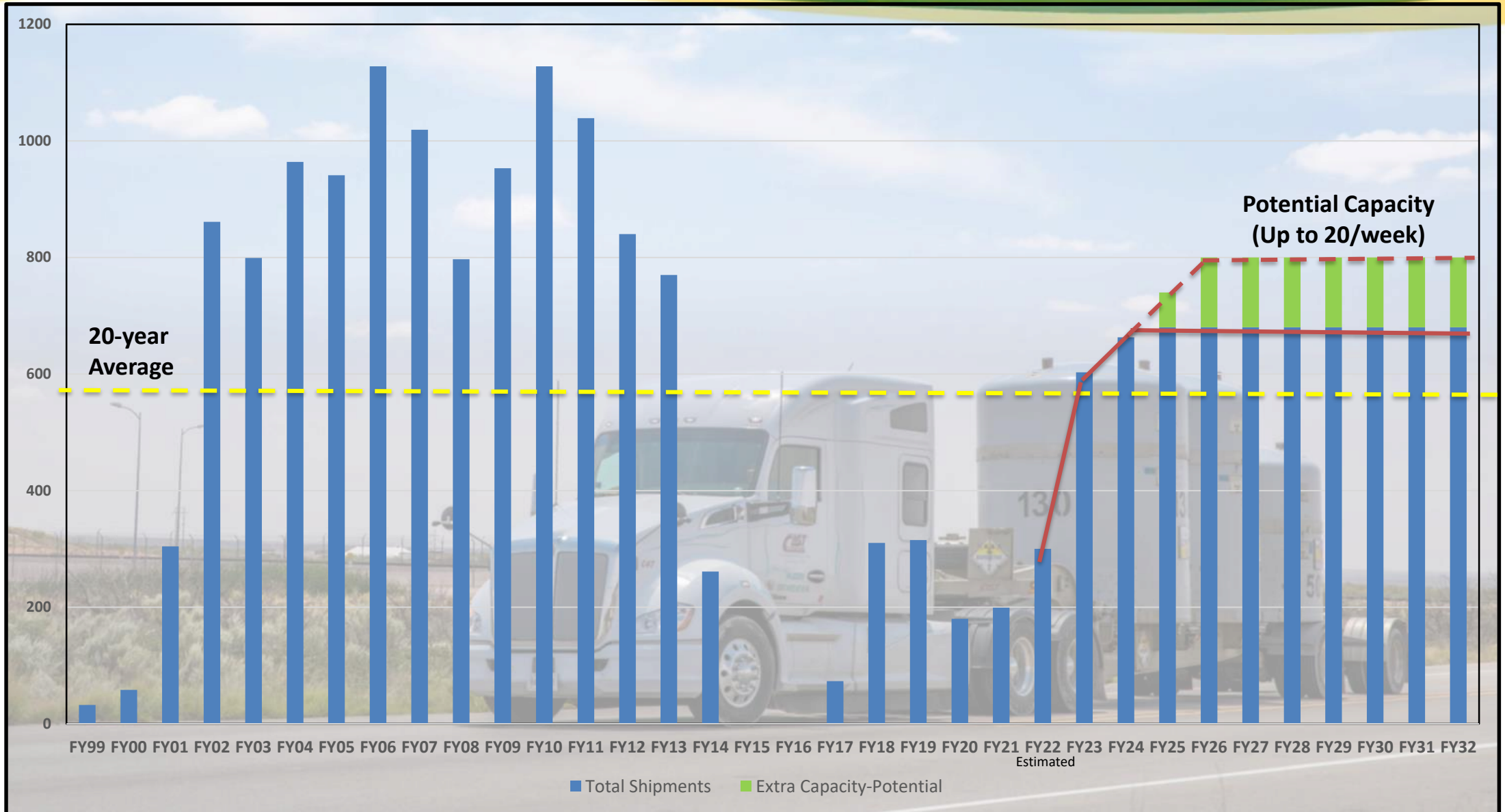


Shipments in FY 2022

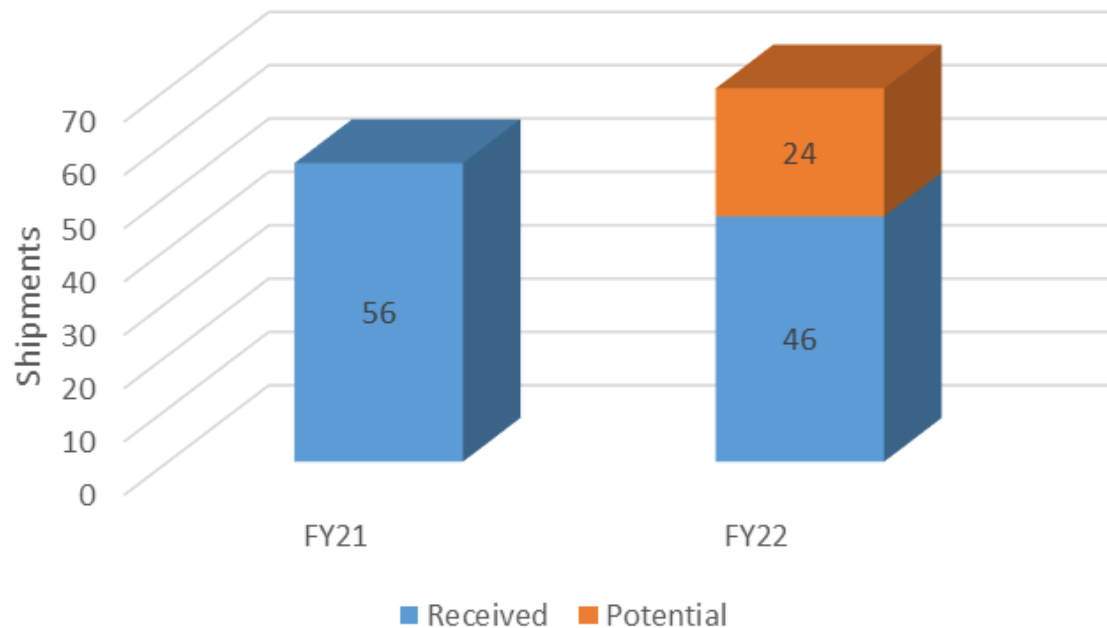
Site	Actual Shipments in FY 2021	Targeted Projected Shipments in FY 2022	Actual Shipments to Date in FY 2022
LANL	56	62	46
INL	100	190	91
ORNL	22	8	1
SRS	6	34	10
SQS (SNL, LLNL, ANL)	14	5	2
WCS	1	--	--
Total	199	299	150

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





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 upon approval of Shielded Container Assemblies
- Shipments from LANL continue to increase
- Minimal inventory of certified waste at LANL
 - Two shipments per week
 - Evaluating opportunities to implement additional efficiencies for waste characterization, certification and packaging

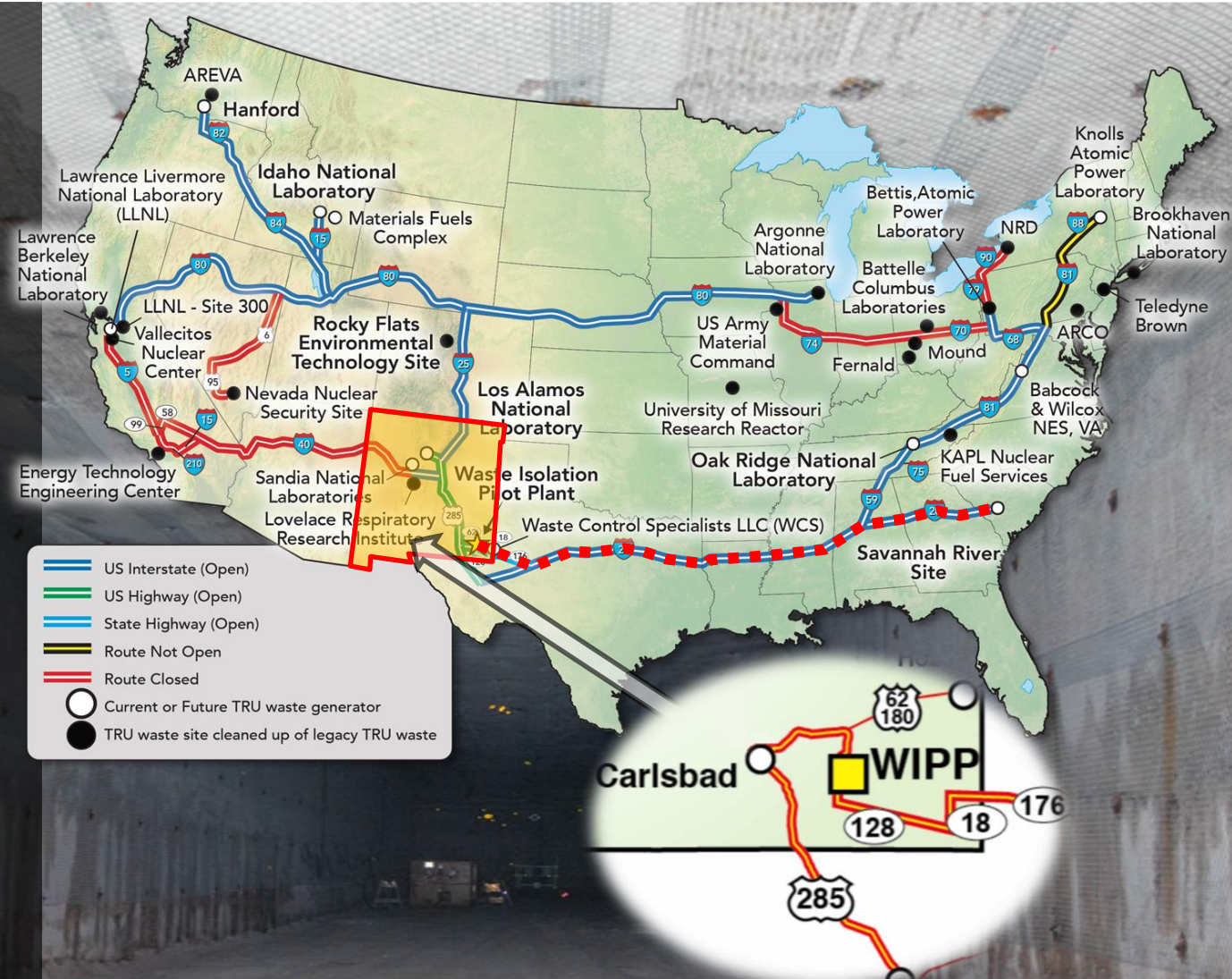


- Frequent communication with LANL along numerous channels to include:
 - Working groups to track inventory reduction at the site
 - Generator site quarterly meetings
 - Special topic visits and calls
 - Monthly site calls
 - Special integrated project team at the executive level.
- Coordinate with the site to meet security needs, promote multiple contractor use of RANT, working with both Triad and N3B to integrate into a single certified program
- Provide support during the waste characterization stage
 - Primarily interfacing with the site through an established agreement to ensure waste is certified in an efficient manner taking into account individual site needs and operations

- Improvements in efficiency comes from consistency and operational improvements
 - Working with generator sites to follow standardized processes helps certify waste more efficiently
 - Having defined steps in waste certification that the site can support increases efficiency
- Collaborate with individual sites to deal with difficult waste issues and leverage expert-level scientific report when necessary from National Laboratories
- Larger waste populations ready to ship allow us to build efficient shipments were we account for site and WIPP needs related to waste shipment and emplacement

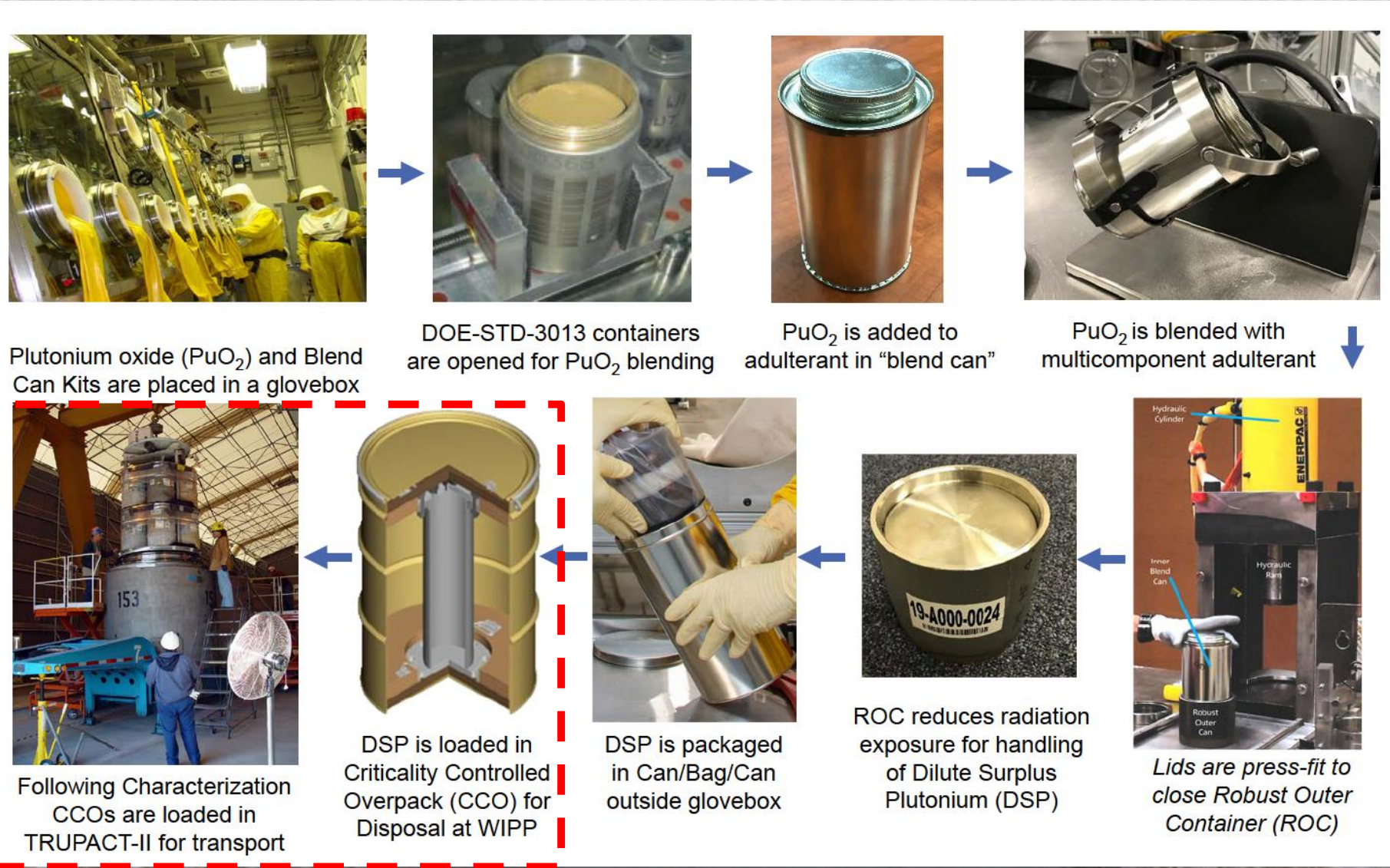


- The Savannah River Site is working with WIPP on a disposition strategy for plutonium materials that have been declared excess
- The strategy for disposition of excess plutonium materials is to process and dispose in a manner that is proliferation resistant and prevents future reuse of the material in nuclear weapons.
- The dilute and dispose approach, also referred to as plutonium down blending, consists of blending plutonium oxide with a multicomponent adulterant, packaging for shipment, and disposing in a geologic repository.
- Once the material has completed the down-blending process it becomes TRU waste eligible for disposal at the WIPP facility.
- A similar disposition approach for TRU waste has previously been used to dispose of plutonium-bearing TRU waste residues at the WIPP facility.





WIPP involvement in the process





- The Department of Energy (DOE) Office of Environmental Management (EM) is currently using down-blending to disposition 6 metric tons (MT) of surplus plutonium at Savannah River Site (SRS) facilities.
- Current focus is on disposing of the currently approved 6 MT and planning for the more recently approved 7.1 MT of TRU waste
- Additional amounts of surplus plutonium are being evaluated for disposal at WIPP

National Nuclear Security Administration Contact:

Harris Walker

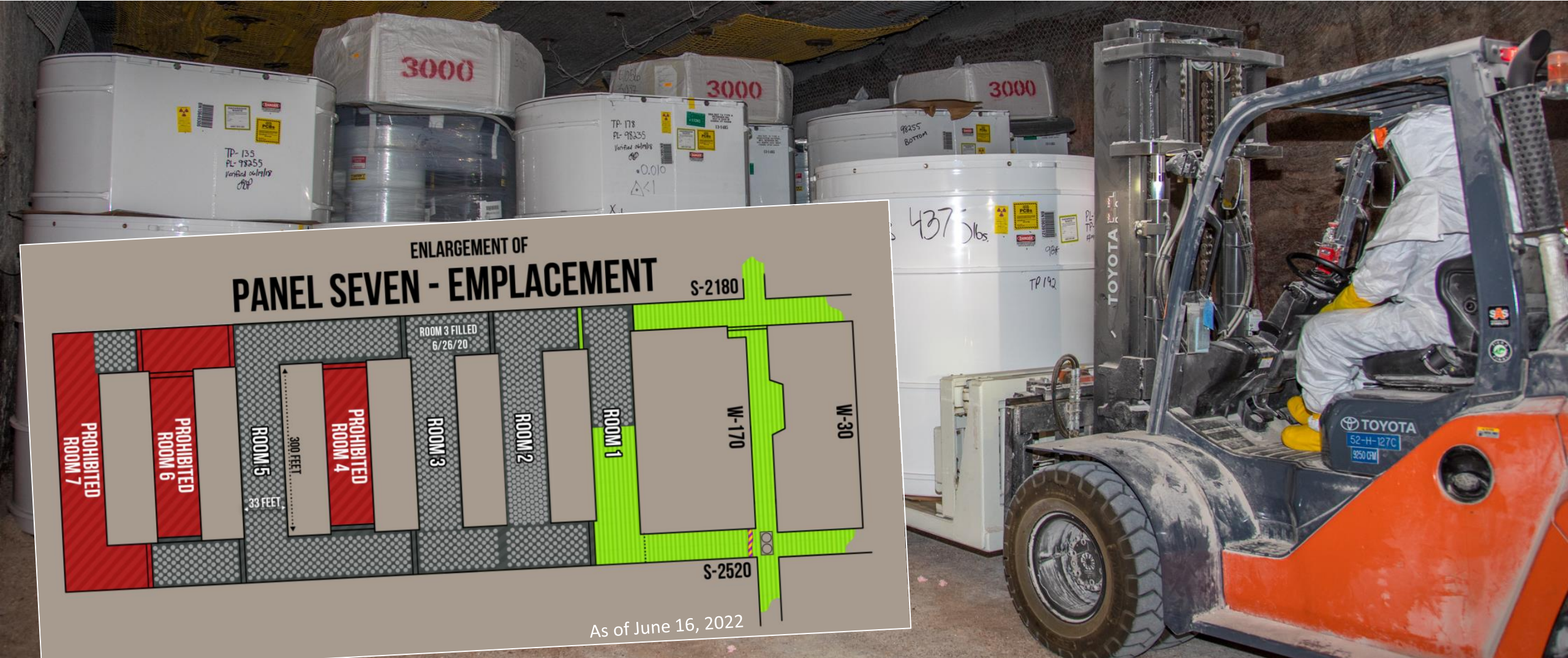
Harris.walker@nnsa.doe.gov



2022 WIPP PROGRESS UPDATE

Sean Dunagan

NWP President & Project Manager



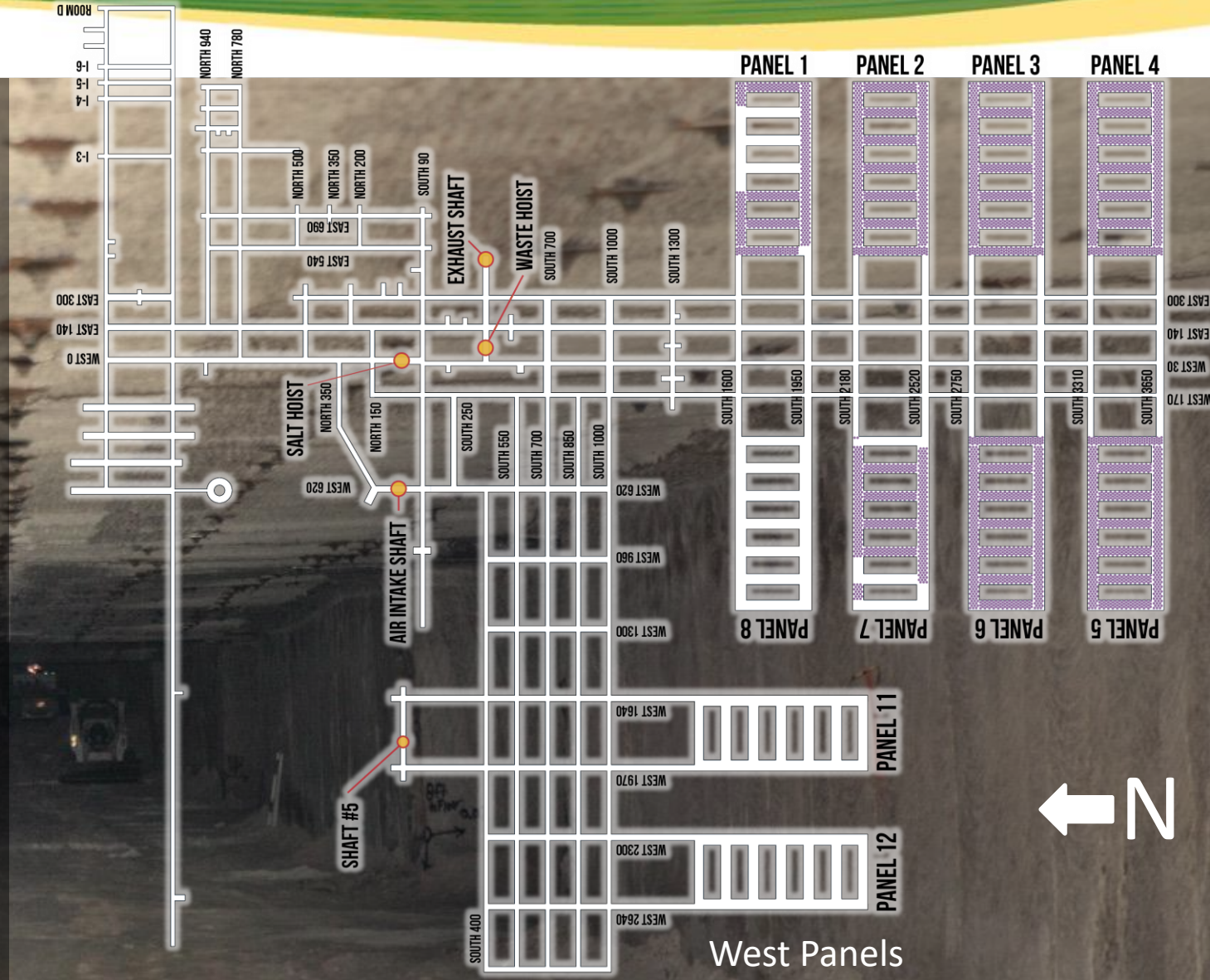
As of June 16, 2022

- Emplacement in Panel 8 is project to begin late this summer
- No personal protective equipment will be required
- Improved ground conditions



To be Completed in FY2022

- Projected to mine 6,231 linear feet in 2022
 - 41.5% of the total of roughly 15,000 linear feet that will be mined in the creation of the three drifts and crosscuts to access panels 11 & 12
 - Mining access drifts projected completion date – April 2024
 - Mining Panel 11 projected completion date – March 2025, ready for waste November 2025
 - Mining Panel 12 projected completion date – October 2027, ready for waste June 2028



West 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):

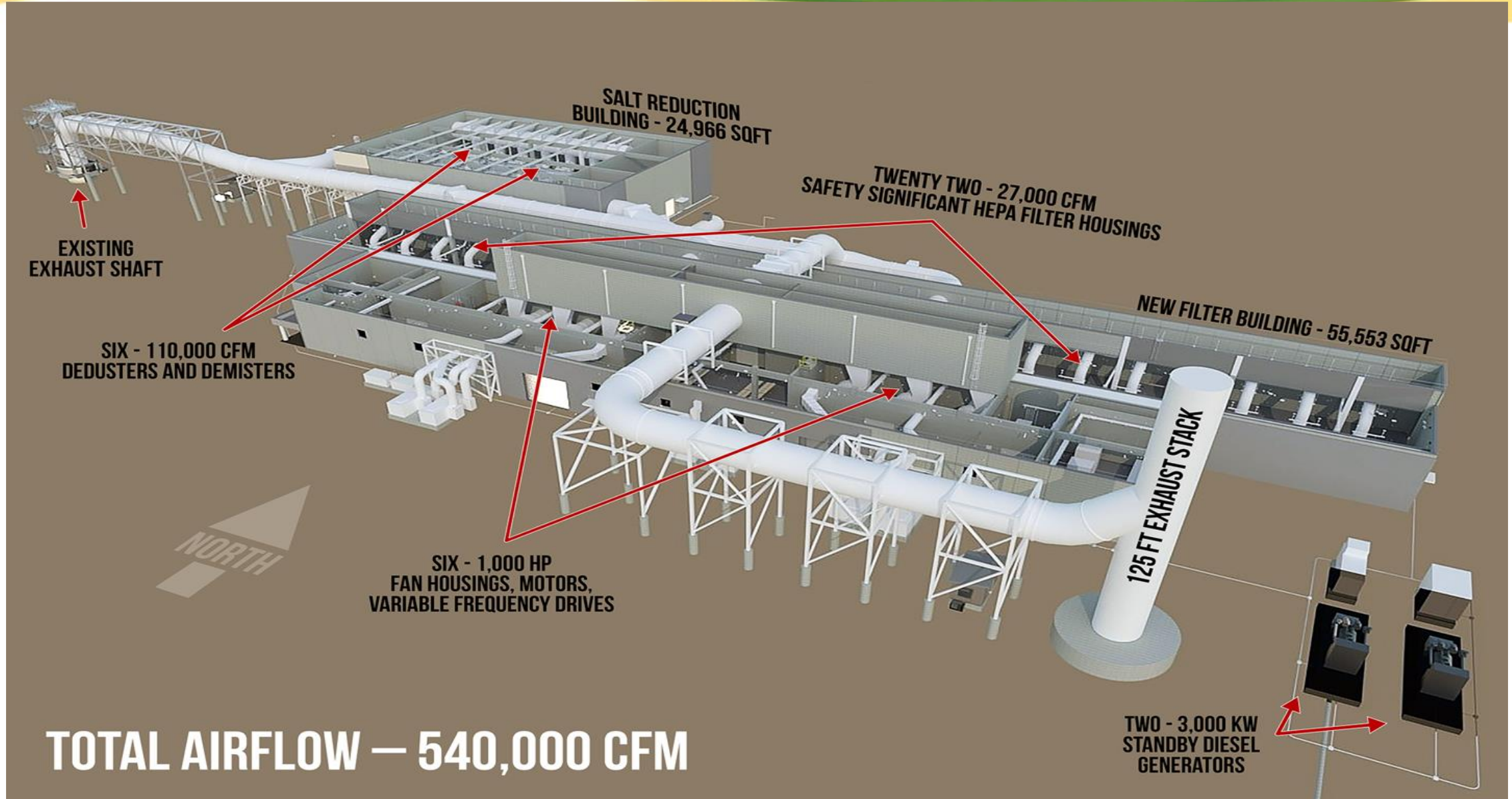
- Analysis of the impacts of the excavation and use of additional disposal panels, beyond Panel 12, needed to dispose of TRU waste up to the Congressionally authorized WIPP LWA total TRU waste volume capacity limit
- Development of a list of reasonable alternatives for the WIPP facility.
- Evaluation 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



PROGRESS ON THE SAFETY SIGNIFICANT CONFINEMENT VENTILATION SYSTEM (SSCVS)



- The SSCVS Project will increase high-efficiency particulate air (HEPA) to the WIPP underground, increasing worker safety throughout the mine.
- SSCVS Project is ~63% complete
 - Salt Reduction Building is ~60% complete
 - New Filter Building is ~59% complete





FY2022 Accomplishments

- Completed construction of interior concrete masonry walls
- Interior painting completed
- Installation of interior electrical (lighting, receptacles) nearing completion and exterior lighting complete
- 6 of 6 salt reduction units completed
- 10 sections of duct installed
- Turbofans and silencers have been installed on structural steel support located on the ceiling of the SRB

Interior of the Salt Reduction Building

Goals in FY2022

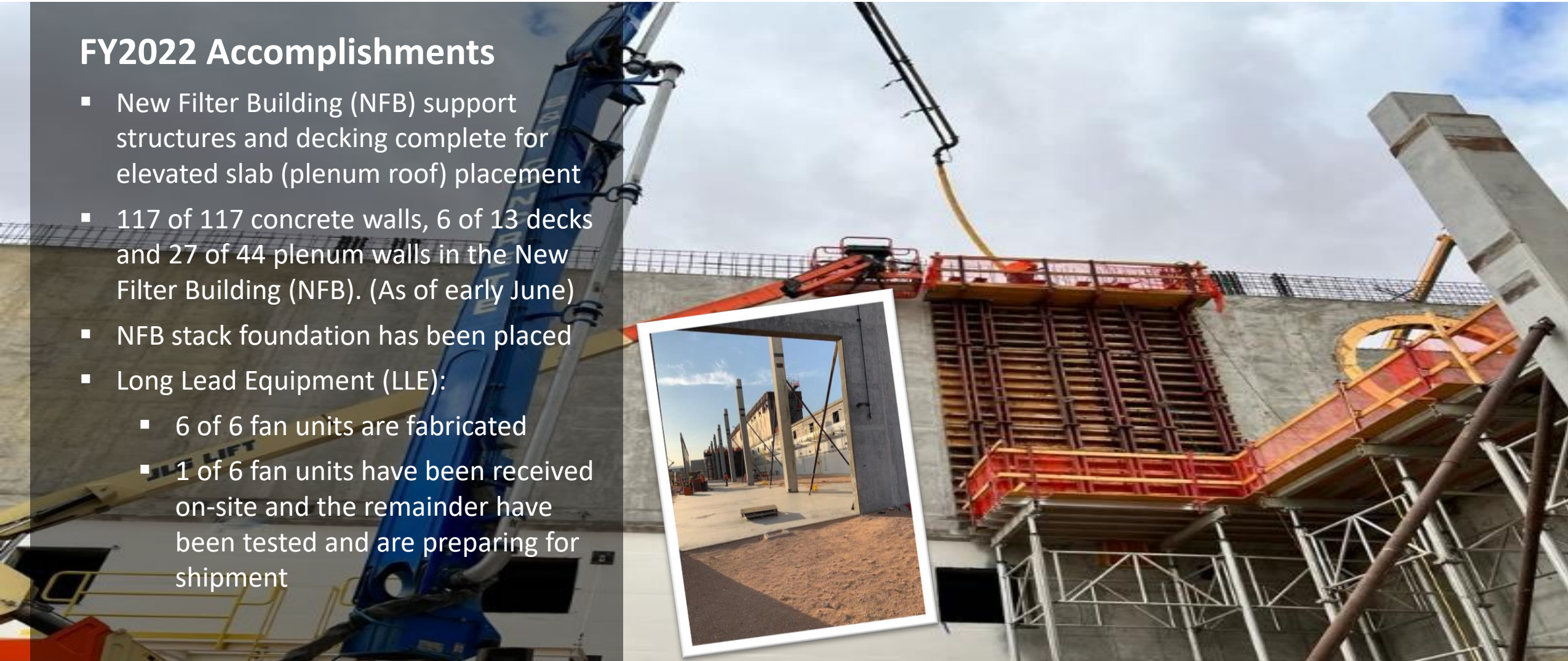
- Complete installation of Internal utility systems
 - ✓ Lights
 - Electrical
 - ✓ Utilities
 - ✓ Fire protection
- Initiate installation of major systems
 - Fans
 - ✓ Salt Reduction Units
 - ✓ De-dusters
 - ✓ De-misters
 - ✓ Booster Fans





FY2022 Accomplishments

- New Filter Building (NFB) support structures and decking complete for elevated slab (plenum roof) placement
- 117 of 117 concrete walls, 6 of 13 decks and 27 of 44 plenum walls in the New Filter Building (NFB). (As of early June)
- NFB stack foundation has been placed
- Long Lead Equipment (LLE):
 - 6 of 6 fan units are fabricated
 - 1 of 6 fan units have been received on-site and the remainder have been tested and are preparing for shipment





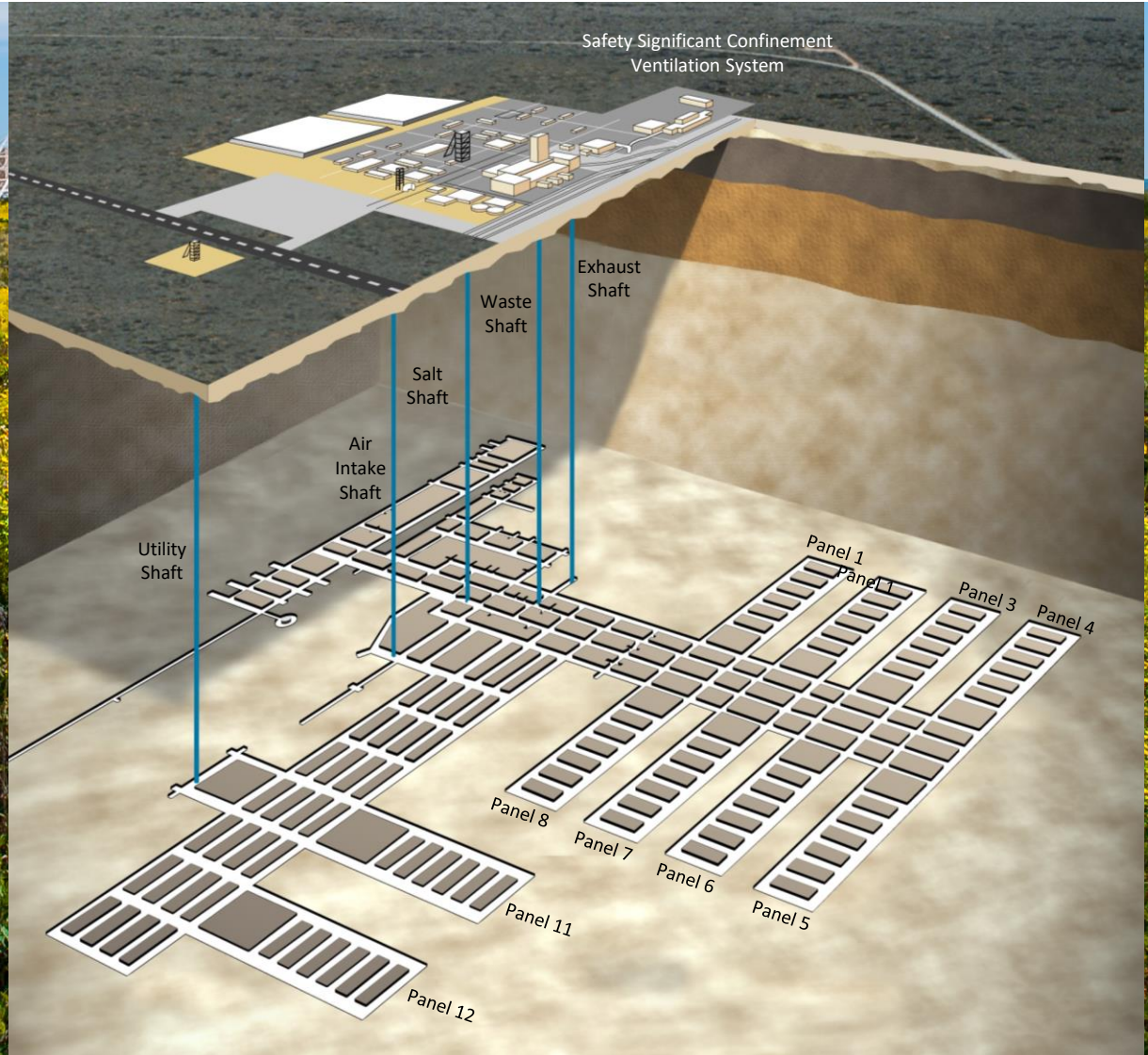
Goals in FY2022

- Complete structural construction of the New Filter Building (NFB)
 - ✓ Shear walls complete
 - ✓ Precast roof panels installed
- Complete interior painting
- Install Fire Protection

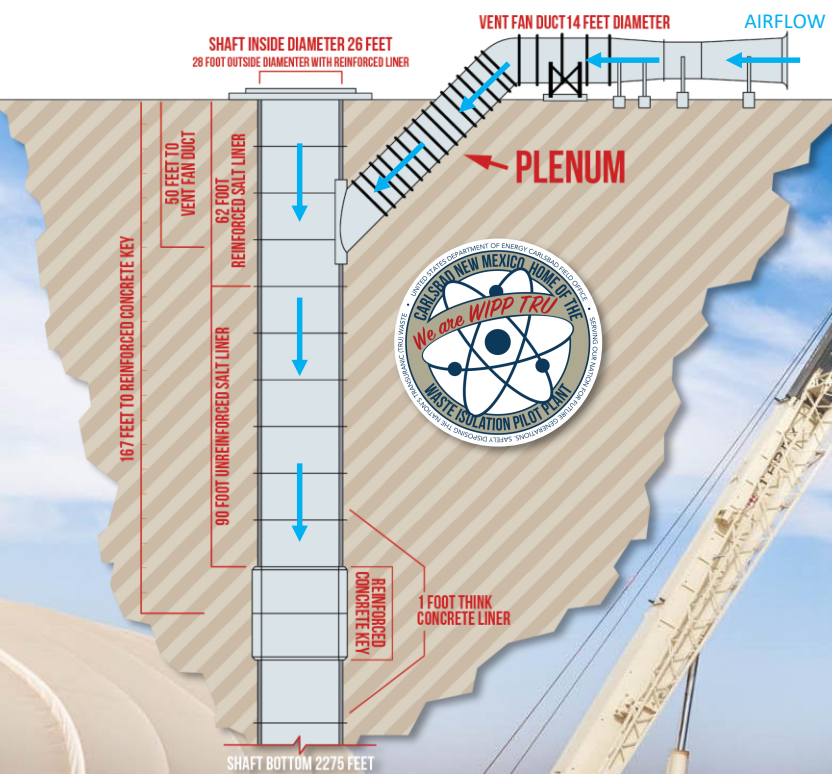




- The Utility Shaft is a new 2,150-foot vertical air intake shaft, with supporting infrastructure. The Utility Shaft will provide an unfiltered underground ventilation circuit for the mining dust to be removed from the underground repository.

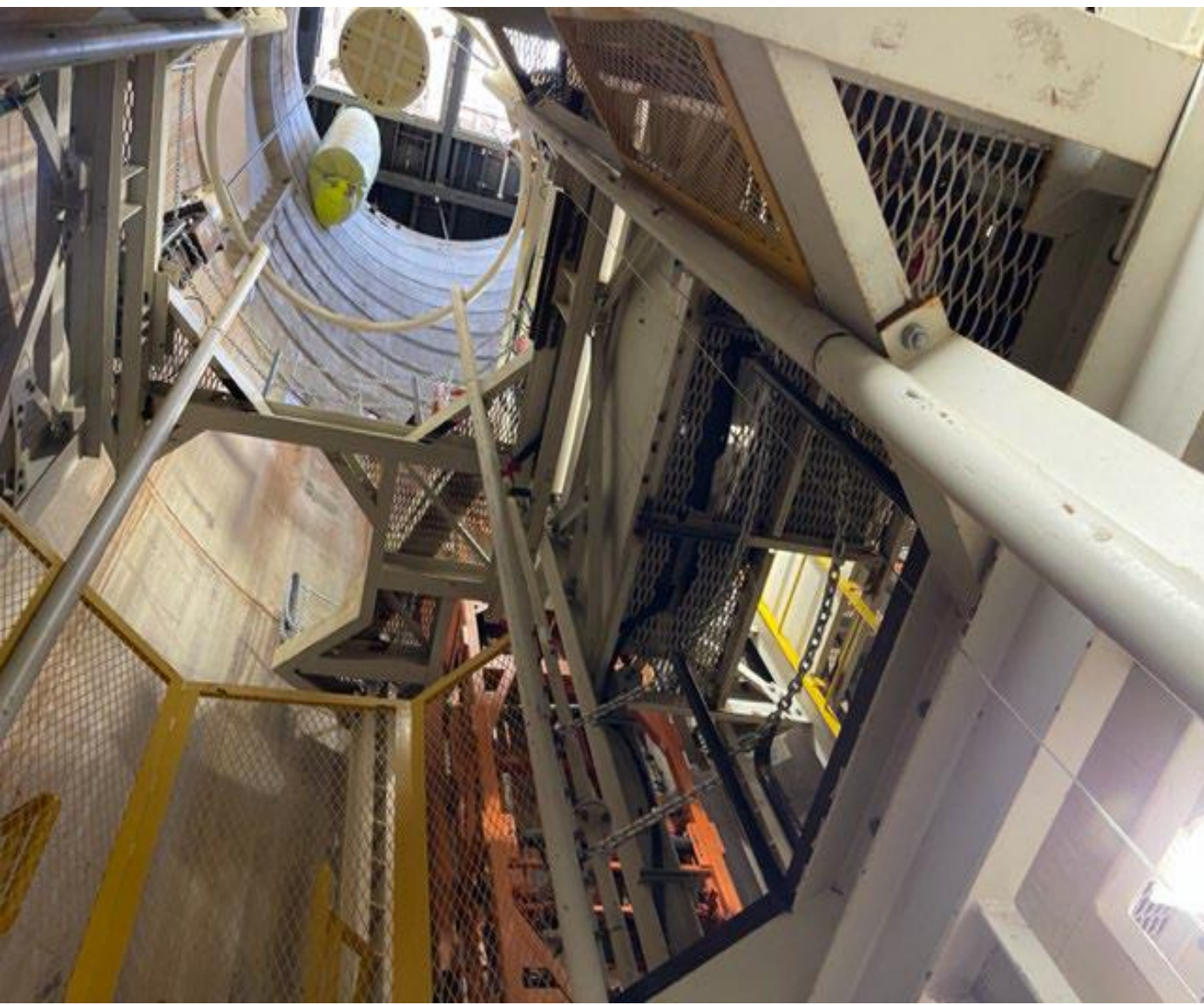


FY2022 PROGRESS ON THE UTILITY SHAFT (US)



Goals in FY2022

- ✓ Resume excavation of the Utility Shaft (re-started on 6/13/22)
- ✓ Complete procurements for design and fabrication of two large fans to be located on the surface on concrete slabs at the Utility Shaft
- ✓ Air Intake Shaft (AIS) Exhaust Shaft: complete structural construction of stack and associated ductwork and plenum (completed in May 2022)





Questions?