~9 ½ years of operation
6,849 shipments received
104,130 waste containers disposed
>56,000 cubic meters of TRU waste disposed
>8,000,000 loaded miles
~5 waste panels mined
~4 waste panels filled
13 storage sites cleaned of legacy TRU waste
22 consecutive years NM “Mine Operator of the Year”
0 releases to the environment
0 contaminated WIPP personnel

Through August 20, 2008
Transportation Update

Over 8 million loaded miles

Total shipments as of September 1, 2008

6,849

13 sites completed

WIPP – DOE Transuranic Waste Strategy & Future Packaging and Shipping Initiatives

RadWaste Summit 2009
New WIPP Transportation Carrier Contracts

2 private commercial carrier contracts awarded in 2007
- Small business set aside (Visionary Solutions)
- Unrestricted (CAST Transportation)

Only the safest drivers work for WIPP

Many Tri-State driver teams transferred to Visionary Solutions
WIPP Surface Facility Status

Photo: Oct. 2006
Each salt pillar left in place is about the same size as a football field.
RH Disposal Operations Began January 24, 2007
Through July 31, 2008
Panel 4 Waste Disposal Status

Through July, 2008

Pre-drilled RH boreholes

Abandoned RH boreholes

Emplaced CH waste

WIPP – DOE Transuranic Waste Strategy & Future Packaging and Shipping Initiatives
Success and safety are inseparable

Achieved Voluntary Protection Program recertification at the “Star” level
- January 2006

Achieved low injury rates
- 90% below national average
- 52% below DOE average

4 million safe work hours reached for the first time
- November 13, 2006

Achieved lowest recordable case rates
- 3.6 mining industry average
- 0.3 WIPP average
People and Equipment

- 40 tractor trucking fleet (2 private carriers)
  - 30 driver teams
- 112 shipping containers (84+15+12+1)
- 985-employee workforce:
  - 40 Carlsbad Field Office of DOE (CBFO)
  - 45 Carlsbad Field Office Tech. Assistance Contr. (CTAC)
  - 40 Los Alamos National Laboratory-Carlsbad (LANL-CO)
  - 70 Sandia National Laboratories-Carlsbad (SNL-C)
  - 630 Washington TRU Solutions (WTS) – M&O Contractor
  - 160 WTS subcontractors (records, security, environmental, information systems)
Mobile systems perform waste characterization at sites that lack equipment, and to supplement sites with their own facilities – cost effective program to keep the “pipeline” full.

Mature CCP systems currently deployed at:
- Savannah River Site (SRS),
- Idaho National Laboratory (INL),
- Los Alamos National Laboratory (LANL), and
- Oak Ridge National Laboratory (ORNL)
- Argonne National Laboratory (ANL): RH only

Mobile systems can characterize ~90-100 waste packages/week (3-4 shipments/week)

Most CCP employees based out of Carlsbad with TDY assignments ~1 year
Future Packaging and Shipping Initiatives

- Standardized packing guidelines for CH and RH waste
  - Incorporate into DOE Order 435.1
- Large boxed waste and TRUPACT-III
- Shielded RH packaging containers
  - Lead shielded containers for gamma emitting waste
  - Polyethylene shielded canisters for neutron emitting waste
New Shipping Container - TRUPACT-III

- Avoid repackaging large boxes into drums
- Inter-site shipping options
- Closely related to European Gemini

30-ft drop tests at -30 °F (Sandia Aerial Test Facility)

- NRC review → required new testing (Spring 2009), with license approval ~Fall 2009
Shipping Standard Large Box (SLB) in TRUPACT-III requires large box NDA and NDE equipment.
Shielded Containers for Packaging RH Waste

Fact:
Significant fraction of RH waste < ~10 R/hr

Problem:
RH shipment in RH-72B and emplacement in canisters in boreholes in disposal rooms is inefficient

Proposal:
Package RH waste with lower dose rates into shielded drums. Ship in CH casks and emplace along with CH waste in stacks on the floor of disposal rooms
Shielded Containers Approach

- Candidate waste streams to be characterized and certified under WIPP’s existing WAP/WAC as RH TRU waste (prior to shielding)
- New Mexico Agreements and requirements of the LWA for RH TRU waste will continue to be met
- All waste received in shielded containers (and in RH-72Bs/10-160Bs) will count against RH waste volume capacities
- RH-72B/10-160B shipments and canister disposal operations will continue
Shielded Containers - Approach (Continued)

- External dimensions = 55-gal drum, internal capacity for a standard 30-gallon drum
- Transport in 3-pack configuration in HalfPACT under current design and licensing bases:
  - 7,600 lb max payload
  - 30 watts max decay heat
  - 325 max Fissile Gram Equivalent (FGE) Pu
- Handling, storage, and emplacement in 3-pack configuration
- Incorporate into existing CH TRU waste handling infrastructure
Three 30-gallon drums in 3 HalfPACT casks/shipment results in three times the shipping efficiency of the 72B.
Every RH shipment to WIPP to date would have been suitable for shipping in shielded containers.
Gamma Shielded Container Conclusions

- Shielded containers are robust and safe alternatives to shipping RH-TRU waste in the 72-B cask.
- Shielded containers have no discernible impact on long-term repository performance.
- Estimated cost ~$5000
- Use of potentially contaminated material recycle lead may lower costs further
- HalfPACT license application under NRC review
- EPA reviewing planned change request
- Anticipated use ~Fall 2009
Polyethylene Shielded Canisters for Packaging Neutron-emitting RH Waste

Fact:
Significant fraction of RH waste contains neutron-emitting radionuclides, contributing to the dose rate

Problem:
RH-72B shipping casks do not shield neutrons. Neutron dose rates ~15 mr/hr at canister surface → 10 mr/hr at 2 meters, which exceeds DOT transport index limit

Proposal:
Package high neutron-emitting RH waste into polyethylene sleeves inside nominal RH canisters. Ship in RH-72B casks and emplace in boreholes in the walls of WIPP disposal rooms
**Neutron Shielded Canister Approach**

- Candidate waste streams to be characterized and certified under WIPP’s existing WAP/WAC as RH TRU waste (prior to shielding)
- New Mexico Agreements and requirements of the LWA for RH TRU waste will continue to be met
- Develop and test canisters fitted with polyethylene sleeves (two thicknesses) to accommodate 15-gallon and 30-gallon drums
- No external changes proposed to RH process can preclude EPA and NMED license/permit changes
Neutron Shielded Canister Approach (continued)

- Use **commercial** plastic tubing and **custom** end caps to reduce neutron dose rate to meet transportation limits
- Canister integrity will confine end caps and sleeve – precludes plastic welds
- Many canisters will result in contact dose rate <200 mr/hr (CH?), but will still be handled and emplaced as RH waste
- 200-300 neutron shielded canister required
- Drop testing inside mockup of RH-72B inner containment vessel required (~Spring 2009)
- NRC license ~2010
Final Thoughts: Underground Science in WIPP

- Multiple particle physics experiments
- 6-10 postdocs and graduate students
- WIPP provides infrastructure (e.g., power and access)
- Research teams pay their own way
TRU waste program is a complex effort involving multiple DOE sites, states, regulators, and oversight organizations.

WIPP faces regulatory and technical challenges, but continues to get the job done with excellence:
- Routine waste shipments
- Meeting and exceeding disposal goals
- Continuous focus to eliminate low-value procedures and reduce cost
  - means continuing significant permit/license changes
- Sterling safety and compliance record