WIPP Town Hall Meeting

Sponsored by the U.S. Department of Energy and the City of Carlsbad, NM

October 13, 2016
Agenda

- Opening Comments – Mayor Dale Janway
- Introductions – Tim Runyon (moderator)
- WIPP Status – Phil Breidenbach, NWP
- Status of WIPP Ground Control – John VandeKraats, NWP
- Questions and Answers
  - In house
  - Internet
Update on WIPP Activities
Phil Breidenbach, President & Project Manager

An AECOM-led partnership with BWXT and AREVA
WIPP Update

• Interim Ventilation System
• Management Self-Assessment
• Contractor Operational Readiness Review
• WIPP Fire Department
  - National Combat Challenge
• New exhaust shaft
• Ground Control introduction
• Rock fall is the single highest hazard to workers and the mission at WIPP
  • Improving ground control is our highest priority
  • We have made great progress but we still have work to do
• Where potentially unstable ground is identified, areas are closed and barricaded to prevent entry
• Falls that have occurred were in closed, barricaded areas,
  • These were expected and posed no danger to personnel, the mission, or the restart effort
• Safety of our workers is paramount and working areas of the mine are evaluated and determined to be safe prior to entry
WIPP Ground Control

John VandeKraats,
Sr. Technical Advisor

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Salt Geology

- Halite or “salt” is usually formed as the result of ocean water evaporating.
- The WIPP formation was formed as the result of what used to be the Permian Sea.
- WIPP is located in an approximately 2,000 ft. thick salt formation, beginning 850 ft. below the surface.
- At that depth salt “creeps” - which is a primary reason why the WIPP location was selected as a repository.
- Eventually, the salt will encapsulate the buried waste and permanently isolate from the biosphere.
• Salt “creep” on average closes openings at the rate of 2-5 inches per year
• Eventually, salt creep will close openings and permanently isolate the waste
Addressing Operational Challenges

• Maintaining openings requires constant effort
  • As part of the salt creep process, fractures will develop near openings
  • These must be monitored and controlled

• The Ground Control Program includes
  • Inspections
  • Instrumentation
  • Data Collection
  • Analysis
  • Results
Worker Inspections

- Workers inspect their work area before beginning each shift and on scheduled weekly inspections throughout the underground
  - Visual inspection
  - Physical inspection
Geotechnical Inspections

- Geotechnical Engineering perform inspections based on ground conditions
  - Weekly inspections are performed on all non-restricted/non-contaminated areas
  - Bi-Monthly/Monthly inspections are performed to collect data in restricted/contaminated areas using geomechanical instruments
- Accessible (non-prohibited) areas of the underground are graded on a bi-annual or annual basis depending on ground conditions
- Random inspections are performed when requested by Mine Operations
  - Employee observations and feedback
Instrumentation

• Instrumentation is installed throughout the underground

• Types of measurements
  o Convergence Points – measure the closure of underground openings
    • Typically installed approximately every 75ft. in main drifts
    • Installed in cross cuts based on ground conditions
    • Measurements made monthly, bi-monthly or as required
  o Extensometer Point – measures actual expansion and sag of roof beam
    • Typically installed in panel rooms and access drifts
    • Measurements typically made on weekly basis
  o Crack Meters – measure expansion of the width of a crack
    • Measurements typically made on a bi-monthly basis
**Geotechnical Analysis**

- Convergence points measure the closure of the roof to the floor
  - Spacing of the points through the mine is approximately 75 ft.
  - An increase in closure rate may indicate either increased roof beam sag (expansion) and/or floor heave

- **Wire Extensometers**
  - Extends 25 ft. into the back to measure roof beam expansion
    - An increase in rate of roof beam expansion may signal instability
• Reports
  • Weekly
    o Geomechanical Mine Stability Surveillance Report
  • Annual
    o Ground Control Annual Plan
    o GAR Geotechnical Analysis Report
Based on Ground Control Result we take the following actions

- Remediate the ground
  - Install bolts/mesh
  - Scaling ribs/roof
  - Mill/mine floor

- Control Areas
  - Restricted
  - Prohibited
Our Strategy to Protect the Workers

- Ground control priorities are established from information gathered and then categorized as High, Medium or Low. Sources include:
  - Evaluation of physical observations
  - Collection and analysis of geotechnical instrumentation data
  - Evaluation of the performance of installed ground support systems
  - WIPP-specific experience

- In addition, we factor in where people are routinely located

- Areas where ground control does not meet standards are controlled (restricted or prohibited)
Controlled Underground Areas

- Restricted areas have controlled access due to ground control concerns
- Access to these areas is limited to:
  - Geotechnical Engineering (inspections and taking instrument readings)
  - Mine Operations (bolting and inspections)
  - Personnel requiring access to perform essential duties must be accompanied by a qualified individual(s) capable of recognizing ground control hazards

- Prohibited areas have been barricaded to prevent entry due to potential imminent hazards
- Personnel may not enter a Prohibited Area

Contact Mine Operations Manager via Mine Phone

CAUTION

RESTRICTED ACCESS
GROUND UNDER EVALUATION

Contact Mine Operations Manager via Mine Phone

DANGER

DO NOT ENTER RED AREA
Ground Control Status

- Radiological release event in February 2014
  - Prevented ground control activities for nine months
  - Required “catch-up” bolting in areas of the underground that could not be maintained during that period
  - Created radiologically contaminated areas
    - Required protective clothing and respirators
    - Complicated all operations including ground control and other support activities
- Recovery efforts are now focused mainly in the radiologically contaminated areas
Recent Rock Falls in Controlled Areas

• Panel 3 exhaust drift
  o This drift was restricted in 2013
  o Initial fall was discovered on January 19, 2015
  o The area was then prohibited
  o Subsequent falls were discovered on February 3 and October 3, 2016 in the prohibited area
  o Restricted November 4, 2014 and prohibited February 23, 2015
  o This area did not have any ground support installed

• Panel 4 inlet drift
  o Area was restricted in March 8, 2016
  o Area was prohibited on September 13, 2016
  o Initial fall discovered September 9, 2016
    • Additional fall discovered September 27, 2016
  o Initial roof/wall fall occurred, causing damage to the bulkhead
  o Subsequent fall later occurred in same area

• Panel 7, Room 5
  o Restricted April 5, 2016
  o Unstable ground was identified
    • Mining equipment was used to bring the ground down
    • Part of normal mining operations
Conclusion

• We are committed to safe operations at WIPP
  • Changes in radiological conditions resulting from the 2014 event have made ground control much more difficult
• Our highest priority is improving ground control conditions and we have taken aggressive actions
• We have a robust ground control monitoring program and process in place to protect workers
Questions & Answers