Introduction – Captain Jack Mill Superfund Site

• Remedial Design/Action (RD/RA) Project Team
  – CDM Smith; Engineering Design and Construction Administration
  – Colorado Department of Public Health and Environment; Lead Regulatory Agency
  – U.S. EPA Region 8; Supporting Regulatory Agency
  – Boulder County; Supporting Local Agency
  – Colorado Cleanup Corporation; Remedial Action Contractor

• Previous RI/FS & ROD
  – Nature & Extent of Contamination
  – Selected Remedy

• RD/RA Discussion Summary
  – Site Conditions
  – Design Approach
  – Construction Activities
Site Location & Layout

[Map showing the site location and layout with markers for Big Five, Captain Jack, Left Hand Creek, and others.]
Site Conditions - Big Five Mine Dump

Erosion (Head-cutting), Stormwater & Adit Discharge (Infiltration), Direct Exposure
Site Conditions - Black Jack Adit & Captain Jack Mill

Former Mill & Tailings Ponds & Adit, Direct Exposure, Boulder County Borrow Area
Site Conditions - Residential Property & Philadelphia Mine

Erosion, Direct Exposure
Site Conditions – White Raven Mine

Erosion, Direct Exposure
Pre-Design Investigation

• Additional Data Collection to Support Design
  – Geotechnical properties of mine waste
  – Geotechnical/agronomic properties for borrow material characteristics and volumes
  – Additional mine feature assessment (Cornucopia and Philadelphia Mines)
  – Additional structural/features assessment including culverts, Mill building, debris volume, ACM, and septic system
  – Additional cultural resource assessment

Team Subcontractors: Geocal Inc., Advanced Terra Testing, Pinyon Env. Engineering, SWCA Env. Consultants, CSU Soils Laboratory
Remedial Action Overview

• Remedial Action Objectives
  – Reduce Exposure to Metals in Soil (Arsenic, Lead, and Thallium)
  – Reduce Metals Loading to Groundwater from Surface Sources
  – Reduce Instream Surface Water Metals Concentrations
  – Remedial Goal: Lead in Soil < 380 to 860 mg/kg (Area Specific)

• Selected Remedy (2008 Record of Decision)
  – Adit Water Diversion
  – Removal of Mine Waste from Various Site Sources and Consolidate and Cover Mine Waste at the Captain Jack Repository
  – Regrade and Cover Mine Waste at Big Five Mine Dump
Remedial Action Overview

• Additional Reclamation Components
  – Structure demolition
  – Extend Black Jack Portal
  – Sedimentation basins for adit water diversion system
  – Run-on and runoff controls at repositories
  – Cover systems - 12” subsoil and 12” growth media
  – Restoration of excavated and disturbed areas
    • 4-6” growth media, seeding, erosion controls
    • Parent ground reclamation
    • Willow and tree plantings
  – Residential property septic system replacement
  – Culvert replacement
Design Approach - Big Five Mine Dump

Divert Adit Discharge, Regrade 3H:1V (16,000 CY), Install Soil Cover
Design - Black Jack Adit & Captain Jack Mill

Regrade Tailings Pond, Extend Portal, Consolidate Mine Waste (46,000 cy), Borrow Source, Install Soil Cover
Relocate Residents, Remove Debris, Remove Mine Waste (6,000 cy), Restore Property
Design – White Raven Mine

Remove Mine Waste (12,000 cy), Restore Property
Remedial Action – Big Five Mine Dump

Excavation and regrading mine waste, 2 ft soil cover
Remedial Action – Big Five Mine Dump

Run-on control; adit drainage ponds and discharge piping
Remedial Action – Big Five Mine Dump

Access and runoff controls
Remedial Action – Big Five Mine Dump

Runon controls
and
cornucopia
mine
reclamation
Remedial Action – Captain Jack Area

Portal extension and lime amendment
Remedial Action – Captain Jack Area

Mill demolition, mine waste consolidation, borrow material preparation
Remedial Action – Captain Jack Area

Mine waste consolidation and 2-ft soil cover
Remedial Action – Captain Jack Area

Run-on controls
Remedial Action – Captain Jack Area

Runoff controls
Remedial Action – Captain Jack Area

Erosion controls and seeding
Remedial Action – Residential Property

Mine waste removal, culvert replacement, septic system replacement
Remedial Action – Philadelphia Mine Dump

Mine waste excavation, parent ground amendment, slash placement
Remedial Action – Philadelphia Mine Dump

Erosion control and seeding
Remedial Action – Residential Property & Philadelphia

Property Restoration – Growth media placement, seeding, erosion controls, sod, tree planting, willow stakes
Remedial Action – White Raven Mine

Mine waste removal; adit portal structural restoration and gate
Remedial Action – White Raven Mine

Restoration – Fill and rock placement, erosion controls, seeding