



**Fermi Long Baseline Neutrino Facility (LBNF)
Far Site Conventional Facilities (FSCF) Project**

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**Sr. Project Manager
Commercial Manager**

University of Illinois - Urbana Champaign
BS Civil Engineering - 1991

- Working in Construction Since 1987
- 15 Years with Kiewit companies
- Alternative Delivery Projects
- Design-Build
- CMAR / CM/GC
- ECI

*Pre-Construction Manager / Commercial
Manager on the Fermi LBNF Project*





ESTABLISHED IN
1884

\$12.5
BILLION
IN 2020 REVENUE

2,000+
ENGINEERS
& DESIGN PROFESSIONALS

WORK ON SOME OF
NORTH AMERICA'S
**LARGEST &
MOST SIGNIFICANT
PROJECTS**

MORE
OPPORTUNITIES
FOR
GROWTH

Long Baseline Neutrino Facility (LBNF) **Far Site Conventional Facilities (FSCF) Project**

Presentation

1. LBNF / DUNE Overview –
 - The Purpose
 - The Program & Projects
 - The Stakeholders

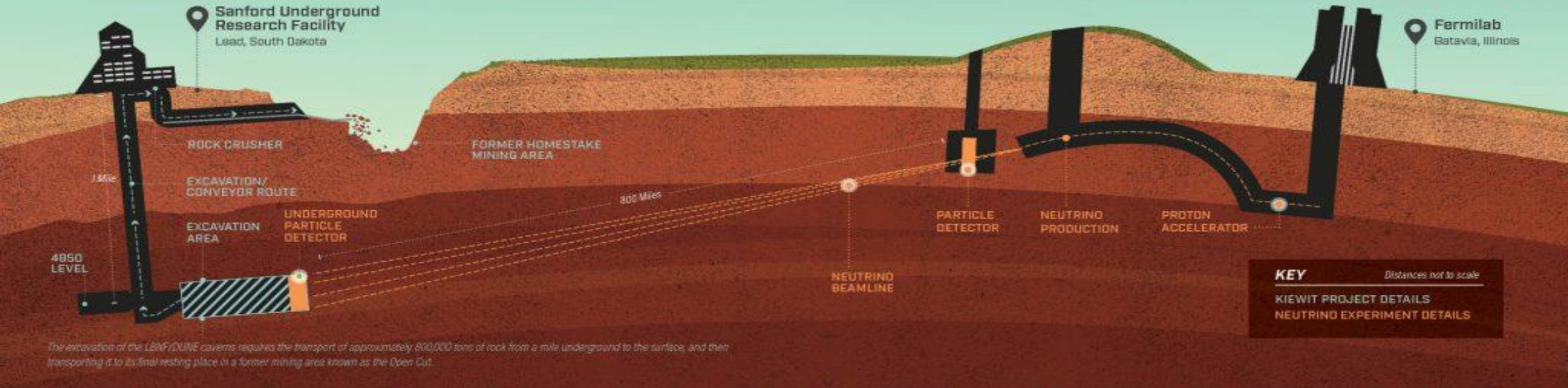
2. LBNF Far Site Project Overview & Tour –
 - Kiewit – Alberici AJV Role / Project Phases
 - Pre-Excavation work (Complete)
 - Excavation Work (EXC) – Ongoing

3. Questions

What is the Deep Underground Neutrino Experiment (DUNE)?

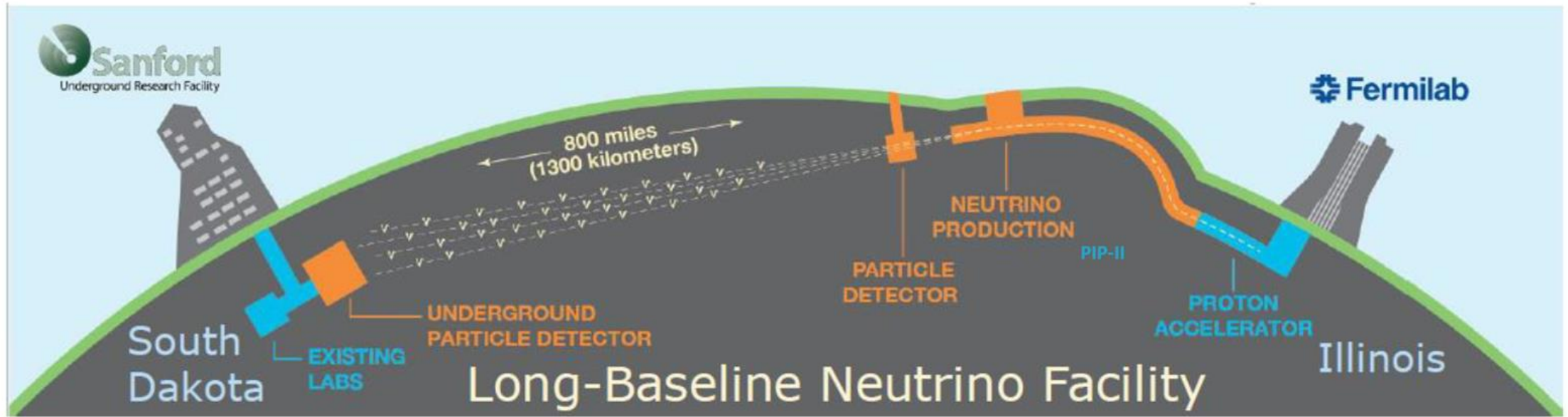
The Deep Underground Neutrino Experiment (DUNE) is a leading-edge, international experiment for neutrino science and proton decay studies. Discoveries over the past half-century have put neutrinos, the most abundant matter particles in the universe, in the spotlight for further research

into several fundamental questions about the nature of matter and the evolution of the universe — questions that DUNE will seek to answer. For more information, visit lbnf-dune.fnal.gov.



What is the project?

DUNE, LBNF – Near Site, **LBNF Far Site?**



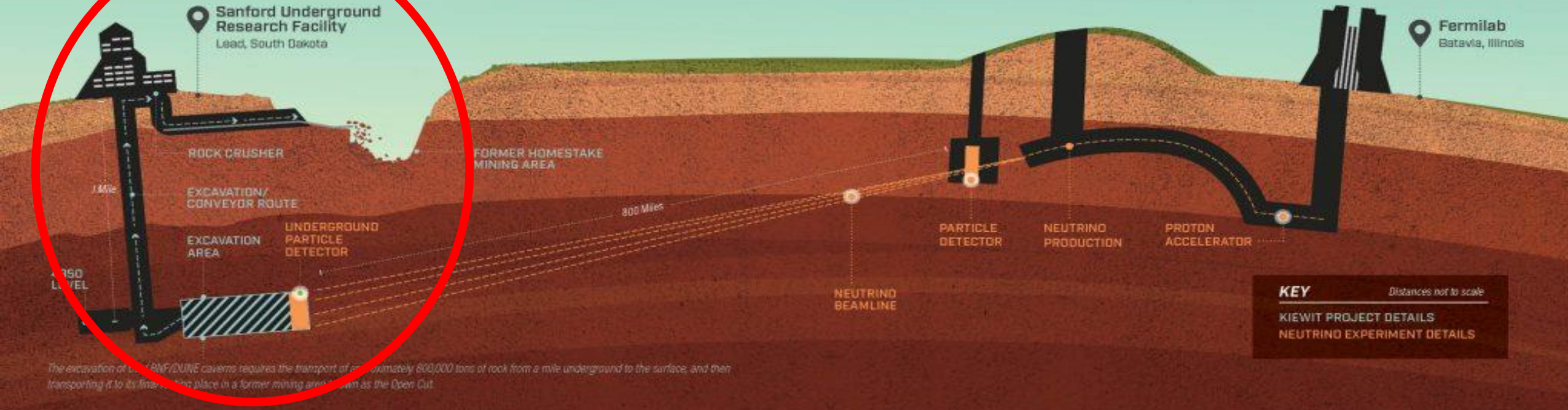
- **Long Baseline Neutrino Facility** – Platform to support the Deep Underground Neutrino Experiment (DUNE), provides:
 - Facilities at Fermilab, the “**Near Site**,” to produce world’s most intense neutrino beam and support the DUNE near detector
 - Facilities at the surface and 1.5 km underground at the Sanford Underground Research Facility (SURF), the “**Far Site**,” to support the DUNE far detector modules
- **DUNE-US** – U.S. contribution to the international DUNE experiment.

LBNF + DUNE-US are one DOE O413.3B Project

What is the Deep Underground Neutrino Experiment (DUNE)?

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Fermi – Long Baseline Neutrino Facility – Far Site

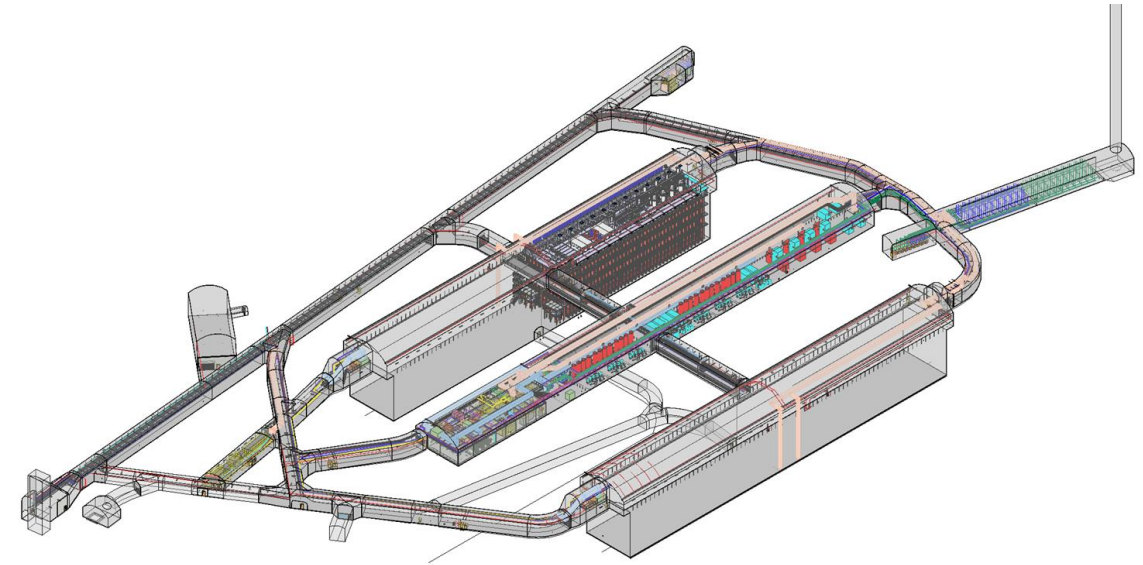
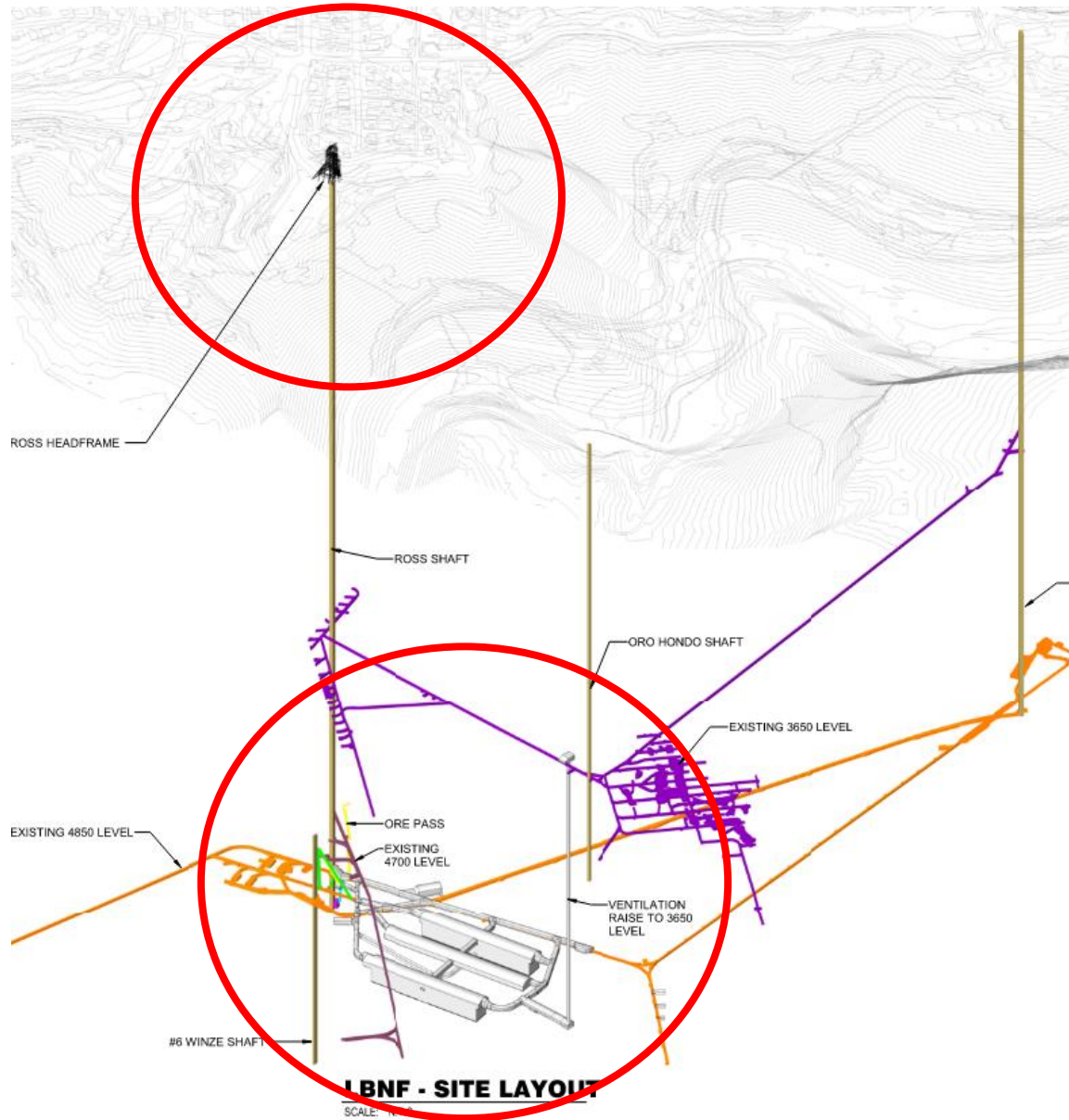
- Substantial rehabilitation, repair and refurbishment to historic Homestake mine – Lead, SD
- Three massive caverns nearly a mile underground
- Four four-story particle detectors, each containing 17,000 tons of liquid argon

| Fermi – Long Baseline Neutrino Project – Far Site

- \$205M Project (current value) for Fermi Research Alliance (CM/GC Services, Pre-Excavation)
- \$204M – EXC Contract – Excavation (In Progress - 2023)
- \$150M – BSI Construction Phase – Building Site & Infrastructure (2024-26)
- Phase 2 – Option (Detector Construction) (CM/GC Contract Option)

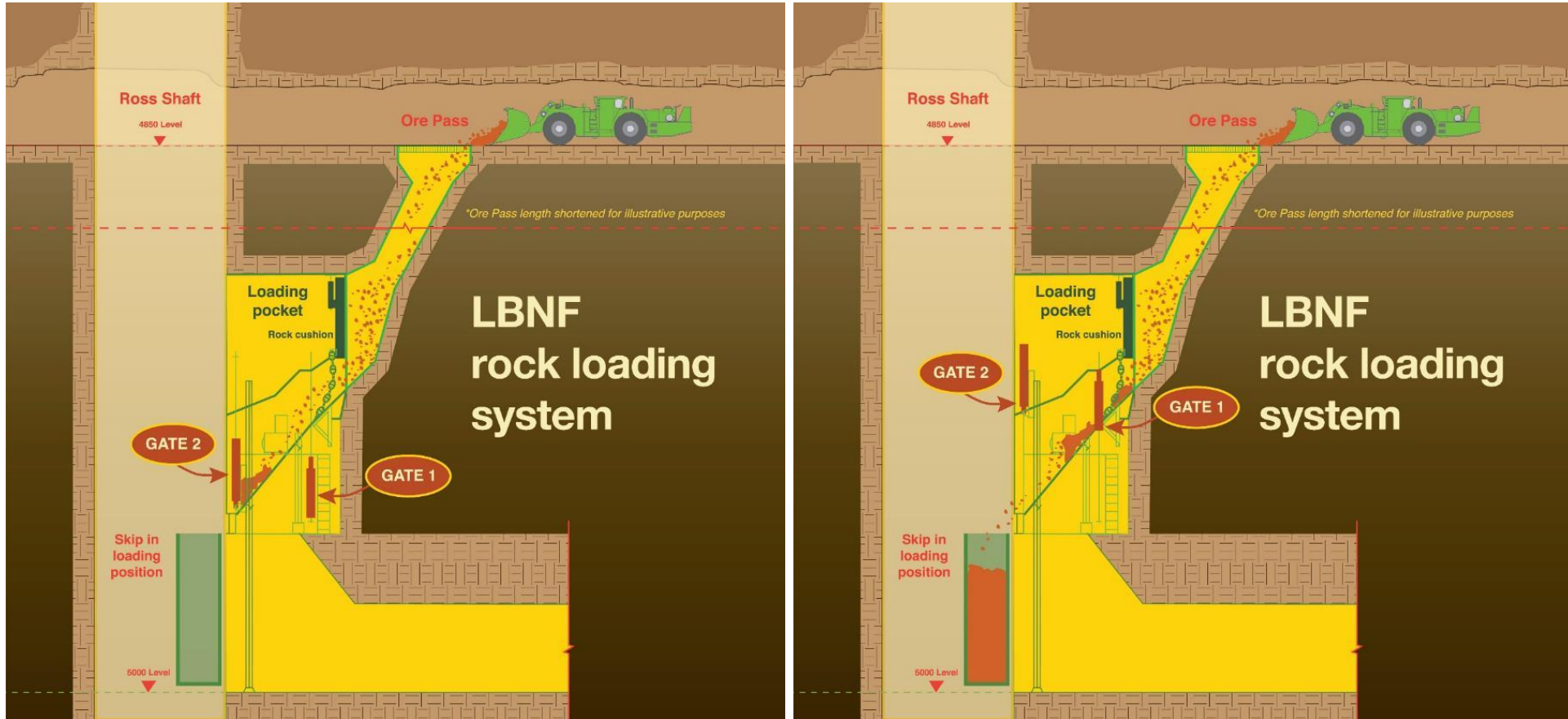


Fermi - Long Baseline Neutrino Project - Far Site



LBNF Detector & Central Utility Caverns

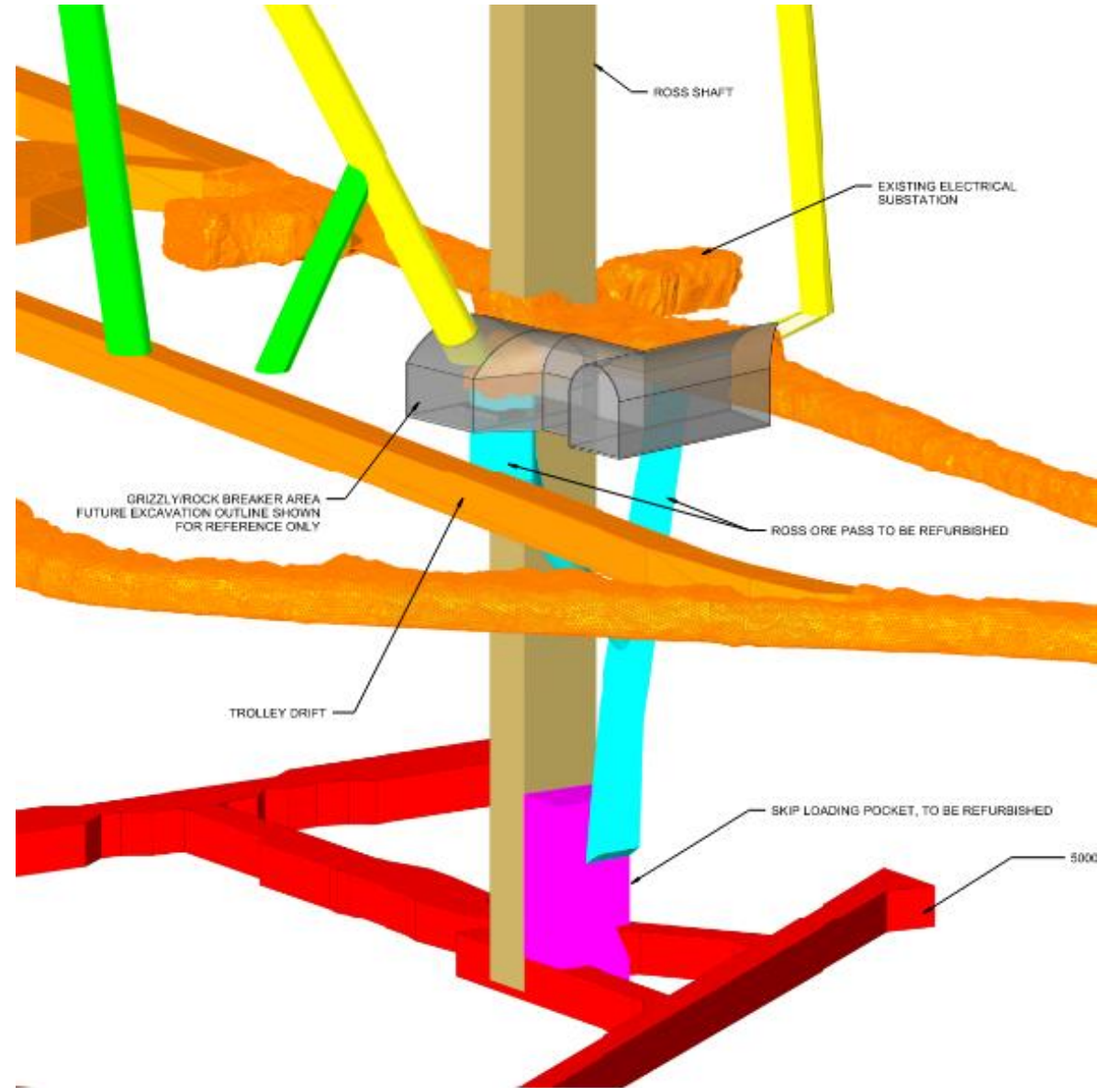
Skip Loader – Pre-Excavation Phase



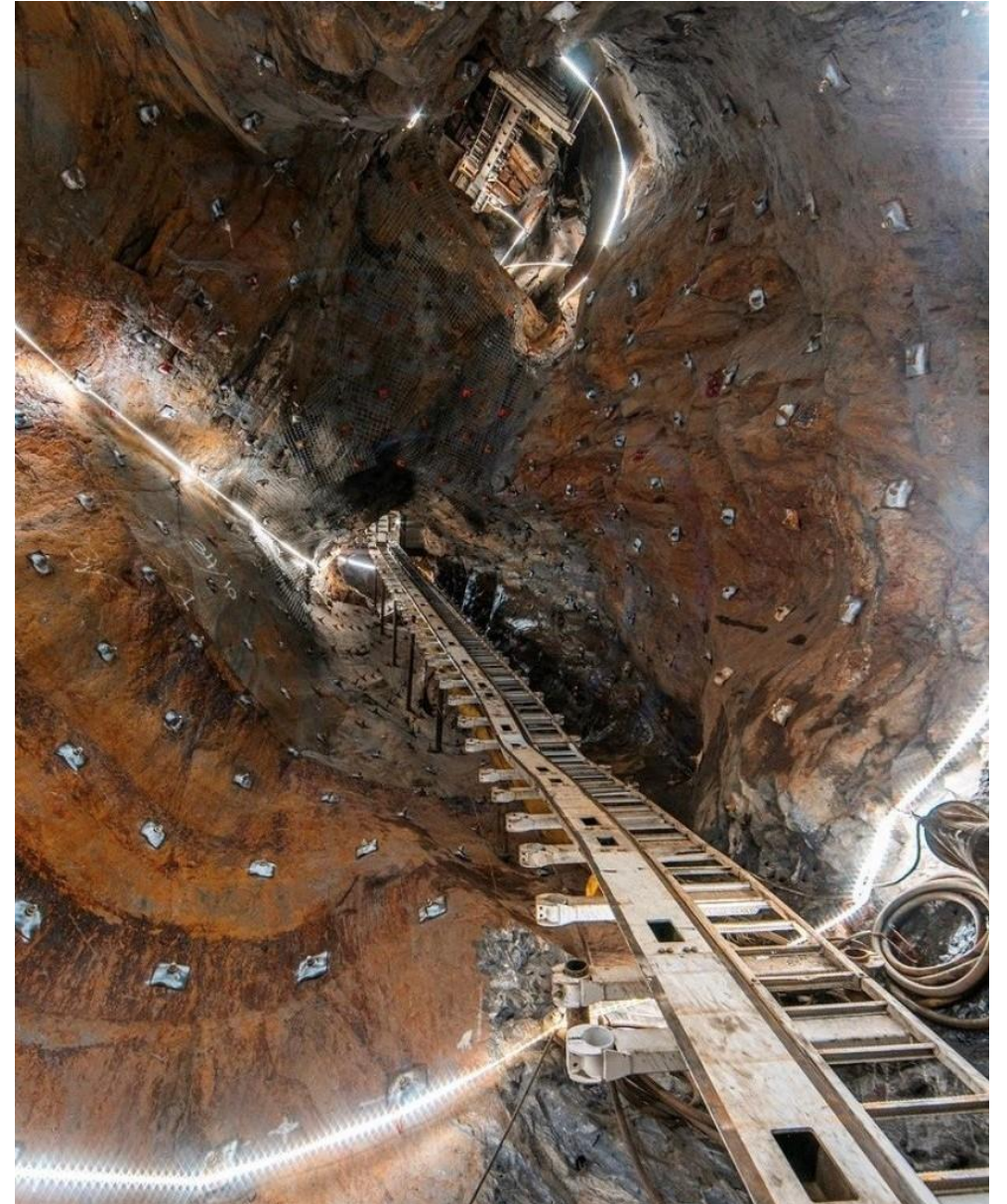
| Skip Loader – Pre-Excavation Phase



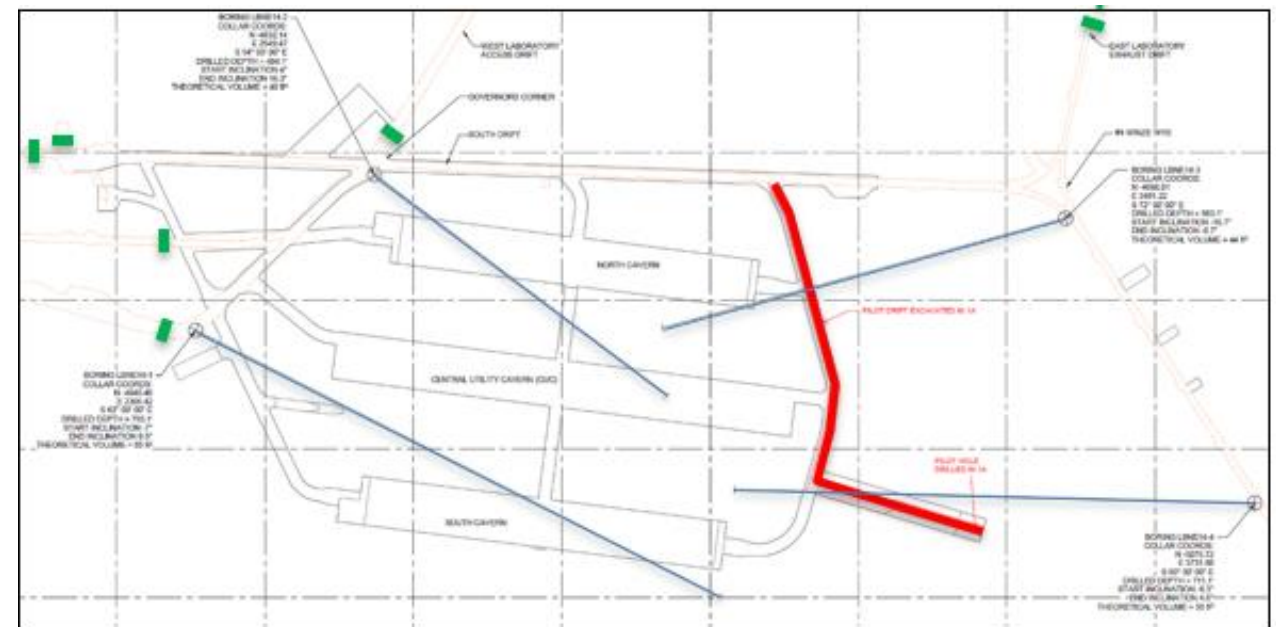
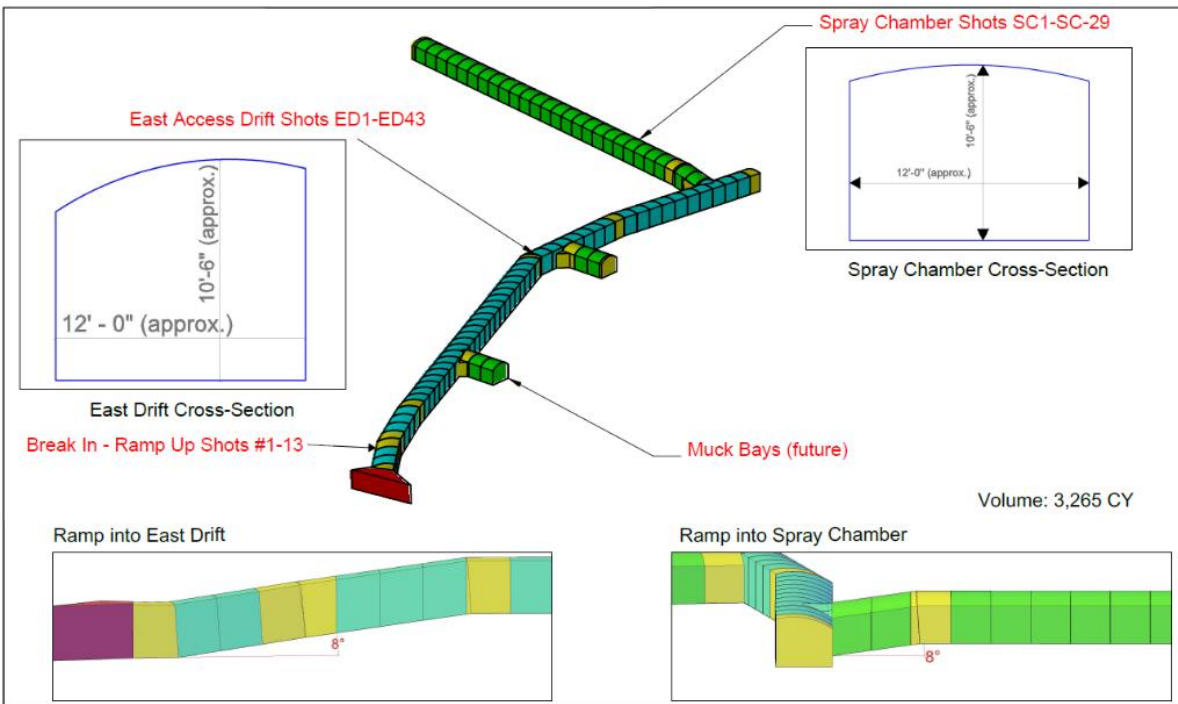
Skip Loader – Pre-Excavation Phase



| Ore Pass – Pre Excavation Phase



Pilot Tunnel Excavation – Pre Excavation Phase



- Blast Door
- Geotech hole to grout
- Pilot Drift

| Pilot Tunnel Excavation – Pre-Excavation Phase



| Blast Door Installation – Pre-Excavation Phase



| 3650L – Pre-Excavation Phase

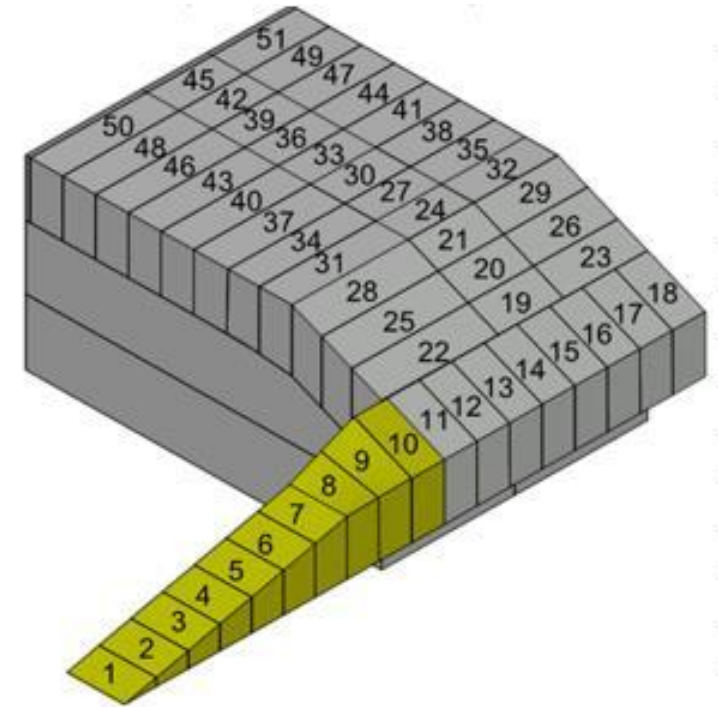
Before



After



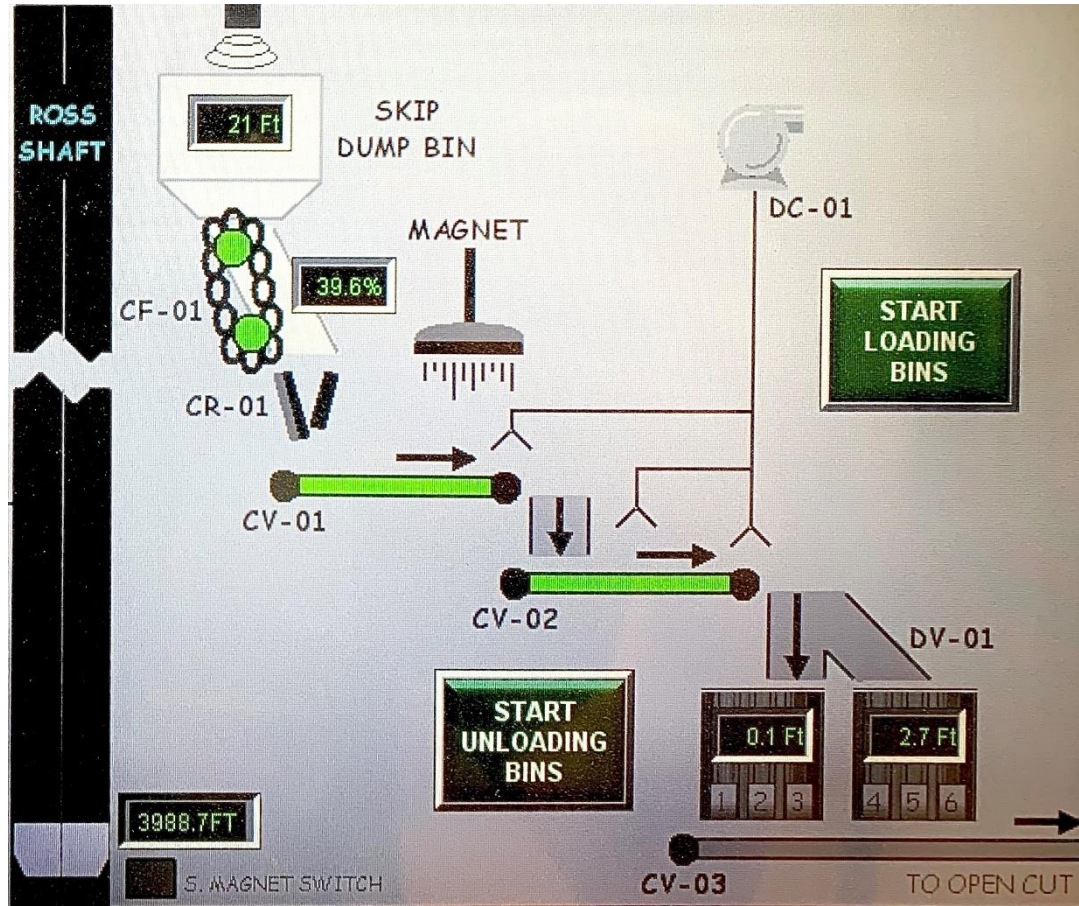
3650L – Pre-Excavation Phase



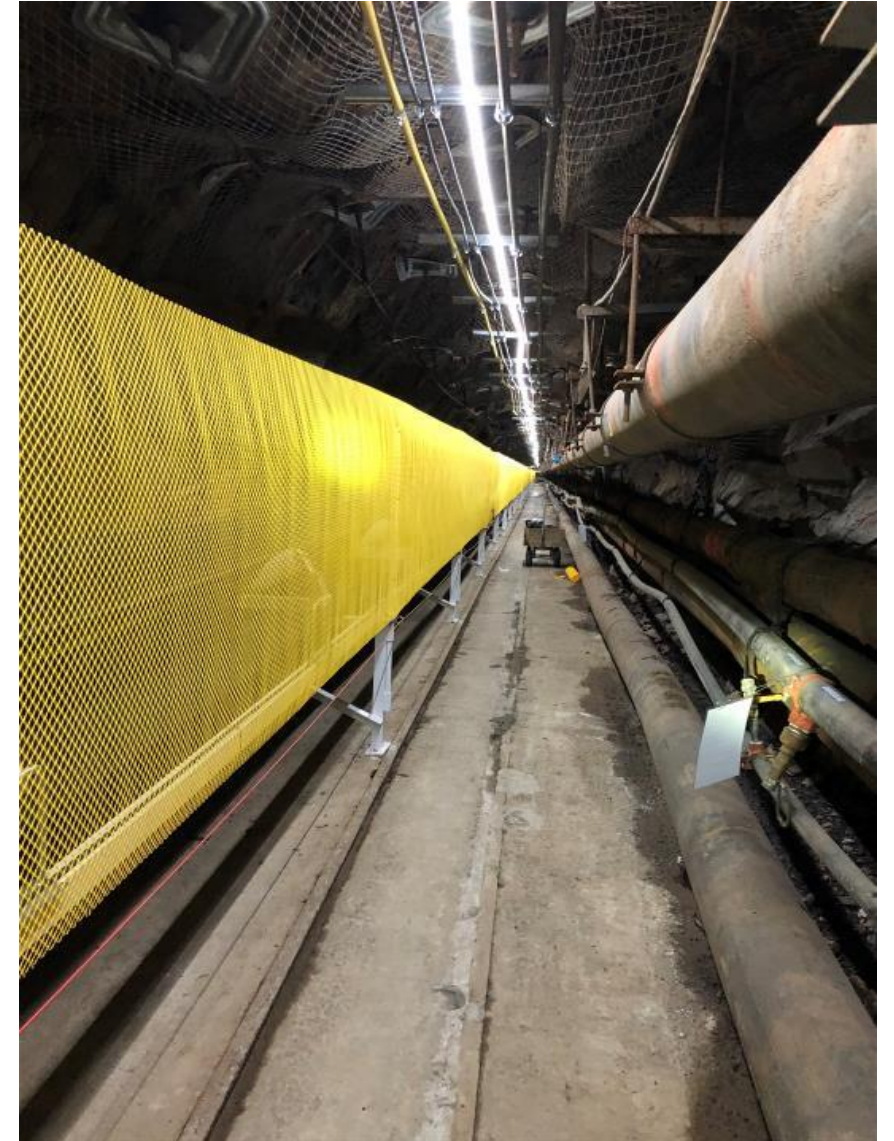
Headframe Abatement and Reinforcement – Pre-Excavation Phase



Crusher System – Pre-Excavation Phase



| Conveyor – CV-03 – Pre-Excavation Phase



Conveyor – Transfer Point – Pre-Excavation Phase



Conveyor – CV-04 – Pre-Excavation Phase



| Conveyor – CV-04 – Pre-Excavation Phase



| EXC - Excavation Phase Status

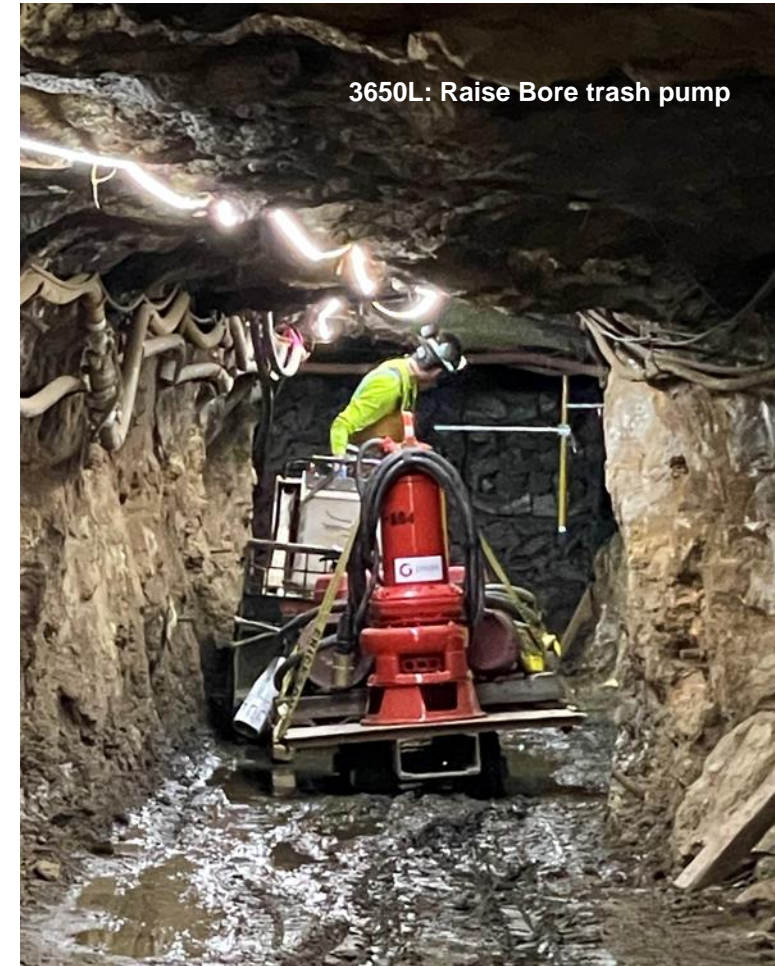
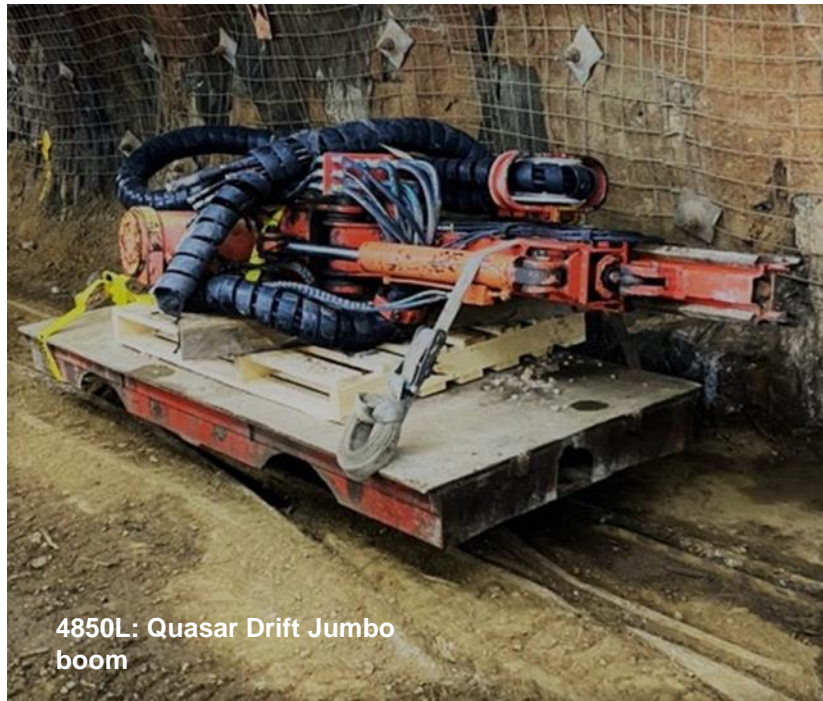


THYSSEN MINING
local challenges | GLOBAL SOLUTIONS



| EXC - Excavation Phase Status

- Equipment lowered (incl. slung loads by SDSTA) and re-assembled:
 - Raise Bore machine
 - Skid Steers, Bobcats, Crete Rod
 - Quasar Drift Jumbo
 - Sandvik DS311 Bolter



EXC - Excavation Phase Status – Raise Bore Pilot



Raise Bore video clip 060821.MOV



- Start date: 5/27/2021
- Best advance rate: 70 ft/day
- Cumulative advance: ~400 ft
- Slower in the rhyolite
- Completion: July, 2021

| EXC - Excavation Phase Status

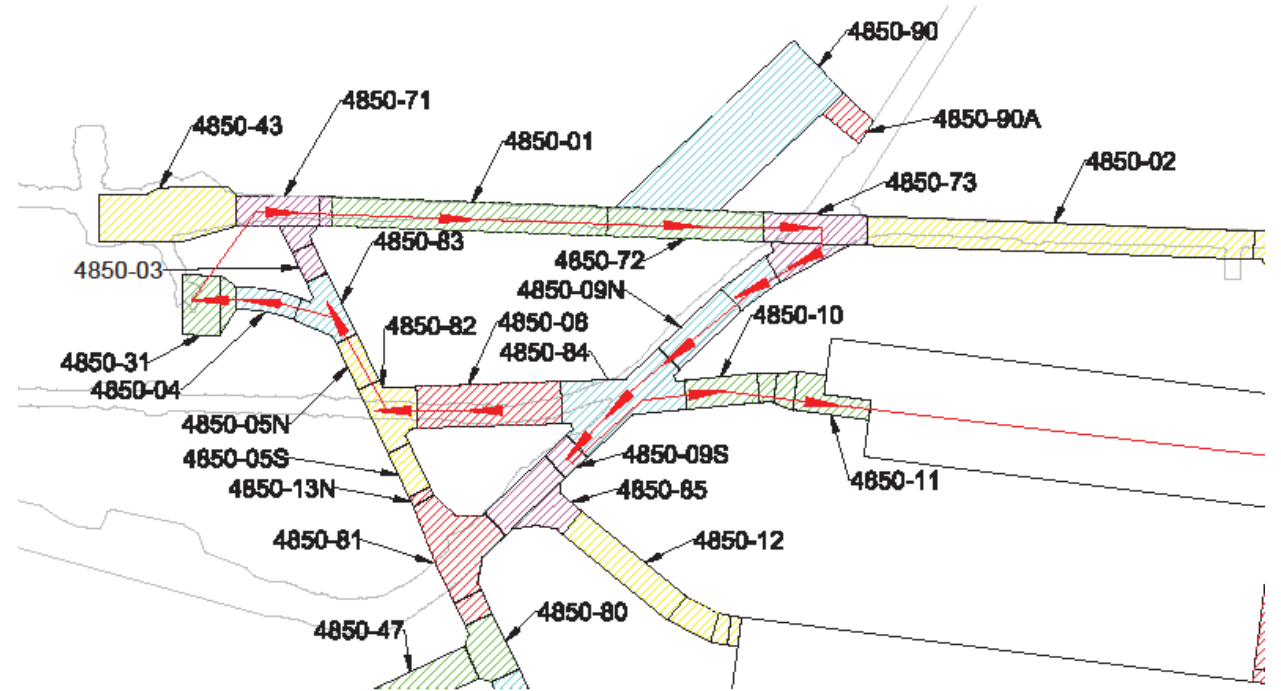
- Pre-production readiness:
 - West Drift mucking to Temp. Grizzly has started
 - Rock Handling System training
 - Shotcrete trials and nozzlemen certifications
 - Test blast, 4850L Trolley Drift: June



Open Cut: conveyor discharge

| Excavation Phase

- Raise Bore pilot hole completion – July, 2021
- Raise Bore reaming – June to November, 2021
- Ross Brow excavation – August to September, 2021
- North Cavern excavation start - October/November, 2021



“Goose Egg”

- Project “Goose Egg”
 - Nobody Gets Hurt – Entire Project





QUESTIONS & THANK YOU!

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