



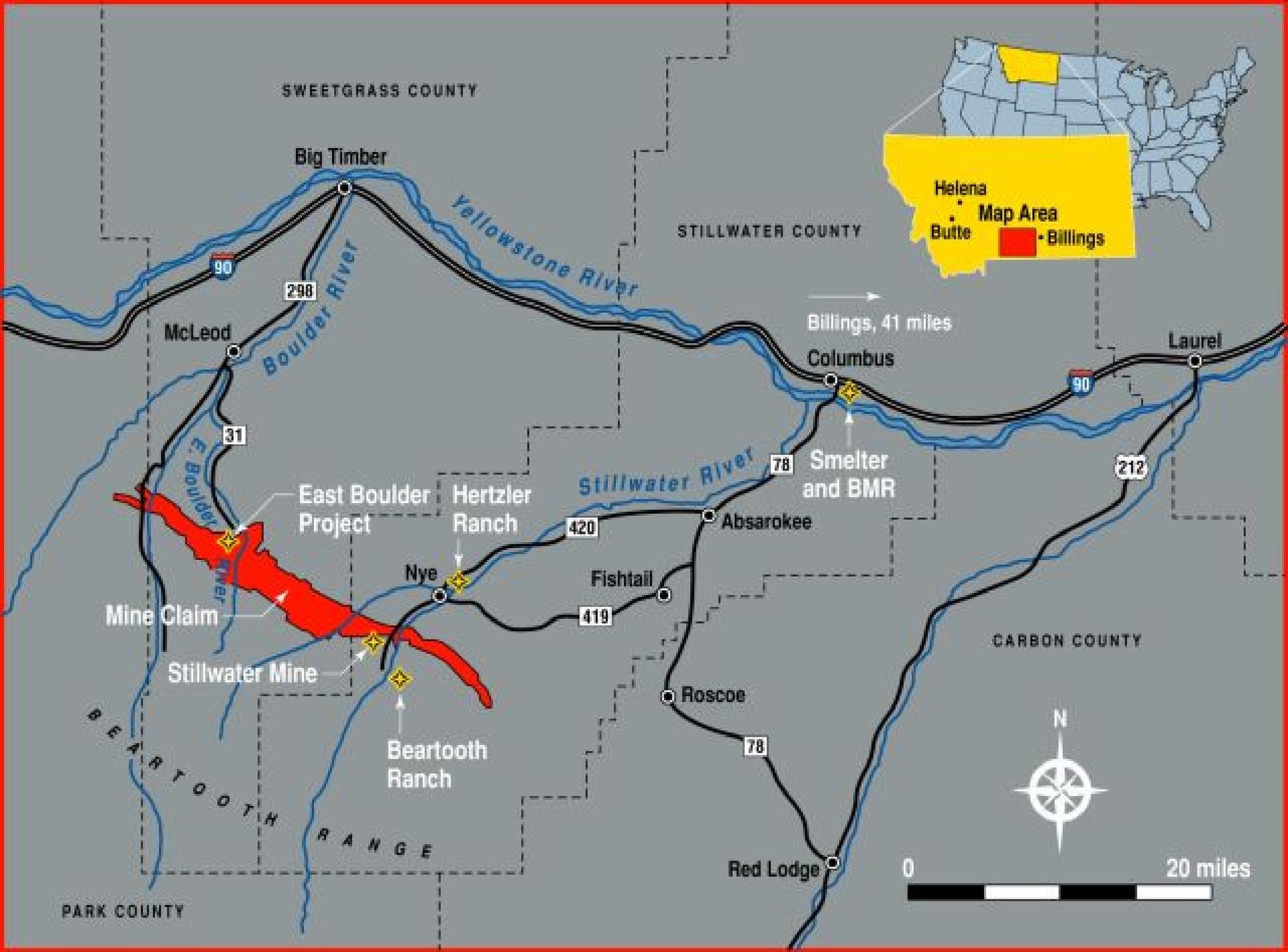
Stillwater Mine Noise Reduction Plan





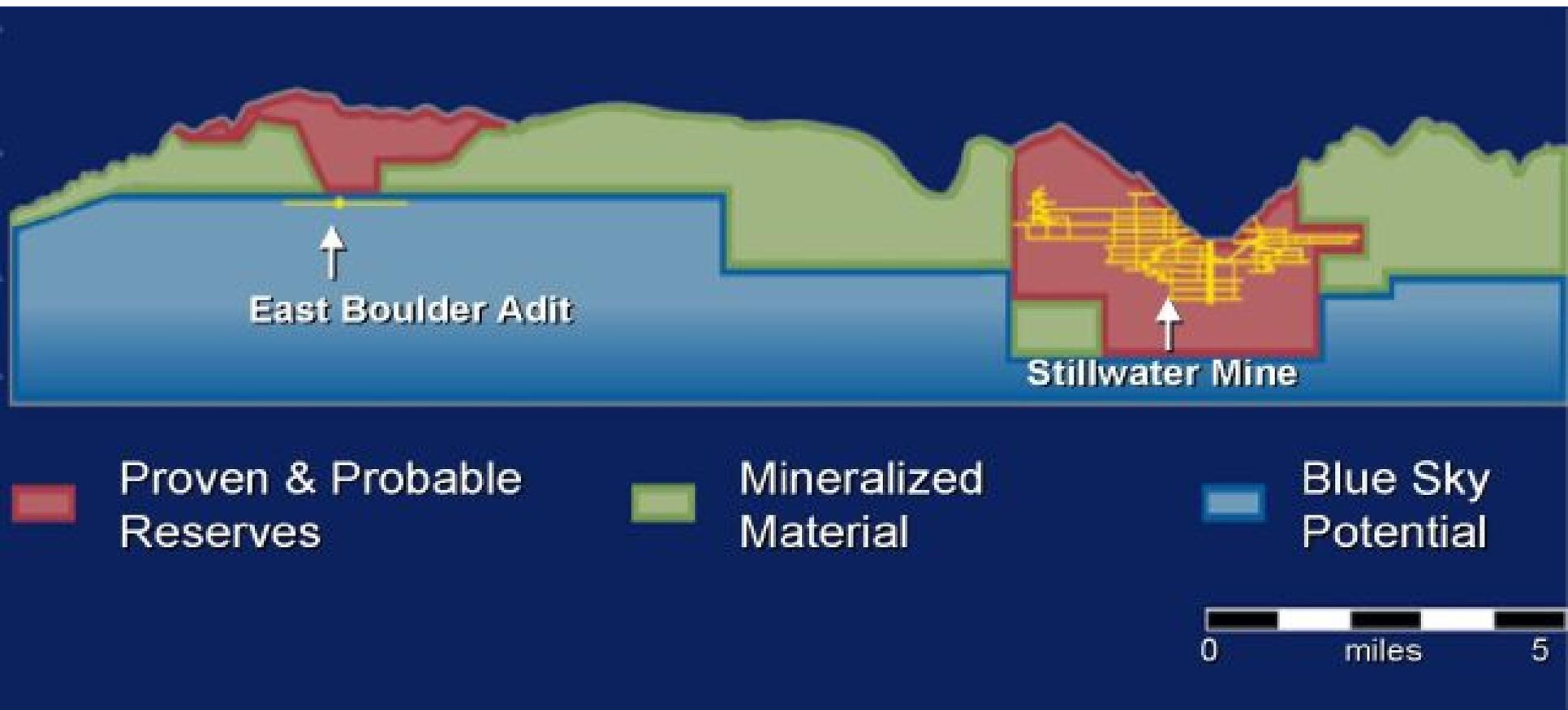
Topics

- Introduction
- Stillwater Mine Overview
- Noise Reduction Plan
 - Muck Haul
 - Drills
 - LHDs
 - Locomotives
 - Utility Fleet



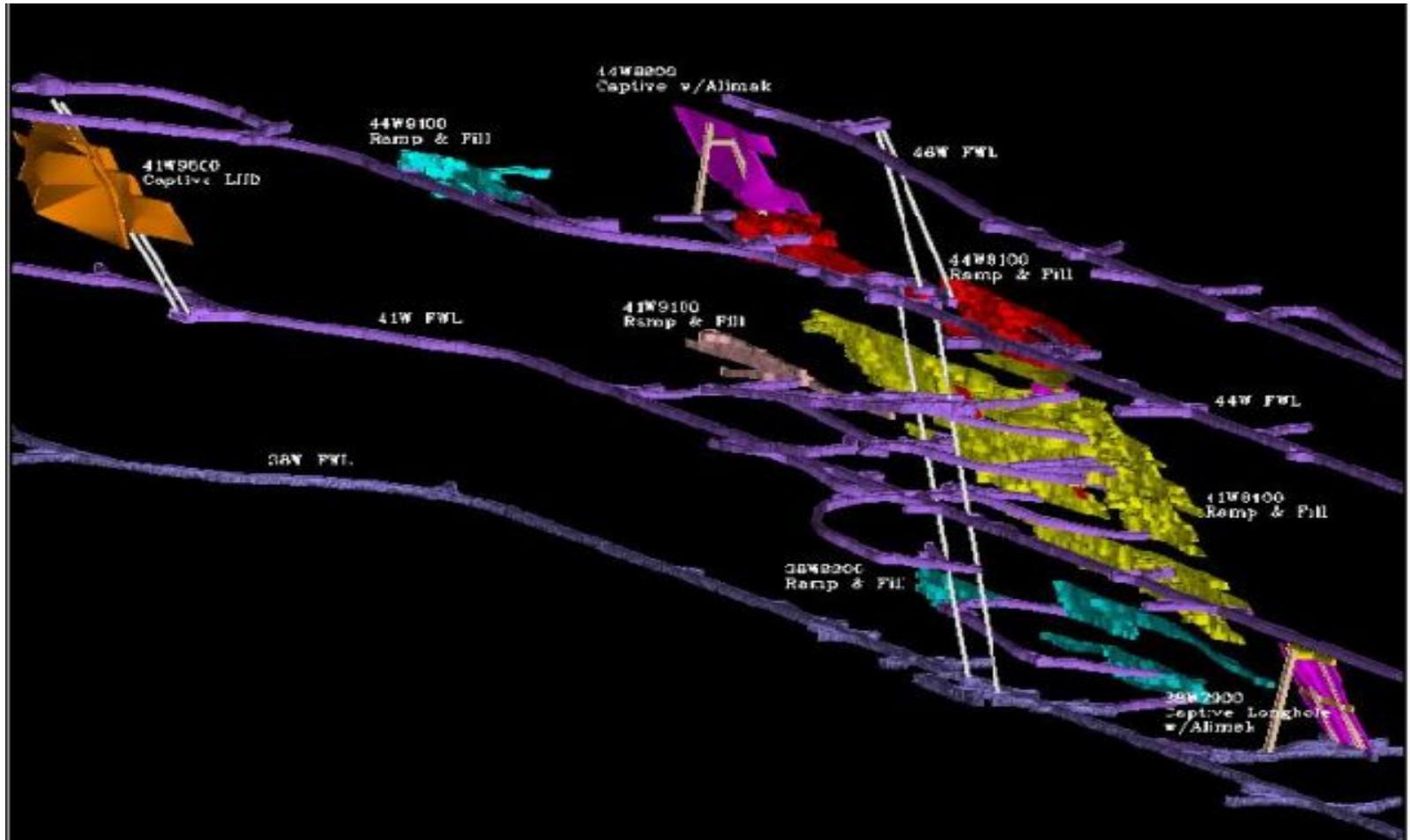


J-M Reef: 28-Mile Long Strike Length



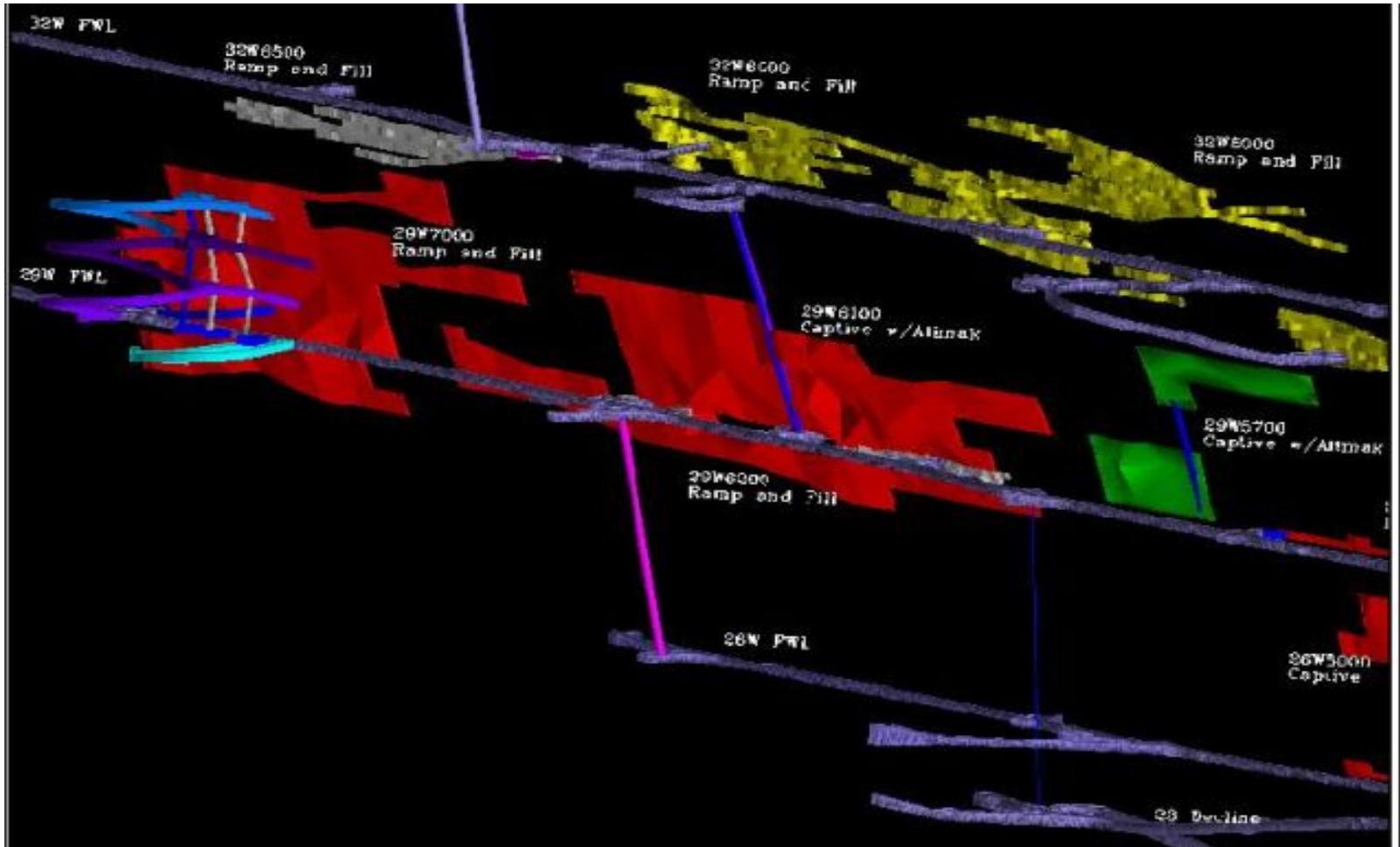


Upper Offshaft Stopping Area



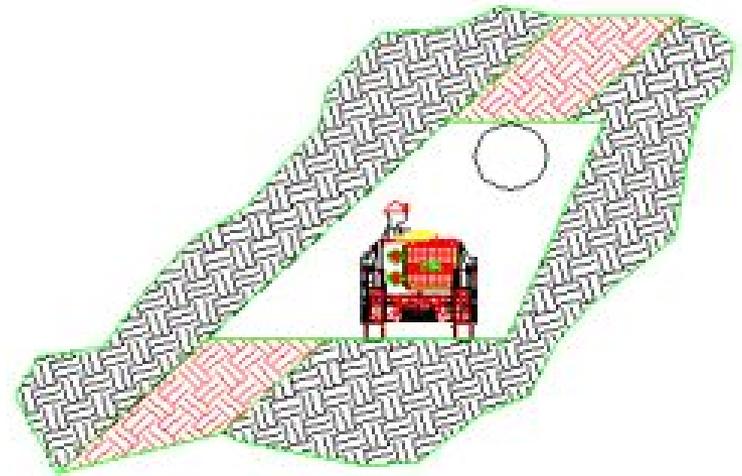
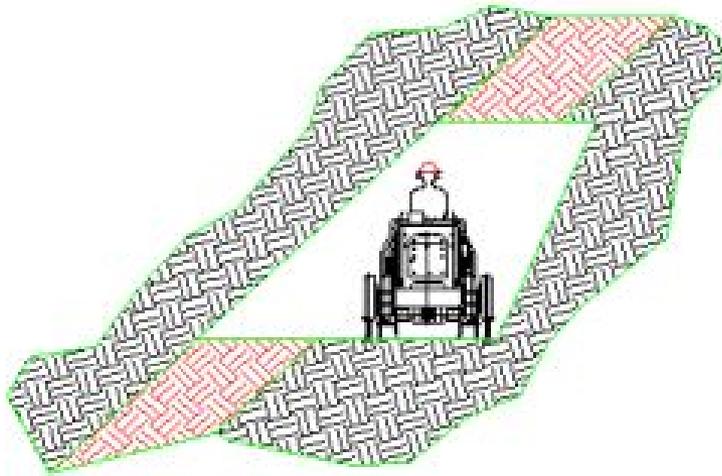
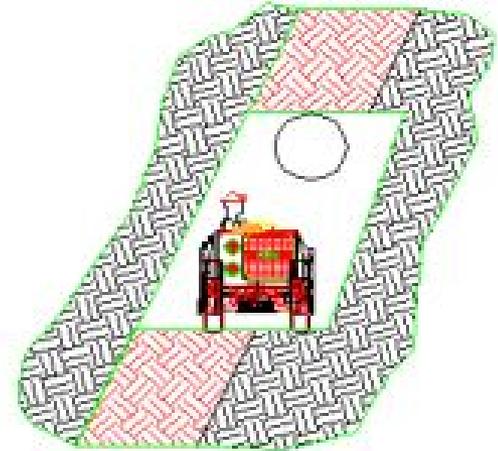
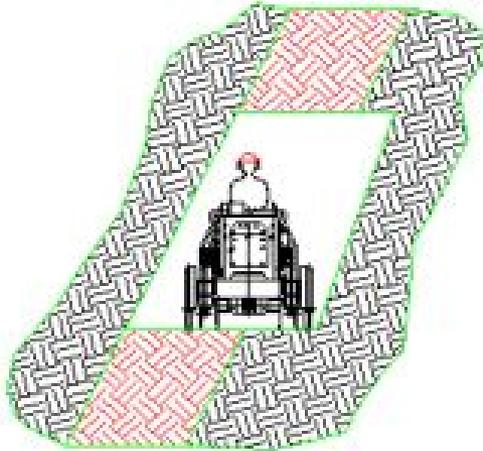


Lower Offshaft Stopping Area





Geometric Challenges





Typical Stope





Noise Reduction Plan – Muck Haul





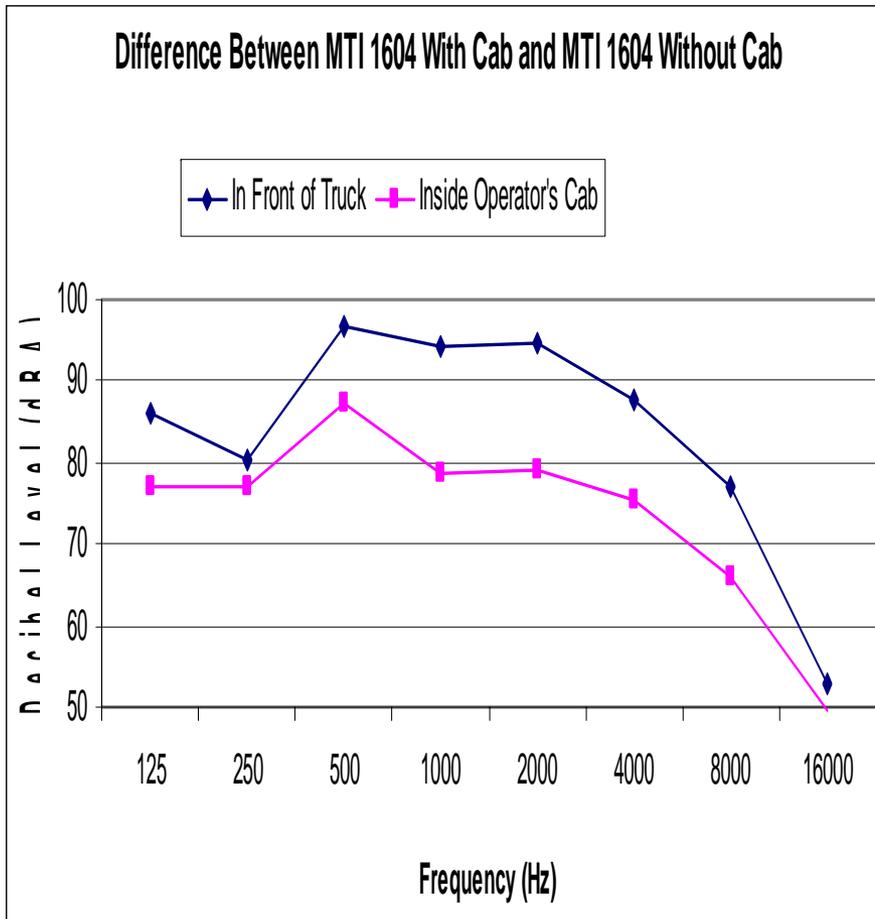
Noise Reduction Plan – Muck Haul

- MTI 1604





Noise Reduction Plan – Muck Haul



- Average TWA for Muck Haul truck operator
 - MTI 1604 w/o cab = 93-95 dBA
 - MTI 1604 w/ cab = 86-89dBA

- Operator exposure is reduced by 10.2 dBA



Noise Reduction Plan – MTI 1604

- Rubber belting 'skirt' to the open engine compartment
- Wrapping the exhaust manifold and tubing with high temp insulation
- Wrapping the turbocharger and discharge elbow
- Wrapping the PTX or DPM soot trap
- Insulating the inside of the engine compartment hoods and covering the rear louvered areas
- Rubber flap over the opening at the transmission tower, next to the operator's right side
- Installing a reverse direction fan
- Insulating the firewall in front of the operator with a custom fit insulating blanket. Several heat resistant sound panels are also placed along the sides of the bulkhead and gaps are sealed.

MTI 1604 Sound Attenuation Checklist

Mechanic Signature _____

Date _____



OK
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OK
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OK
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Tamrock 515 Sound Attenuation Checklist

Mechanic Signature _____

Date _____



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Noise Reduction Plan - Drills & Bolters

- Atlas Copco 282





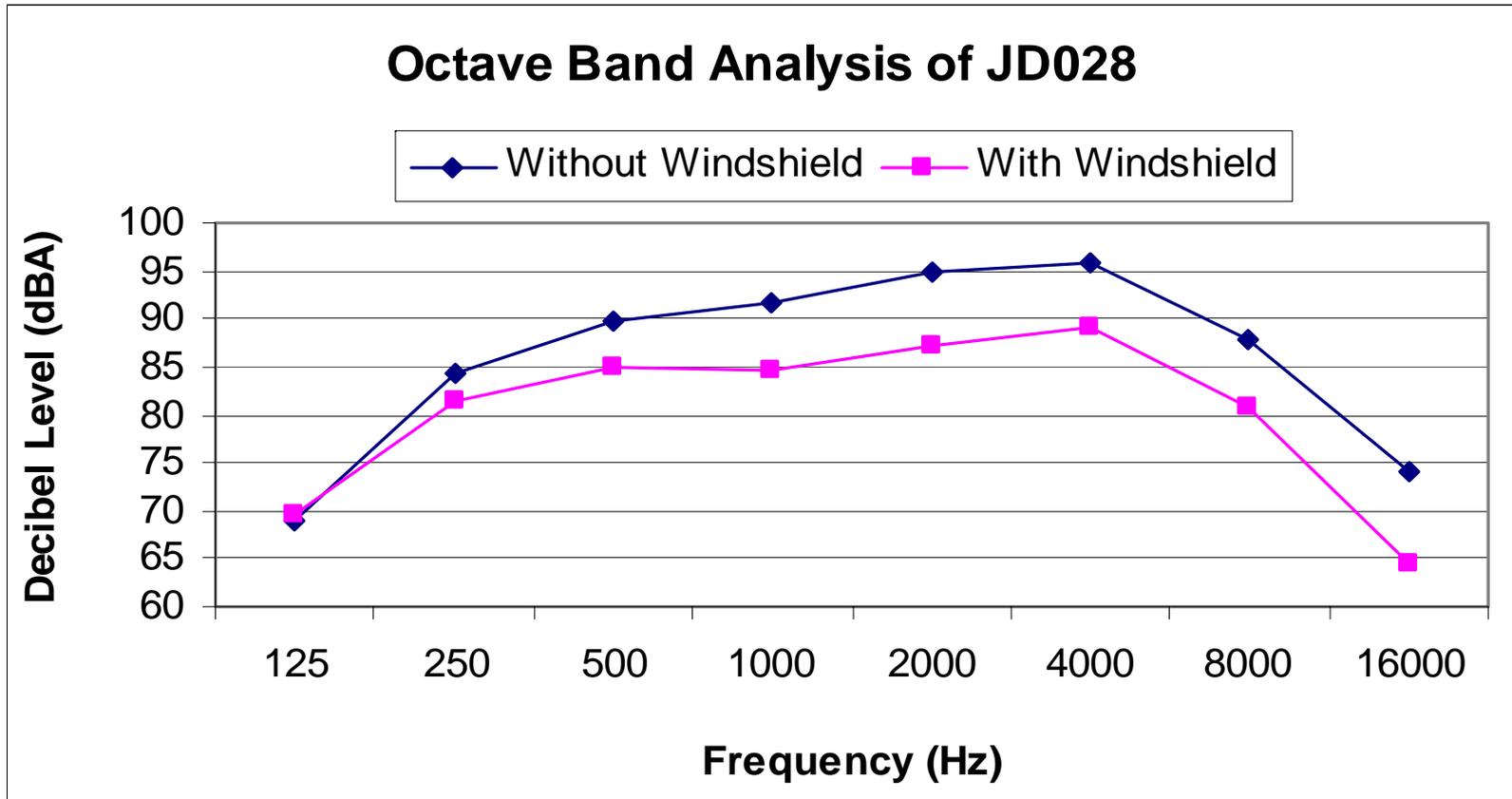
Noise Reduction Plan – Drills & Bolters

- MTI Drift Runner





Noise Reduction Plan – Drills & Bolters



■ Windshield & Canopy = 6.5 dBA Reduction



Noise Reduction Plan – Drills & Bolters

- Atlas Copco H-104





Noise Reduction Plan – Drills & Bolters



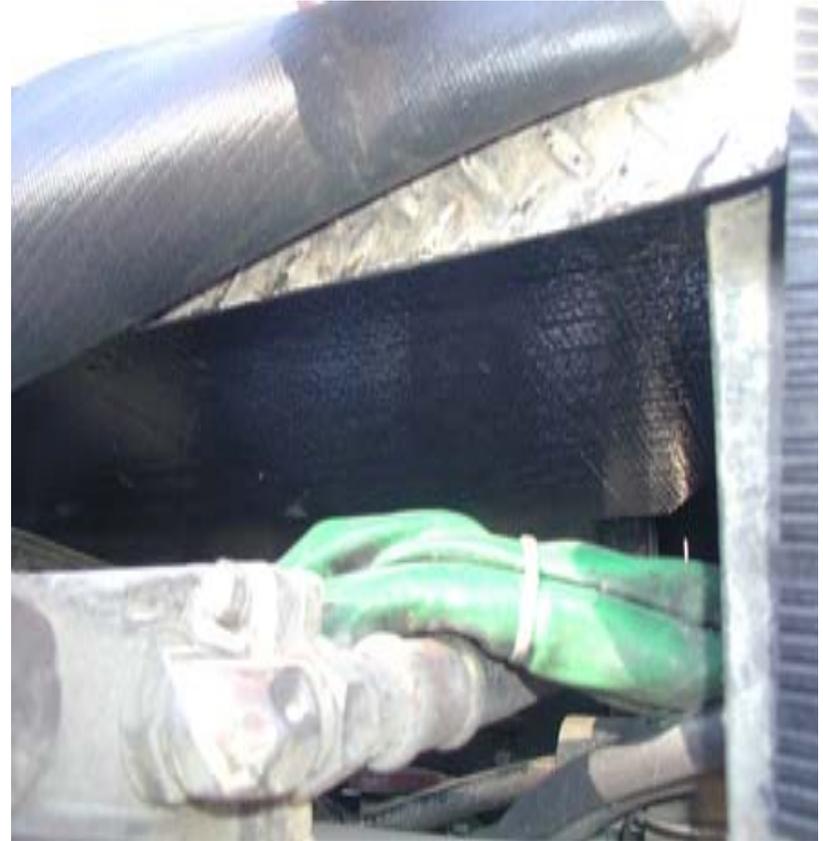


Noise Reduction Plan – Drills & Bolters





Noise Reduction Plan - LHD





Noise Reduction Plan - LHD

- Re-direct the exhaust to the rear
- Wrap or coat exhaust manifold, turbo, and PTX, and tubing
- Plug holes or gaps in the operator's compartment
- Sound curtain in the operator side open engine compartment

LHD Sound Attenuation Checklist

Signature _____

Date _____



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Noise Reduction Plan – Locomotives





Noise Reduction Plan – Locomotives

- Fully enclosed cabs on the four productive locomotives
- Maintain electronic engines, cabs and insulation packages.
- Stillwater developed administrative controls for the Plymouth locomotives that will limit the crew's noise exposure during the occasions these locomotives are used for extended periods.



Noise Reduction Plan – Utility Fleet

- Young buggy





Noise Reduction Plan – Utility Fleet

- Young Buggy





Noise Reduction Plan – Utility Fleet

- Replace mufflers with “Cowl Muffler”, wrap exhaust systems and redirect exhaust away from the operator
- Insulate the inside of the engine compartment hood
- Installed half skirt on the radiator side and a full skirt on the opposite side of the engine compartment
- Insulate the firewall between the operator and engine compartment



Noise Reduction Plan – Utility Fleet

- A-64 Getman





Noise Reduction Plan – Utility Fleet

- A-64 Getman





Noise Reduction Plan – Utility Fleet

- Replace mufflers with “Cowl Muffler”, wrap exhaust systems and redirect exhaust away from the operator
- Installed skirt on the open engine compartment



Administrative Controls

- Monitor and report any noise anomalies in your travel route.
- Maintain a speed that allows for the lowest engine RPM.
- Whenever possible, do not stop or wait under noise generating equipment, i.e. fans, around pumps or pump stations, near operating drills, or in the vicinity of other operating motor driven equipment.
- Report all sources of excessive noise to Modular Mining and your supervisor.
- Document in your notebook or on your 5-point card any items needing correction. These must be reported to your supervisor by the end of shift.



Administrative Controls

- Inspect your equipment frequently for the correct and complete installation of noise attenuation treatments.
- Report any fans that have been disconnected from their ducting or silencers and rips, tears or holes in vent lines.
- Turn off the engines of equipment when waiting for longer periods.
- Maintain a distance between vehicles such that noise from one vehicle does not contaminate your travel area.



Administrative Controls

- Our workforce is being used to evaluate the jobs they perform each shift. While the focus of this effort is to design better work practices and standards with the input of the miner, other improvements may evolve from the process.
- As a part of this process we will be asking our miners to look for ways to reduce exposure to hazards as they see them. Feasible items will systematically be implemented upon completion of an evaluation by our work teams.
- Continued and ongoing area and spot dosimetry is being conducted to identify other possible opportunities for change in the work practices that may reduce noise exposure.



Thank You

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