



## *“30-Years of Mining - Lessons Learned”*

*Joe Driscoll*

*Principal Mining Engineer  
Denver Manager  
Amec Foster Wheeler*

# Today's Discussion

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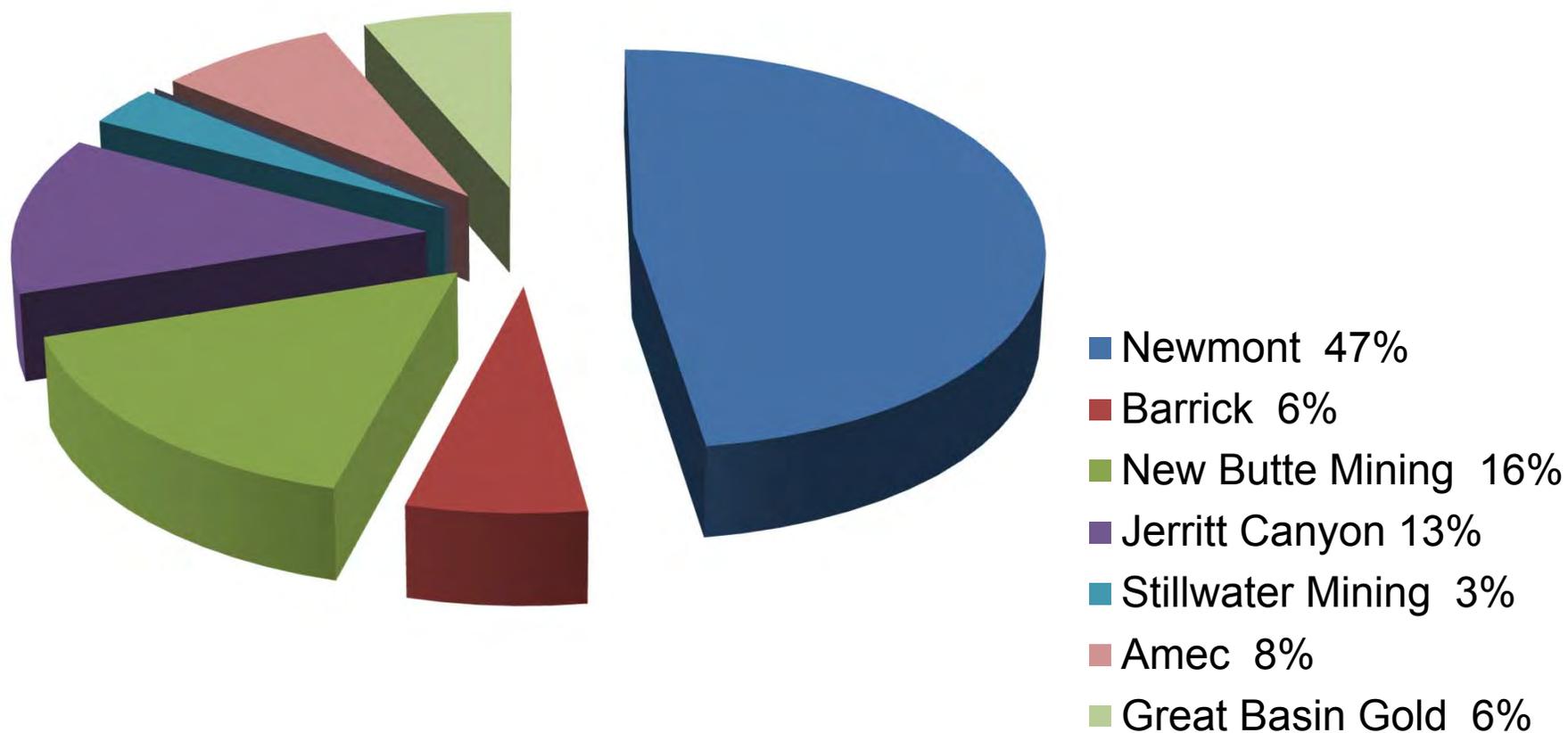
1. Safety Lessons Learned
  2. Technology Lessons Learned
  3. People Lessons Learned
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The safest thing to come out of any mine is the Miner!



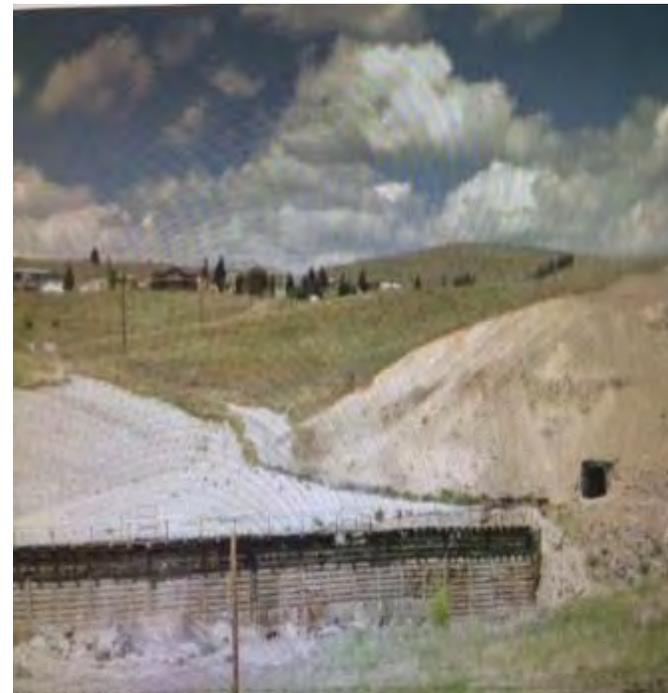
## 30 Years of Mining

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# Lexington Mine – First Job Out of Tech

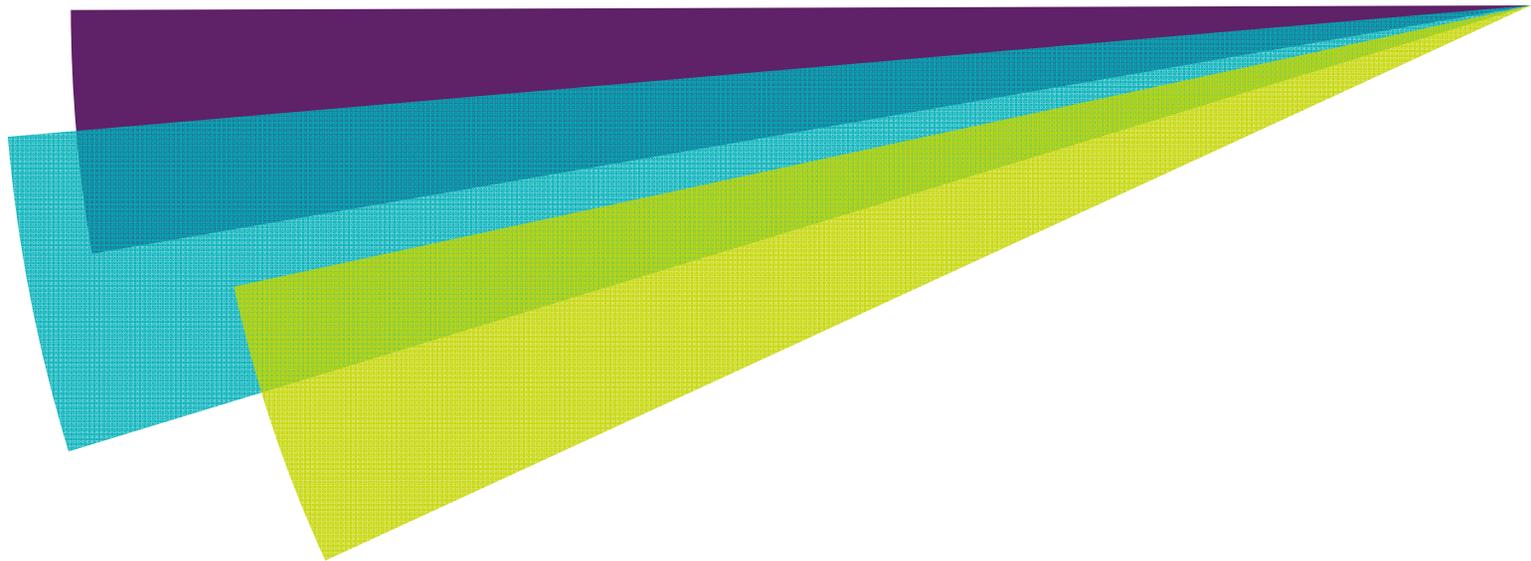
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First Engineering Job – Help put in Dump Wall

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# Safety Lessons Learned



# Don't Leave Survey Instrument Next to the Tracks!

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## Some Bad Lessons Learned on My First Job out of Tech

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- ▶ Short Fuses – Hurry down the raises – It did not fire
  - ▶ Ride in ore cars except the last car – Mickey slid out of car
  - ▶ Re-rail an overshot mucker with a 2 foot starter steel
  - ▶ Open Stope – broken slusher cable – what now?
  - ▶ Timber raises off of lagging 200' to the bottom
  - ▶ Subsidence at Blaine School – Dale – Quit slushing – call Pioneer for sand – big hole on play ground
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# Just last Month – Ask My Buddy Tom Malloy

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# What did safety really look like in the late 80's in Butte where I worked?

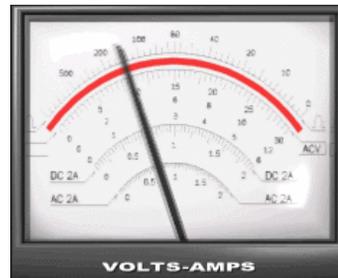


Participation ?

Consent ?

Ownership ?

Awareness ?



Integration ?



# Next Job – Jerritt Canyon Elko, NV



# Safety Lesson Learned





We went 1,000,000 manhours w/o  
a LTA at Jerritt Canyon

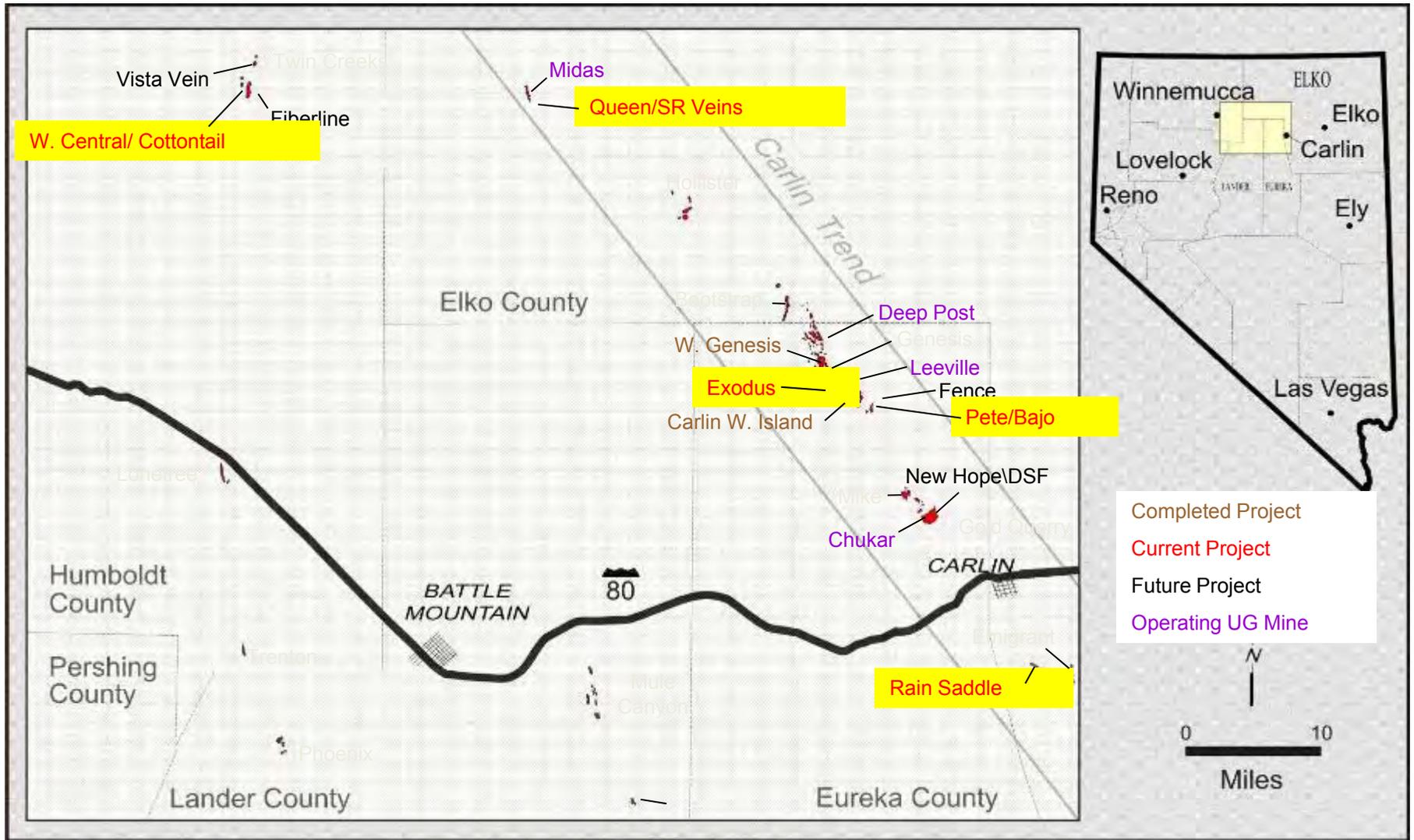
First Time I was introduced to this LTA term

# Awesome Mine Bright Future!

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# Working Along the Carlin Trend



# Newmont Nevada Underground Operations

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*Deep Star*



*Leeville*



*Pete Bajo*



*Exodus*



*Midas*



*Chukar*

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# Why go home safe? Story of the Tom Scott Tragedy

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# Metal/Nonmetal Mine Fatality

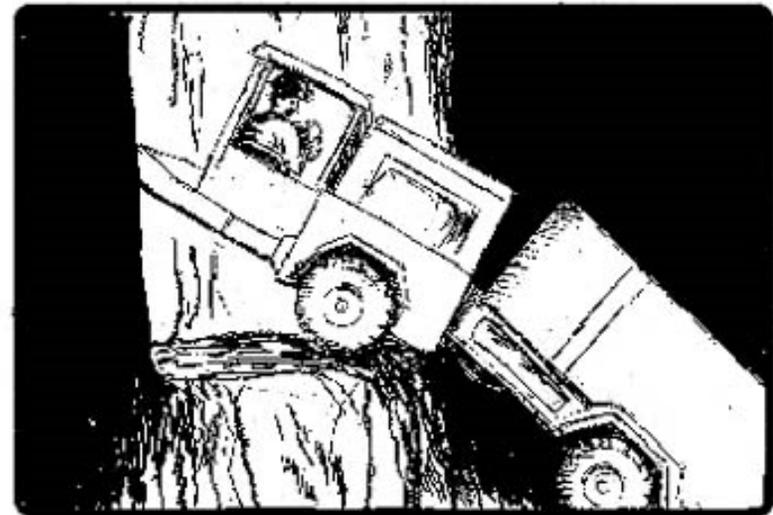
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On January 9, 2001, a 30-year-old miner with 7 years mining experience was fatally injured at an underground gold mine.

The victim was wetting down the underground haulage way when he backed his water truck over a berm, falling approximately 60 feet into the stope.

## Best Practices

- ▶ Dump sites should be provided with restraints or devices that prevent over-travel.
- ▶ Signs or warning devices should be installed near underground dump locations to alert operators of mobile equipment.



# NEVER AGAIN!

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# How strong is your promise?

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## Mission Statement

"To further academic and athletic opportunities for the youth of Elko County."

Besides the Junior Golf program, the committee has donated to the Igloo organization, the Spring Creek High School Golf Team, the Gamble Oak Pony Club, the Cinderella Scholarship Pageant, Sage Elementary School, Spring Creek Trap and Skeet, and Adopt a Family among others.

The Thomas Scott Memorial Golf Tournament is dedicated to and held in memory of Mr. Thomas Scott. An Elkoan for many years and underground miner for Newmont Mining Corporation, Thomas J. Scott was just 30 years old when he was suddenly taken from his family and friends in a tragic accident on January 9, 2001. Tom is survived by his wife, 13 year old son and many friends who miss him. The tournament is the committee's way of memorializing Thomas for his love of family, friends and life. Tom was not only a loving family man but an active member of the community.

Anyone wishing to donate a hole sponsorship, auction item, raffle prize or other services should contact the Thomas Scott Foundation, the governing organization for the memorial. For more information please contact Chairman Jayson Stanton at 738-5962, Vice-Chairman Karl Young at 753-9340, Public Relations Director Frank L. Sawyer at 753-5474, the Spring Creek Golf Course at 753-6331 or on the web at: [www.tomscottmemorial.org](http://www.tomscottmemorial.org). The Thomas Scott Memorial is a proud member of the Elko Area Chamber of Commerce.

The Thomas Scott Memorial...a time to remember!



PGA Golf Professional Jason Jerman and members of the Spring Creek Tom Scott Junior Golf Program accept a donation check from the Thomas Scott Foundation.



# Midas, Jerritt, and Barrick Now Use Stope Blocks

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# Barrick Meikle and Rodeo

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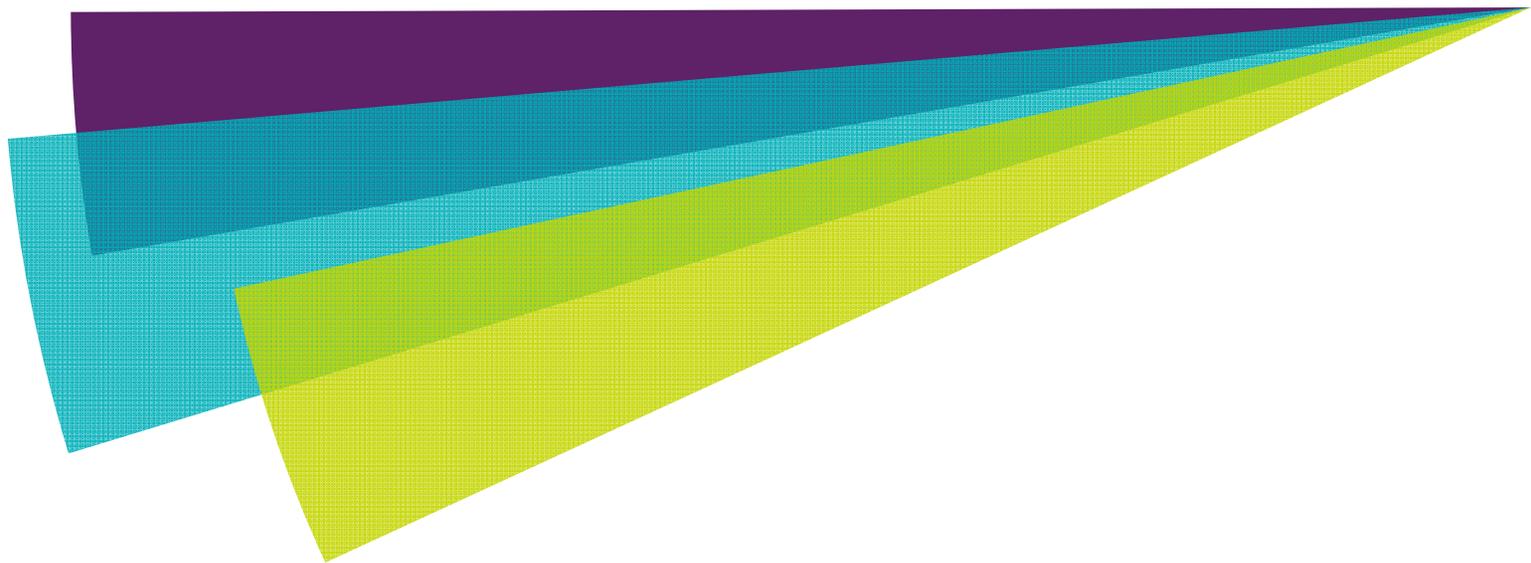
# Hollister

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# Best Safety Tools that I Will Always Use that I have Learned in My 30 Years of Mining at all the Mines



# Workplace Organization – Good Housekeeping

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## 5S Explanation



# Workplace Examples

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# Workplace Examples

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# Workplace Examples

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# Set In Order Examples

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# Brilliant Portals

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# Awesome Underground Shops

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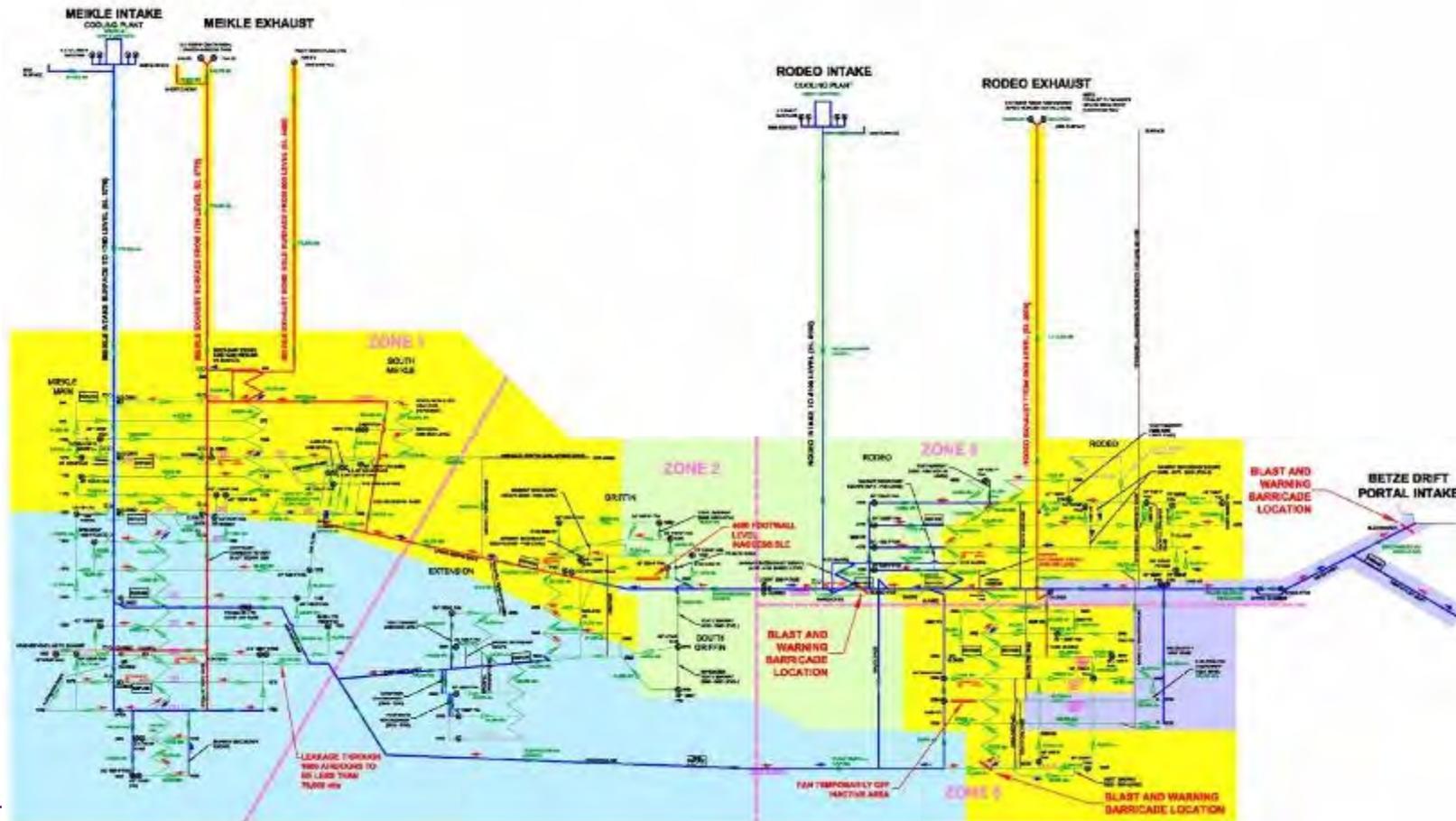


# Amazing Refuge Chambers

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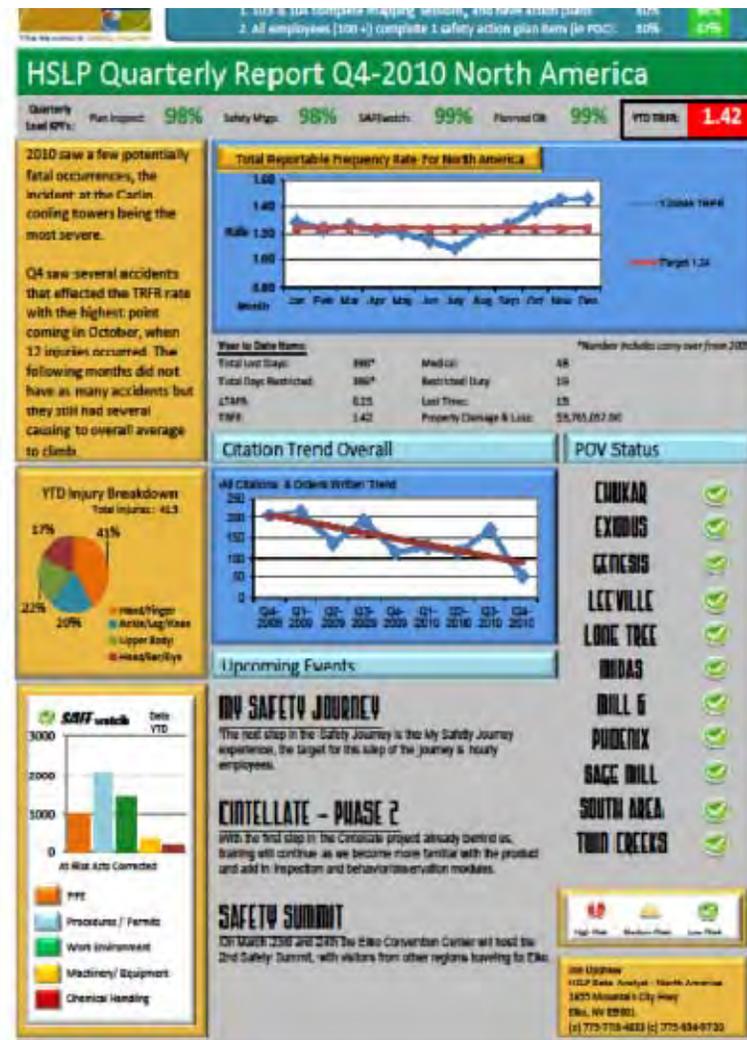
# Zone Mining – Made it Easier to Understand and Manage the Mine



# Great Company Dashboards

Dashboard to Include:

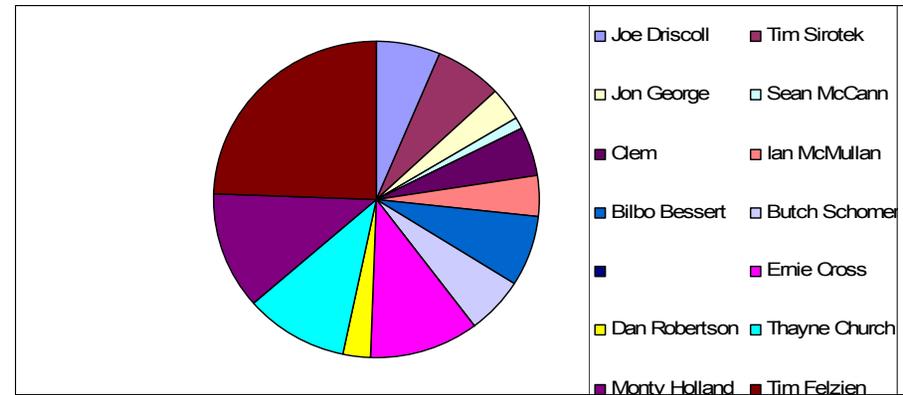
- ▶ MRA's
- ▶ LTA's
- ▶ S&S Citations and Orders
- ▶ POV Score card from Predictive Tool
- ▶ 5-Point Card Score and Compliance
- ▶ Equipment Inspections and Compliance
- ▶ General Inspection Compliance
- ▶ Task Observations
- ▶ House Keeping Initiatives like 5-S
- ▶ Safety Commitments and Initiatives
- ▶ Other





# Visible Felt Leadership

- ▶ More presence in the field doing task observations and 5-Point interactions
- ▶ Track it and post it!



## Leeville Underground Division Visible Leadership Tracker - January 2008

Underground Tours	Yellow
Attend PAT Huddles	Cyan
Attend Weekly Safety Meeting	Purple

Name	T 1	W 2	Th 3	F 4	S 5	S 6	M 7	T 8	W 9	Th 10	F 11	S 12	S 13	M 14	T 15	W 16	Th 17	F 18	S 19	S 20	M 21	T 22	W 23	Th 24	F 25	S 26	S 27	M 28	T 29	W 30	Th 31	
Joe Driscoll	Yellow		Cyan	Purple		Yellow		Yellow		Cyan	Yellow				Yellow	Cyan	Yellow	Purple				Cyan	Yellow	Yellow		Purple			Yellow	Yellow	Cyan	
Tim Sirotek		Cyan		Yellow			Cyan				Yellow				Cyan		Yellow		Purple				Cyan	Yellow					Yellow	Yellow	Yellow	
Jon George			Cyan	Yellow						Yellow	Purple					Yellow		Cyan					Yellow		Yellow	Purple			Cyan	Yellow	Yellow	
Sean McCann				Purple				Yellow							Yellow								Yellow							Yellow	Yellow	
Clem Hartery				Yellow						Yellow	Purple				Yellow				Purple							Yellow				Yellow	Yellow	
Ian McMullan	Yellow			Purple			Cyan	Yellow			Purple				Yellow				Purple			Cyan	Yellow			Purple			Cyan	Yellow		

# Maintenance C.L.A.I.R Bay's

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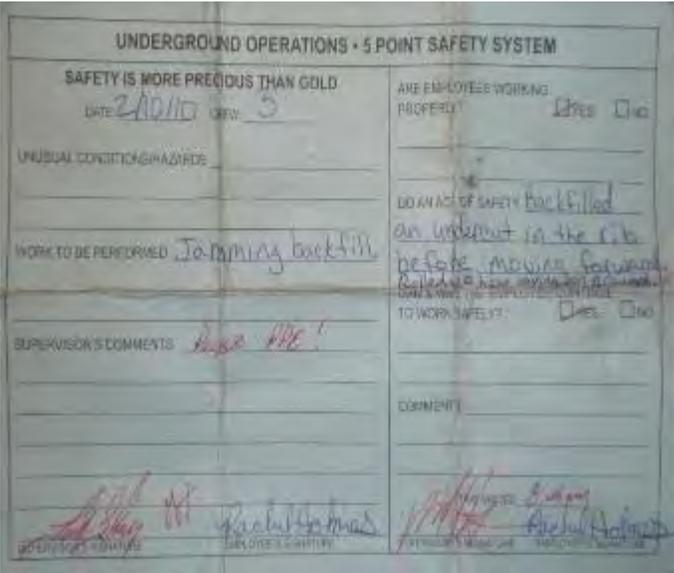
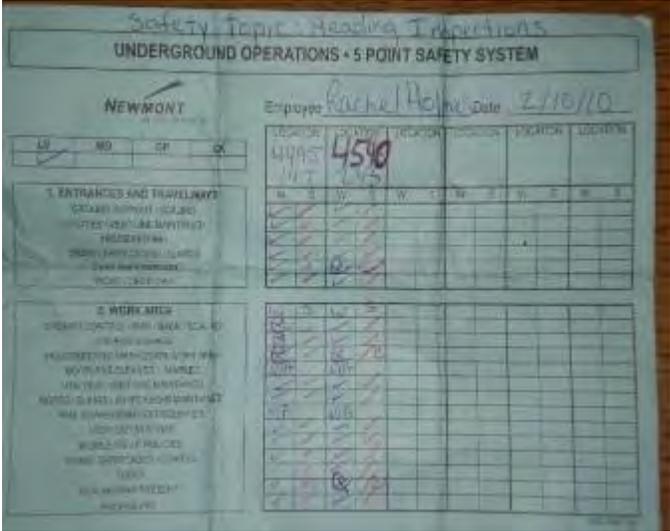
C.L.A.I.R Bays Underground to do proactive day to day maintenance

- ▶ Clean
- ▶ Lubricate
- ▶ Adjust
- ▶ Inspect
- ▶ Repair

**Improves Mean Time  
Between Failures**

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# 5-Point Workplace Card, Tracking, and Follow-up



## What Gets Measured Gets Done!

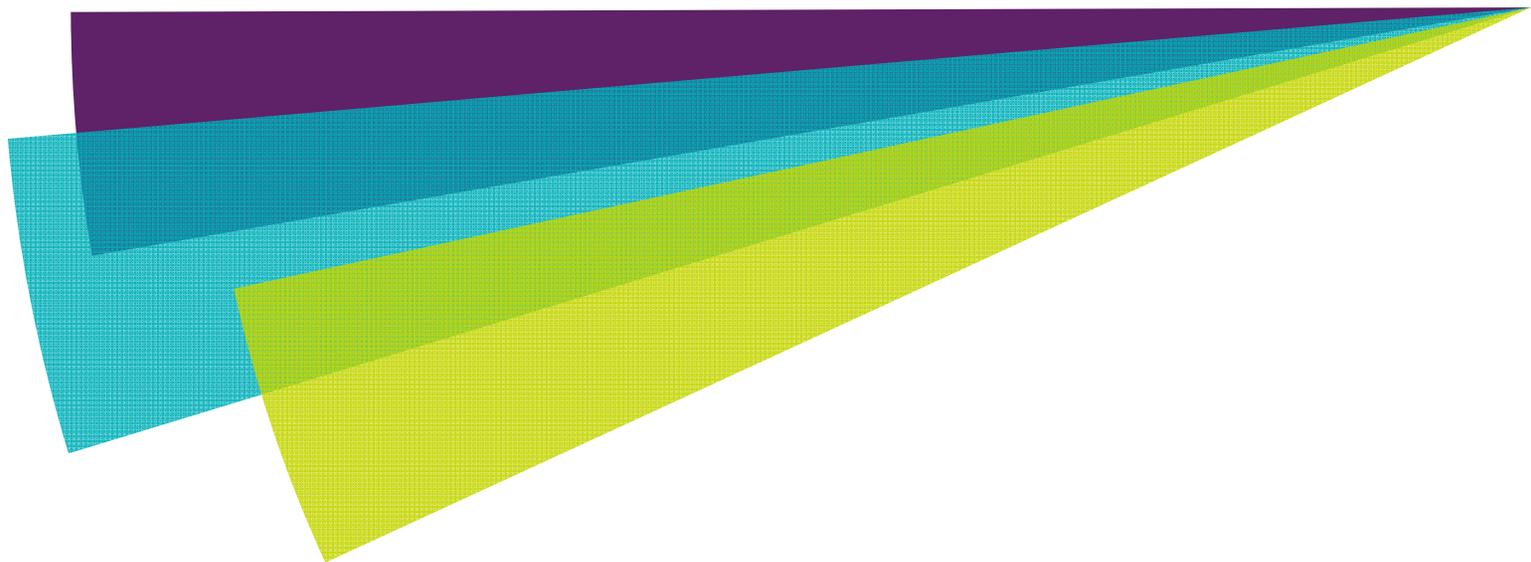
Total Mine Crews	
Count	6127
Completed Card - Employee	100%
Completed Card - Supervisor	72%
Incomplete Workplace Inspection - Employee	3%
Incomplete Workplace Inspection - Supervisor	28%
Incomplete Signed Card - Employee	1%
Act of Safety	96%
Supervisor Comments	63%
Hazard Identification	8%
Hazard Mitigation (rehab, housekeeping, etc.)	6%
<b>Awesome Card</b>	<b>3%</b>



## Courageous Leadership to the Safety Journey

What is Your Personal Commitment to Safety?

“Steal with Pride”

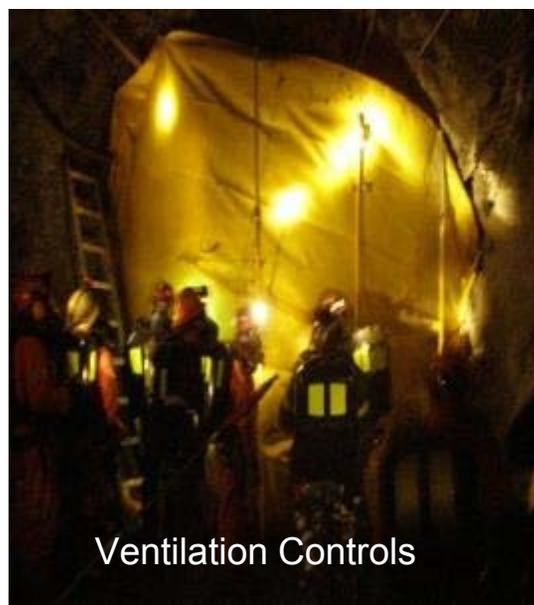
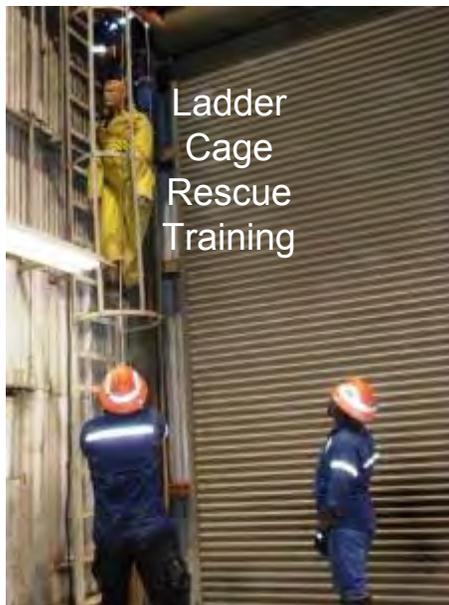


# Newmont Carlin & Midas Underground Mine Rescue

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# Newmont Carlin & Midas Underground Mine Rescue



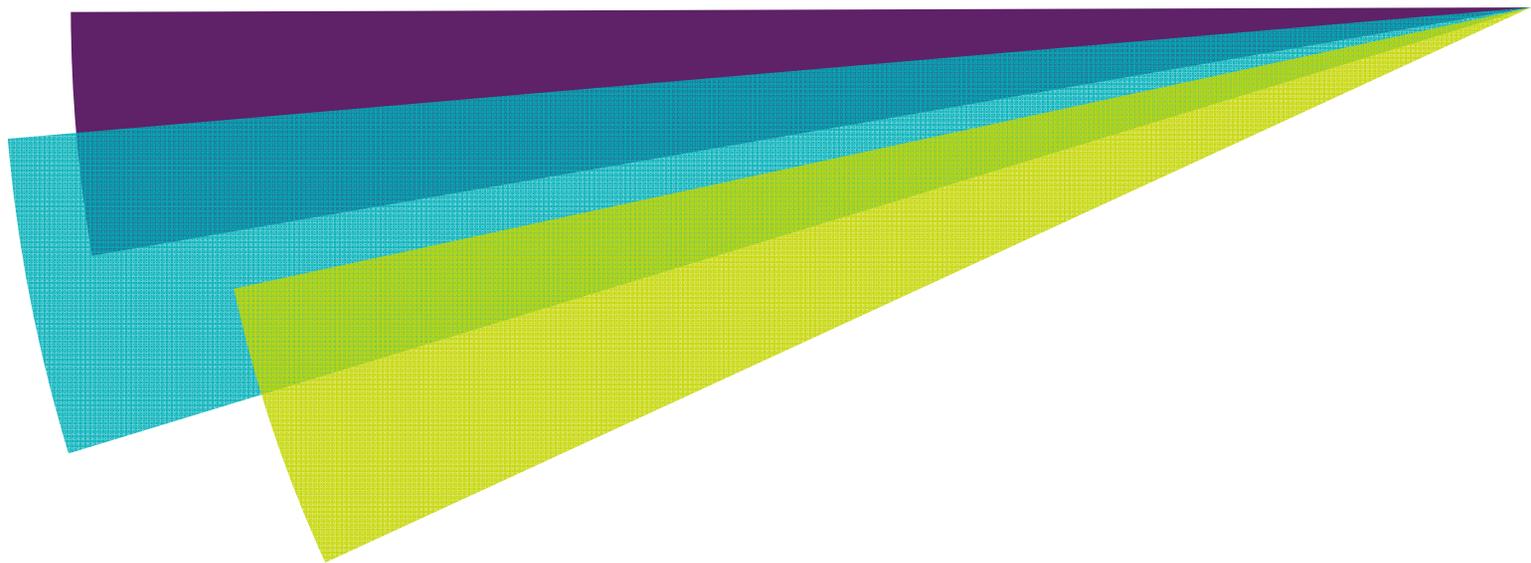
# Annual EMS Event at Barrick Goldstrike

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## Technologies Learned and Implemented



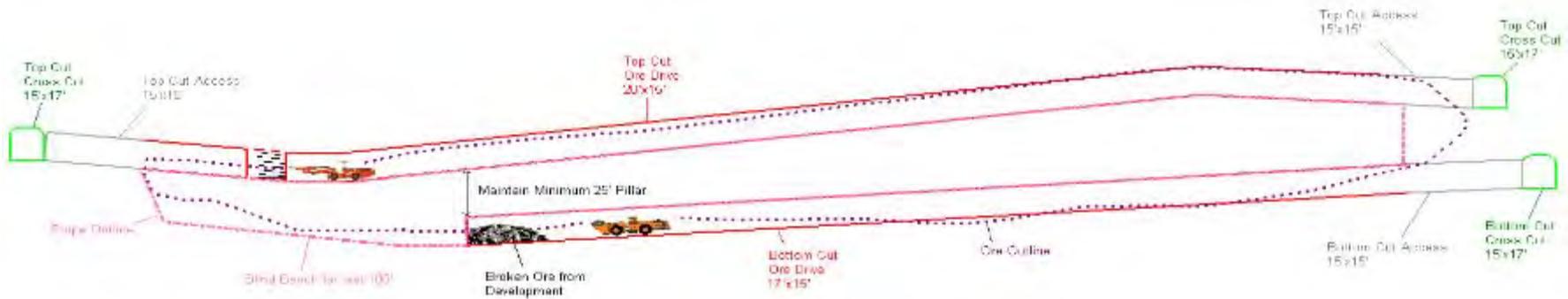
## Best Mining Method - Avoca

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Avoca – It came from the Irish copper mines dating back to the mid 1800's



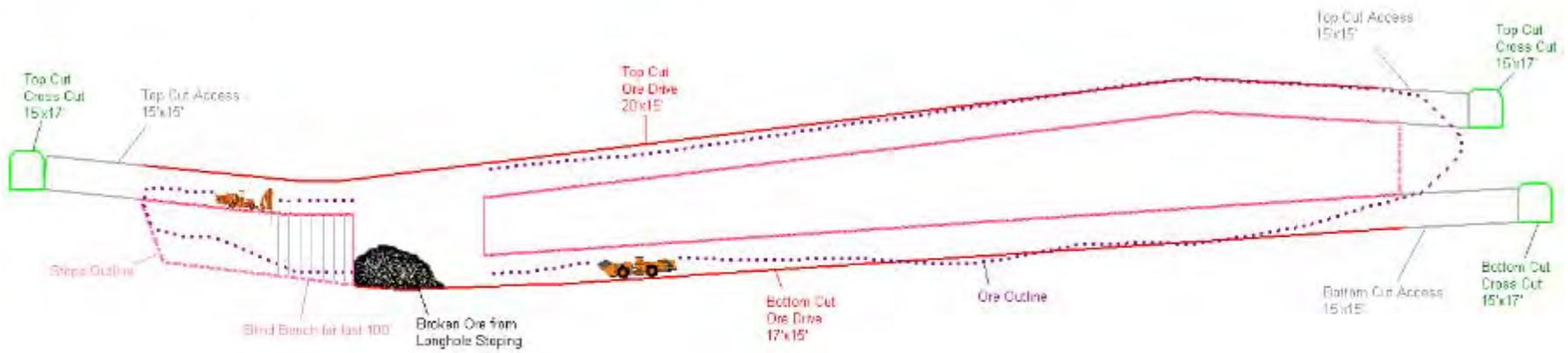
# Avoca Stopping Method



Need access from both sides on top

# Avoca Stopping Method

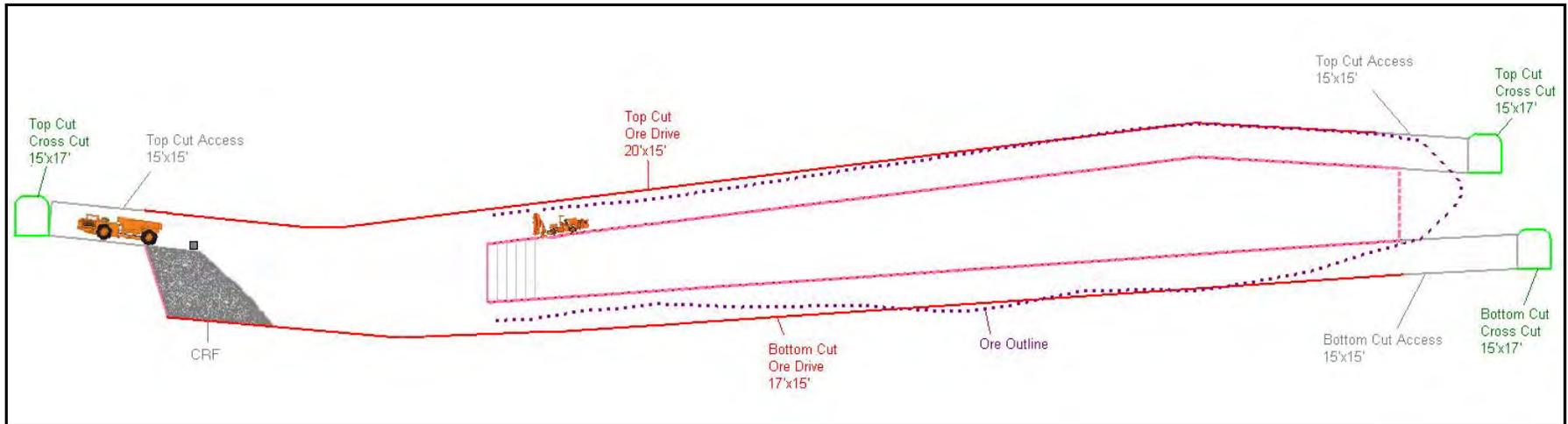
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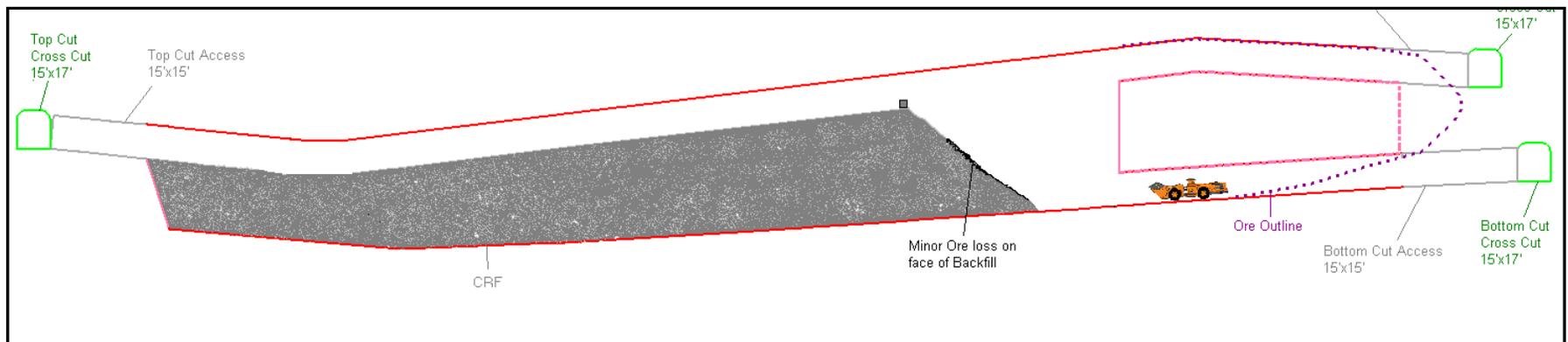
Start stopping on the left side

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# Avoca Stopping Method

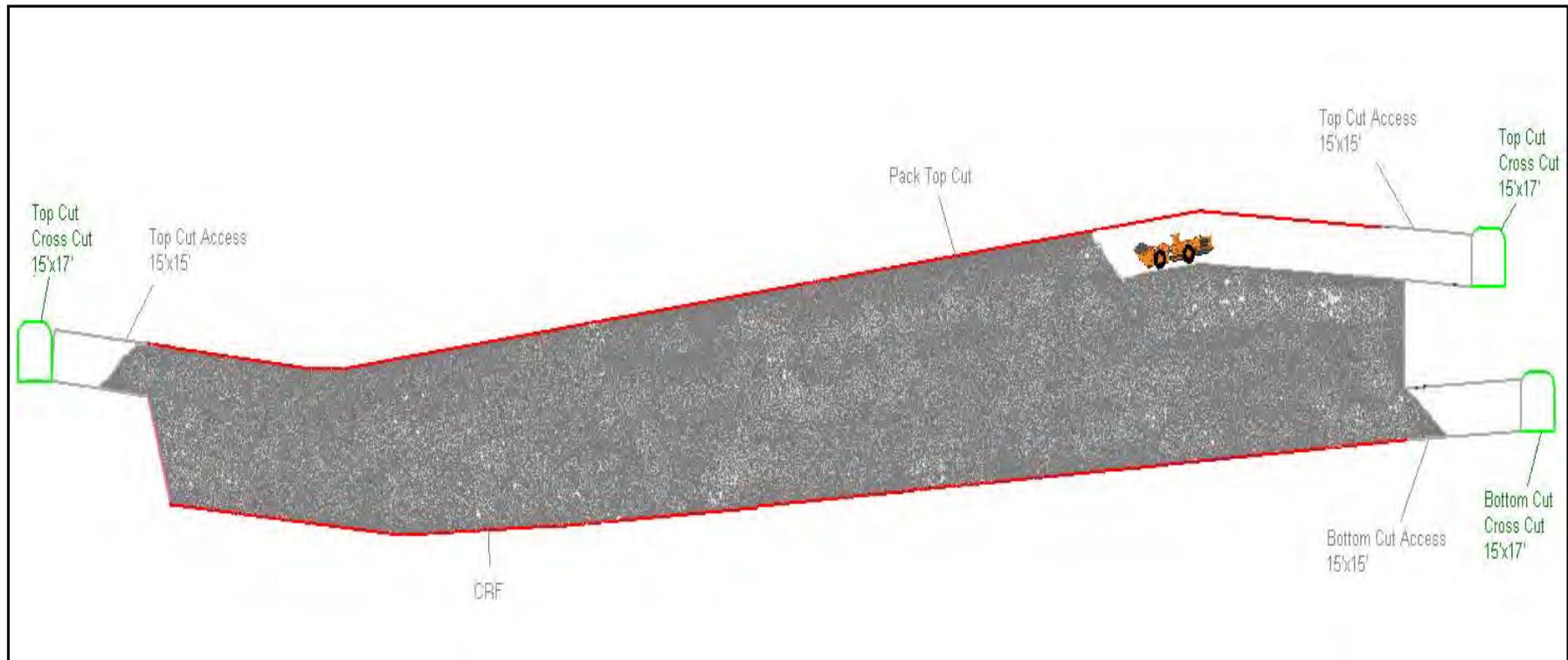


Begin backfilling and retreat mining at the same time



# Avoca Stopping Method

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Finish backfilling and jam the top drift shut

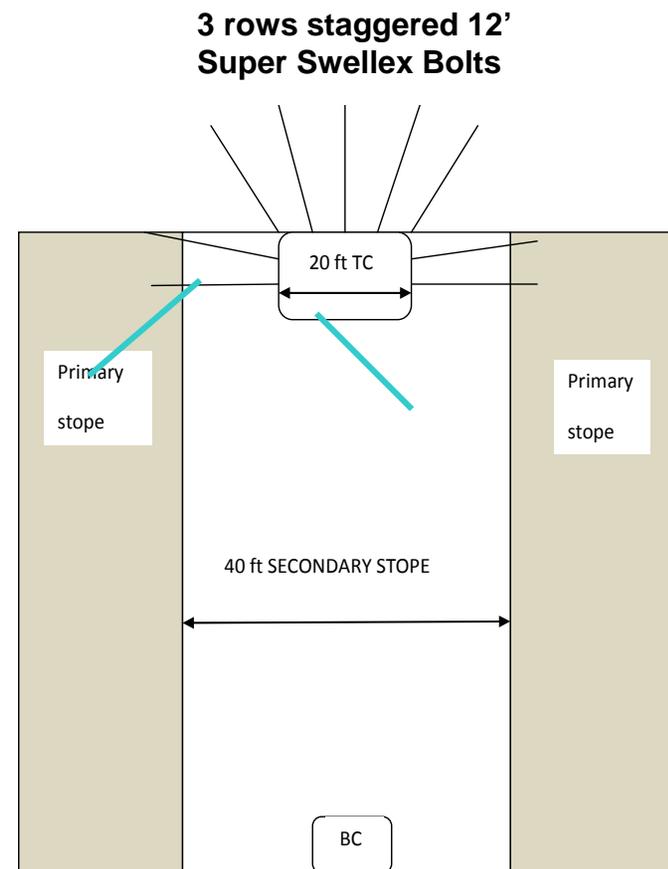
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## Take it a Step Further Wide Stopping at Leeville

- ▶ Move to a Primary/Secondary sequence with 20 foot primary and 40 foot wide secondaries
- ▶ Maintain top cut width at 20 feet
- ▶ Maintain minimum BC to protect rock pillars

### Benefits

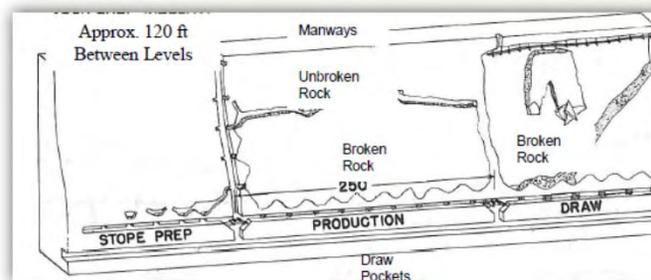
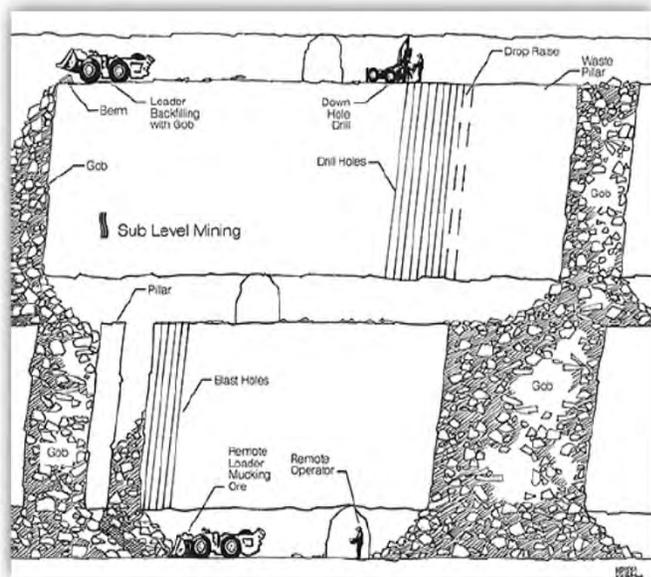
- ✓ Additional Gob Capacity
- ✓ Reduce Development
- ✓ Less Slots



DRAFT



# Stopeing at Hollister – We used foam for backfill and mined 600k ounces doing it!



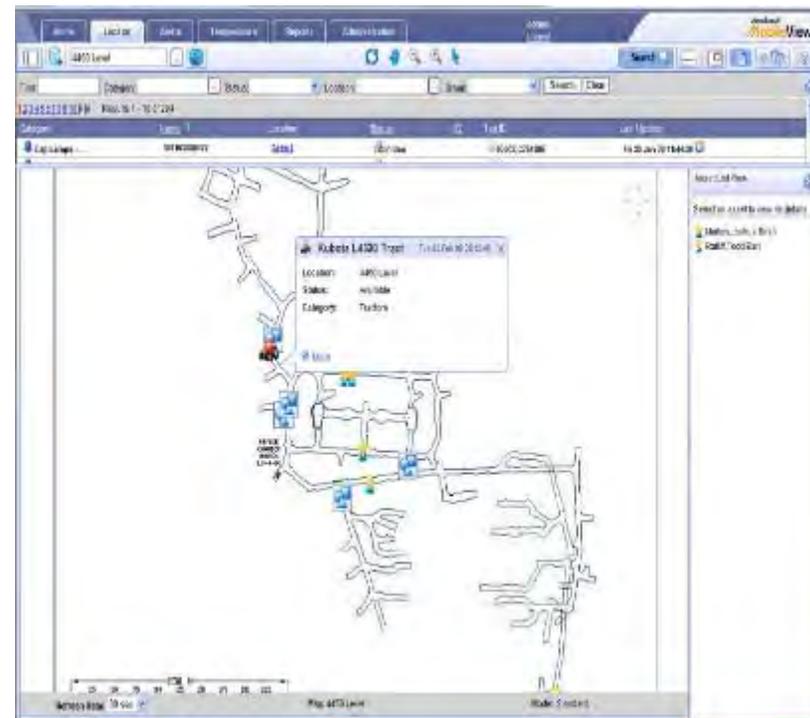
# U/G Wireless Location System

## Safety - Tracking

- ▶ MST ImPact wireless network
- ▶ AeroScout real time location system
- ▶ ICCL Cap Lamp (with built in tag)
- ▶ AeroScout & Mine Suite software
- ▶ Video monitoring in refuge chambers

## Efficiency Improvements

- ▶ Visualization of production cycle
- ▶ Accurate Data



# Swellex Bolts – Substantially Reduced Roof Failures in Nevada!



# Remote Mucking Swings to Deflectors to Fully Autonomous Mucking

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# Use of Remote Mucking Deflector Plates or Stands when remote mucking

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## Old Hoists Still Used in Nevada – Just Updated Electrics

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**12' diameter Allis-Chalmers Service Hoist –  
2500 Hp Mfg. 1937**



**8' diameter Nordberg Hoist at Vent Shaft–  
1400 Hp Mfg. 1954**



**O&K Auxiliary (Chippy) Hoist  
– 300 Hp Mfg. Date: 1978**



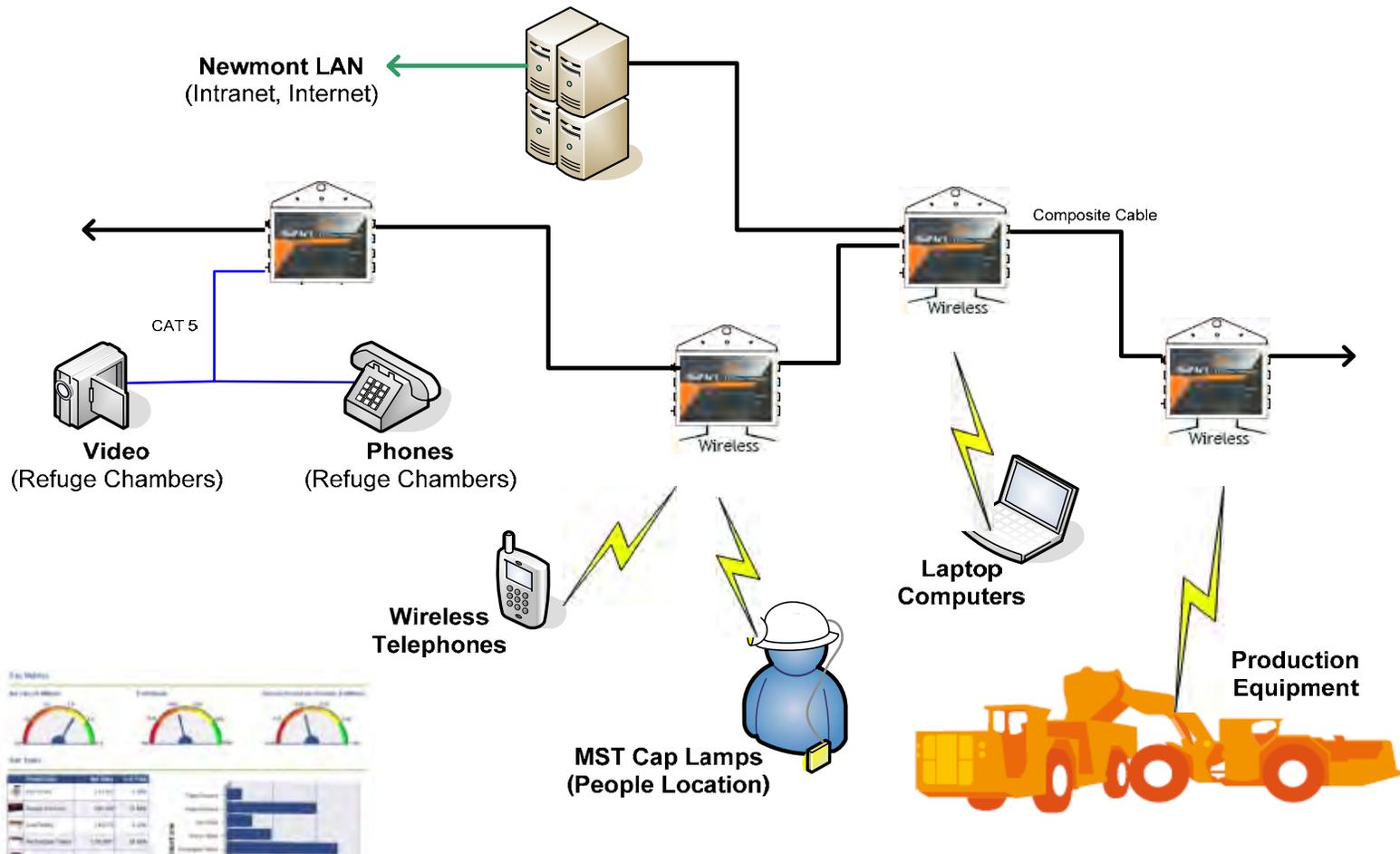
**Production Hoist: Canadian Ingersoll Rand  
– 1400 Hp Mfg. Date: 1966**

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# Dispatch is a Must! Pitram, Modular, Mine Star

amec  
foster  
wheeler



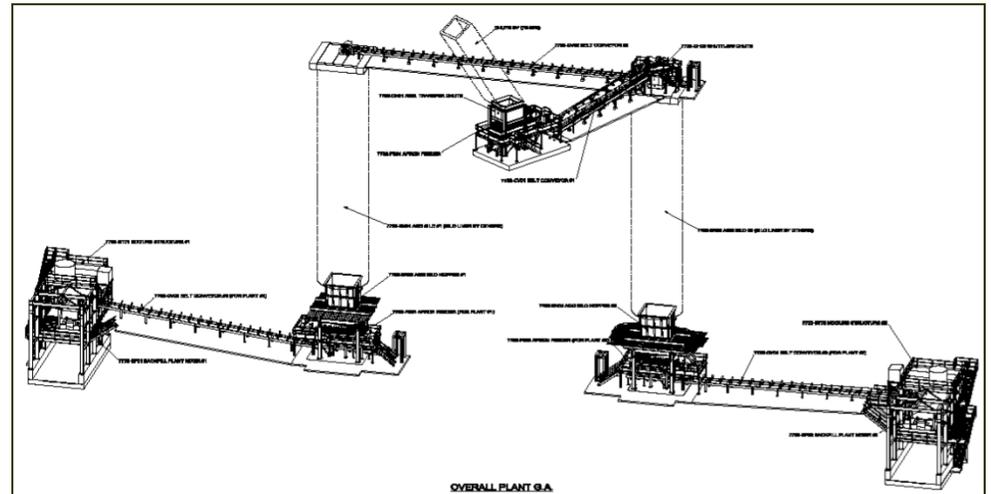
# Metal Removal Plant to Get Rid of Tramp Steel

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# Backfill Aggregate Delivery System – No Plugged Holes

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# Newmont #3 Frozen Shaft – First One in the States



# Nyrstar Tennessee Mines – Road Trains

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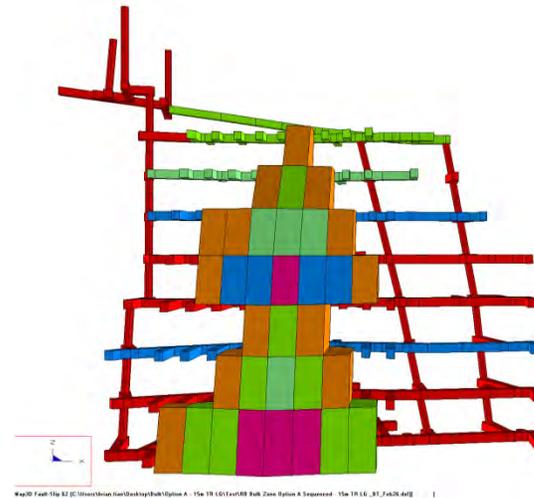


# Compass Minerals – Mechanized Mining

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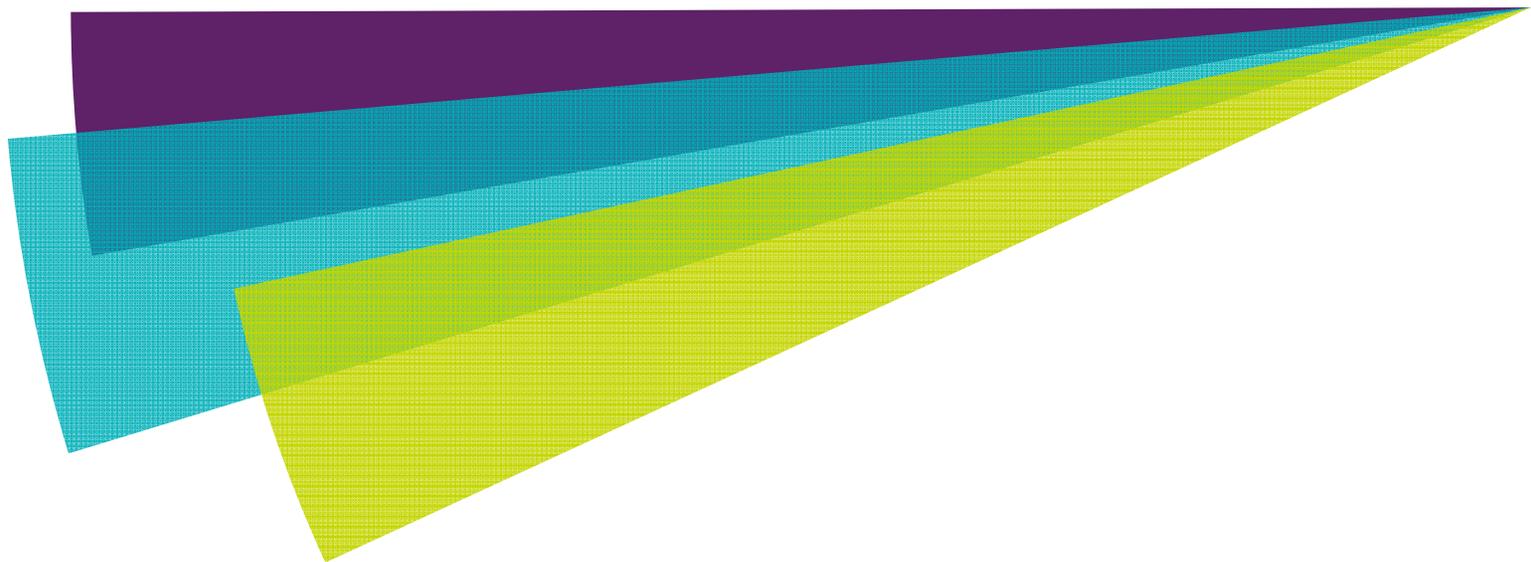


# St. Johns, Newfoundland – Vale – FEL 3





# People and General Lessons Learned Past 30 Years



# Never Compromise Safety

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# Seek Knowledge

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Look for the oldest guy and  
pick his brain

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# Lack of Experience

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There is no crime in saying,  
“I don’t know how.”

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# Take Responsibility

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When you blame others you  
give up control

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# Work Harder and Smarter

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Have a balanced work life!

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# Dilution

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Ounces pay and tons cost!

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# Humor

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Are you having fun?  
You better be!

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# Lead by Example

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Do you text and drive?

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# Listen Carefully

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Never assume to know the  
answers and ask lots of  
questions and seek the  
answer

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# Engage the Workforce

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They want to be valued and generally willing to share a lot of good information

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# Have an Open Mind

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Be open to trying almost anything – there is more than one side to a story

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# Keep Your Word

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Do what you say you  
are going to do!

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# Project Details

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The devil is in the details

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# Long Term Thinking

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Its hard to come up with a  
long range plan when you  
are getting blown out of the  
sky

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# Learn to Negotiate

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In business you don't get  
what you deserve, you get  
what you negotiate

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# Pay Checks

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Don't mess with the hands  
pay – not even one dime!

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# Visible Leadership

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Show them how much you care and not how much you know. If you are not around they will call you Casper

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## People's Names

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- ▶ You had better know everyone of your miners names even if there are 1,000 of them. No one wants to be called Pard.
  
- ▶ Set up a “I know You Tracker”



# Network-Network-Network

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Yep – I even do it on the  
light-rail in Denver

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# Never Ever Burn a Bridge

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Honestly – You most probably will have to go back  
and work for that dude again – Mining is smaller  
than Doritos

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# Questions?



Thank you for this opportunity!