

Protecting a Gold Mine from Wildfire

“Lessons Learned”

Wildland Fire Canada 2010

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Presentation Overview

- ◆ Provincial Fire Situation
- ◆ Team Responsibility
- ◆ Mine Situation
- ◆ Team Response
- ◆ Environmental Protection Assessment
- ◆ Concluding Remarks

Fire Situation Overview

- ◆ 9 fire complexes Provincially
- ◆ Nationally everyone else busy
- ◆ Muskose complex – 5th in provincial priority
- ◆ Limited resources
 - Helicopters
 - Burn teams
 - Air tankers
 - Personnel



Team Responsibility

- ◆ Four fires by Deschambault Lake
 - Active suppression
- ◆ Protection of Mine Site







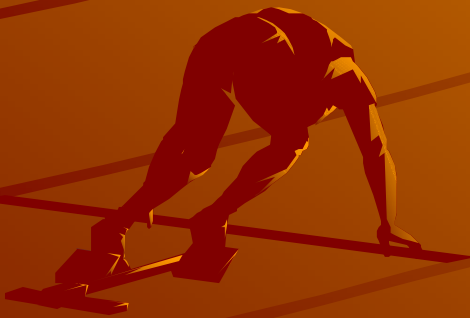


Mine Situation Overview

- ◆ Partial evacuation in place – 4 fires threatening mine site
- ◆ Losing \$149,000 per day
 - Transportation
 - Food and lodging
 - Wages
 - Lost production
- ◆ Pressure to change policy

Economic Value

- ✦ Infrastructure \$200 million
(relatively small)



Team Response

✦ Assessment of situation

- Met with mine management
- Flew fires/values with them
- Listened to concerns
- Continued good communications

✦ Assigned Expert Assistance

- Wildland Urban Interface Specialist
- Experienced Suppression Manager

Position Responsibilities

✦ WUI Specialist

- Alert us to the hazardous goods & issues
- Reviewed and organized evacuation plan
- Sprinkler system management

✦ Suppression Advisor

- Fuels management
- Suppression plan
- Supervise 20 type III staff

EP Assessment

- ◆ 5 Km evacuation zone
- ◆ 10 Km exclusion zone
- ◆ Up to 5 Km nothing living
- ◆ Years of clean up required



Air Dispersion Model

- ✦ Based on chemicals present
- ✦ Four models run
- ✦ Three threat zones
 - Life threatening
 - Severe health risks
 - Mild discomfort



EP Assessment Concerns

- ✦ SCBA's only good for 60 minutes
 - **No fly zone: 5 km radius, 3000'**
 - Have to walk into site to assess
 - Require 1/3 reservoir
 - Logistically impossible to manage
- ✦ Evacuate underground (Emergency Plan)
 - 3 days supplies
 - Recommended a full week

Dangerous Goods on Site

- ◆ 400,000 Kg sodium cyanide
 - ◆ 20,000 Kg hydrochloric acid
 - ◆ 2.5 million liters of diesel
 - ◆ Handout for complete list
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- ◆ **Gold mines have especially bad chemicals**
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- ◆ **Potential to be a “World Class” Catastrophe**













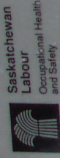












MINE SAFETY UNIT

THIS MAGAZINE OPERATED BY CLAUDE RESOURCES INC.
FOR THE STORAGE OF 150,000 DETONATORS
SIGNED _____ CHIEF MINES INSPECTOR

THIS PERMIT SHALL BE POSTED AND MAINTAINED IN THE MAGAZINE

The following requirements will be complied with:

A person shall not,
a) commit a careless act with an explosive or where explosives are stored;
or
b) omit or neglect to report immediately to the employer at the mine, the discovery of any such act having been committed.

The employer shall,

- make a prompt investigation when an act is discovered by or reported to that employer;
- report each such act to an inspector within twenty-four hours.

Every magazine shall be under the direction of the employer or a person appointed by the employer.

Every magazine shall be securely locked at all times when the attendant is not present and it shall be clearly indicated by some visible sign that explosives, blasting agents or detonators are stored therein.

Every possible precaution shall be taken in the handling and transportation of explosives, blasting agents and detonators. Care shall always be exercised to avoid physical shock. Rough handling shall not be permitted. Cases containing explosives shall always be lifted and set down carefully and never dropped.

A worker shall not smoke while handling, transporting or using explosives, blasting agents or detonators or within twenty-five feet of any magazine or other place in which they are stored or handled.

An explosive shall not be used at a mine unless there is plainly printed or marked on every original package containing such explosive,

- the name and place of business of the manufacturer;
- the strength of the explosive;
- the date of its manufacture.

An article of iron or steel, other than a fixture, shall not be kept or used in any magazine.

An open flame shall not be taken within twenty-five feet of any magazine in which explosives, blasting agents or detonators are stored.

No detonator or capped fuse shall be,

- kept or stored with other explosives; or
- taken into a magazine or other place where other explosives are kept.

Detonating fuse shall be stored in the explosives magazine and not in the same storage place as any detonator or capped fuse.

Every magazine at a mine shall be kept meticulously clean, dry and free from grit and other extraneous material at all times.

Broken cartridges of explosive, spilled blasting agent or deteriorated blasting caps shall not be allowed to accumulate in a magazine but shall be cleaned up and suitably disposed with.

The shelves and floors of every magazine shall be treated, when necessary, with caustic lye or other suitable neutralizing agent to remove any traces of explosive substances.

For every magazine for which a licence has been issued there shall be maintained an accurate record of,
a) the total quantity of explosive, blasting agent and the number of detonators;

- the date, quantity, type of any delivery of explosive, blasting agent or detonators to that magazine;
- the date, quantity, type and name of person to whom any explosive, blasting agent or detonator was issued;
- the signature of the persons responsible for accepting or issuing such explosive, blasting agent or detonators;
- the record shall be countersigned by the person required to make the inspection.



SITUATED AT SEABEE MINE PROJECT
IS HEREBY APPROVED
PERMIT NUMBER S-CR-S-S-D-19
DATE JANUARY 31, 1995

the time the explosives leave such surface storage place and the time they are properly stored in designated storage places in the mine or distributed to points of use in the mine.
Any such transfer of explosives or blasting agent shall be conducted or supervised by a person authorized for that purpose.
Explosives or blasting agents shall not be left at any level station or near the shaft collar or other entrances to the mine.
Where any explosive or blasting agent is to be transferred from a designated storage place to other designated storage places or points of use, the transfer shall be done without undue delay.





Hazardous Substance Storage

✦ VERY POOR

- Liquid chemicals uphill from solids
- Stored on wooden pallets
- Unstable ground/poor practices
- Standing diesel in containment facilities

















Debrief Recommendations

- ✦ Fire staff receive 1st Response Training
 - 12 hour NFPA 471 & 472
- ✦ E P Officer Liaison position
- ✦ MOU's be developed with private Hazmat companies (major cities)
- ✦ Hazardous Sites identified on our Values at Risk website
- ✦ Fire staff access to industry emergency & Pre-incident plans

Hazardous Goods Management

- ✦ Do not add water – prior to or after it catches on fire
 - Oxidizes – toxic fume
 - Incomplete burn is worse
 - Toxic sludge and runoff
- ✦ Let burn – hotter the better
- ✦ **Evacuate**

End Results - Mine

- ✦ Mine received significant amount of “Free” consultation work
- ✦ Mine forced to bring in consultants at their expense
 - Chemical storage
 - Emergency and Incident Preplanning
- ✦ Interested in receiving some WUI training

Conclusion

- ◆ Fires did not reach mine site
- ◆ Good lessons learned
- ◆ Built positive relations with mine staff and EP staff
- ◆ Plan to have a follow up debrief just on the mine incident

Questions?

