Objectives

• What is the IMR
• IMR H&S Technical Advisory Committee
• Reach of our UA Mining Program collaborative
• How UA College of Public Health fits with Mining S&H
• Resource Center Website
  – Operator support for IH and Exposure Compliance
    • Resources,
    • Training, and
    • Services.
J. David Lowell
Institute for Mineral Resources (IMR)

• Advance **scientific**, **technological**, and **educational** aspects of mineral **discovery**, **extraction**, and **processing**.

• Build long-term capacity and pursue research addressing challenges in:
  – mineral resources discovery,
  – development, and
  – existing mineral extraction operations.
Foundational IMR Themes

• Health and Safety
• Resources
• Technology
• Environmental and Social Responsibility
• Policy and Economics
IMR Research Themes

• Ensuring healthy and safe communities and workforces
• Lowering the fresh water consumption in mineral processing
• Lowering energy consumption in the mining and processing cycles and investigating alternative energy generation at mine sites
• Improving our understanding of the global mineral resource inventory
• Optimizing mine operations
• Informing policy
IMR - H&S Technical Advisory Committee

- Partners
  - Anglo American
  - Barrick Gold
  - BHP Billiton
  - Caterpillar
  - Freeport McMoRan
  - Newmont Mining
  - Peabody Energy
  - Resolution Copper
  - Rio Tinto
  - Salt River Materials Group
  - Vulcan Materials
  - 3-M Company
IMR - H&S TAC

• Broad representation
  – Surface and underground
  – Metal/non-metal, coal, aggregate sectors
  – Equipment manufacturing
• Industry-wide needs assessment
  – Research and training
• University Capabilities Assessment
• Setting priorities
  – E.g. noise controls for driving shaft, supervisor training, health economics, wellness...
IMR H&S TAC

Mission:
Through cooperation between industry and academia,...

improve the health and safety of miners throughout the world.
   – risk identification,
   – measurement, and
   – control.
Who are the players at UA

College of Public Health

IME

School of Mines

Western Mining Safety and Health Training Resource Center
Mel and Enid Zuckerman College of Public Health

The Mel and Enid Zuckerman College of Public Health is dedicated to promoting the health of communities in the southwest and globally with an emphasis on achieving health equity through excellence in education, research and service.
Mining Education

– Adult Learner
  • Mining Train-the-trainer techniques
– ESL/Low Literacy Training
– Culture-specific Training
– Program and Training Effectiveness Evaluation
Department of Mining and Geological Engineering

– Over 120 years of minerals engineering, science, and education.

– Henry G. “Hank” Grundstedt San Xavier Underground Mining Laboratory
  • Student Run
  • 3 active underground levels
College of Public Health

Environmental and Occupational Health

– Since 2000, first and only nationally accredited college of public health in AZ.
– IH and Environmental Tracks
– MPH, MS, PhD
– H&S Research and Training
Mining Activities

• Research
• Education
• Service
COPH Mining Health and Safety Program

• Promote healthy and safe workforces and communities
  – Implement and measure the effectiveness of risk management interventions
  – Evaluate Corporate-level Safety Systems and Wellness Programs
  – Determine the health impacts of bio- and synthetic diesel

• Develop effective safety systems and training
  – Incorporate behavioral aspects of safety training and systems
  – Implement training simulators
  – Research safety and health applications of underground communications system

• Address needs of indigenous populations
  – Measure airborne dust from historic uranium mining on the Navajo Nation
UA Mining H&S Personnel and Resources

• New hires
  – Terry Stobbe, PhD, CIH, CSP (April 2010)
  – Eric Lutz, PhD, industrial hygienist (July 2010)
  – Shannon Newton, MPH, CIH (January 2011)

• Primary Existing H&S Faculty
  – Mary Poulton
  – Ros Hill
  – Jeff Burgess
  – Paloma Beamer
  – Miranda Loh
Improved San Xavier Mining Laboratory facilities

Before

After
New Instrumentation

- Fast Mobility Particle Sizer (2nm-750nm)
- Portable Multi-gas UV-Spectrometer
- 2-portable real-time Black Carbon Aethalometers
- Ventilation Multi-meter
- Real-time Multi-gas Meter
- 4-Noise Dosimeters
Mining H&S Research

• Thermal Stress
• Noise
• Biodiesel Exposures
• Controls Cost Evaluations
• Exposure-Health Risk Factors
• H&S Training Methodology
• Health Systems Cost Eval.
Additional Mining Research Activity

- **Biodiesel**
  - SX mine exposure assessment
  - Resubmit NIOSH R01 proposal

- **Community Exposures**
  - Complete analysis of Shiprock samples (started 2/11)
  - Begin sample collection in Churchrock (start in 3/11)

- **Develop Exposure Assessment Toolbox**

- **Continue NIOSH Miner Training**
  - Ongoing and expanding

- **TAC face-to-face meeting April 31 and Broad Mining Community/University H&S Workshop on May 1, 2011**
  - Set next research and training priorities
  - Guide Risk Management development
Risk Management

• Evaluate risk management program
  – Submitted to Newmont
  – Assisted by Eller College of Business and HOPE Center, UA

• Other achievements
  – Jim Joy, PhD, brought to AZ (Nov. 2009)
    • Worked with SFAz faculty and industry partners (Sierrita and Resolution)
  – Completed a NIOSH-sponsored severe injury study
    • Demonstrated U.S. coal mines with a severe injury had a two-fold risk of fatalities the following year; and
    • Identified technological interventions
  – Initiated a NIOSH R01 risk management project with the Tucson Fire Department
Biodiesel Study

- Newmont requested evaluation of health effects of exposure to diesel particulate matter (DPM)
  - Interdisciplinary project team assembled and protocol designed
  - Selected mining vehicles (1 LHD, 1 generator, 1 welder)
  - Arranged for donation of diesel/biodiesel blends
  - Completed exhaust chamber assembly
  - Purchased monitoring instrumentation
  - Phase 1 & 2 experiments complete
  - Phase 3 experiments scheduled
Community Exposure

• PM2.5 monitoring on the Navajo Reservation at a uranium mine tailing site and a nearby community
  – Marin Robinson, PhD, (NAU) and Pierre Herkes, PhD (ASU)
  – Completed 12 weeks of sampling in Shiprock (community site); sampling currently underway in Churchrock (tailings site)
Windblown Dust: Shiprock, NM

• 12 PM$_{2.5}$ samples were collected and analyzed over 3 months in 2009 and 2010
• Average PM$_{2.5}$ concentration was $\sim$10 µg/m$^3$

Elemental composition of PM$_{2.5}$
• 6 soil elements were most abundant (0.1 to 1.0 µg/m$^3$): Al, Si, S, K, Ca, and Fe
• 24 trace elements were detected (0.1 to 14 ng/m$^3$)
• 9 trace elements were $>500$ x crustal abundance: Se, Br, Sb, S, Ag, Cd, Mo, B, Bi
• Se was 41,000 x crustal abundance
Mining S&H Resource Website

www.miningsh.arizona.edu

• Increased Exposure Assessment Focus under 56/57.5002
  – MSHA focus on DPM, 5001(a), Asbestos, Noise, and Radon

• UA to provide **IH Web Toolbox**
  – Operators with no on-site IH support
    • IH guidance (online, phone)
    • Onsite Assessments/Training
    • Data Interpretation
    • Control Recommendations
Mine Health

UA Mining H&S Program will have Significant Presence at the Western Mining Safety and Health Conference in October, 2011

Posted by Mine-Health at 08/31/2011 - 9:28am
UA faculty, staff, and students will have substantial presence at the Western Regional Mining Safety and Health Conference in Henderson, NV this October (http://www.cvent.com/events/7th-annual-joint-western-regional-mine-safety-and-health-conference/event-summary-d6bb8c77119a244ab79e077b1647ed5.aspx).

Read full post...

How long do we have to wait for a MSHA/Operator Voluntary Compliance Partnership (VCP)?

Posted by Mine-Health at 07/08/2011 - 12:03pm
Why does MSHA not have an active VCP? When attempting to influence the behavior of others to perform their activities with greater care, responsibility, and thoughtfulness punitive threats for compliance are never as efficient as partnership. In a 2003 review of MSHA Inspection Programs, conducted by ICF Consulting, they found that "data indicate...numbers and types of days lost injuries occurring over the past 5 to 10 years are not well correlated either quantitatively or qualitatively with the citations issued through inspection enforcement activities." The ICF Mine Inspection Program Evaluation Report went on to state, "We recommend that MSHA implement MNM's VCP initiative...". And yet, a MSHA VCP is non-existent.

Read full post...

Inaugural Mine Health and Safety Technical Advisory Workshop

Posted by Mine-Health at 04/02/2011 - 11:00am
Imagine eight mining health and safety executives/managers representing regional-to-global surface

http://www.publichealth.arizona.edu/blogs/mine-health
Mining H&S Service

• Company-specific IH Training
  – Dust, Noise, Safety, DPM, Chemical, General IH

• Company-specific Corporate Program Development
  – IH
  – Safety
  – Health Programs
Service, continued

• UCLA Partnership – So Cal ERC (NIOSH)

• Mining H&S Train-the-Trainer Program through the Center for Western Mining Safety and Health Training
MISL

- Keynote
  - HL Boling
- Legal
  - Mark Savit

MINING INSTITUTE FOR SUPERVISOR LEADERSHIP

In Partnership With:

ATTENTION MINING SUPERVISORS, MANAGERS, AND EXECUTIVES!

Register for this unique, mentored, leadership program that will provide YOU with the training to effectively lead miners using techniques that balance safety with optimized operations. Sessions will be lead by Top Mining Industry Leaders in leadership, legal, communication, and health/safety representing both open pit and underground operations.

This 2-day MISL program will provide the opportunity for active participation in:
- Culture-specific Communication
- Legal Issues
- Hazard Identification
- Conflict Resolution
- Optimized Workplace Training and Meetings
- Time Management
- Leadership, and
- Team-Building Skills

At the end of the course, each participant will be assigned a professional mentor who will guide the application and incorporation of the MISL techniques into daily work activities. Participants will present during the April MISL, either in person or via video link, and become mentors for new incoming participants.

Cost of the MISL program: $1,295 – this includes all MISL training and materials, 3-nights of lodging at the Canoa Ranch Resort, all meals on 2 MISL instruction days, and transportation between the hotel and institute. Institute will be held at the UA SX Mining Laboratory Training Center.

Timeline:
1. 2-day MISL course* December 1-2, 2011
2. Training project with mentor guidance April 26-27, 2012

* Participants must agree to the full program upon registration.

Don’t Wait! This unique program is limited to the first 30 registrants. Contact Shannon Newton at senewton@email.arizona.edu for more information, or visit our website at http://www.miningsh.arizona.edu.
Mining Institute for Supervisor Leadership (MISL)

• 1-year Mentor/Mentee Program, beginning with 2-day onsite Institute (December 1-2, 2011 and April 26-27, 2012)
• TAC as initial trainers/mentors for first cohort.
• Limited enrollment to 30.
• Non-didactic, adult learner-focused ACTIVE program.
Summary - UA Mining H&S Program

• IMR
• IMR TAC
• Western Mining Safety and Health Training Resource Center
• Mining Resource Website
  – IH Resources
• Research
• Training – UA degree and certification programs
• Services – MISL, Health Program, Safety, and IH support
Questions?

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