

NATIONAL TECHNICAL TRAINING CATALOG FY 2009

Includes:

- National Technical Training Program
- Technical Innovation and Professional Services
- AVS

U.S. Department of the Interior



Office of Surface Mining Reclamation & Enforcement
National Technical Training Program



FOREWORD

It is my pleasure to provide you with the Office of Surface Mining Reclamation and Enforcement's (OSM) Technical Training Catalog for both technical and programmatic courses offered for this Fiscal Year. This Catalog includes offerings for the National Technical Training Program (NTTP) and Technical Innovation and Professional Services (TIPS).

OSM's principal goal is to provide a stable regulatory environment based on sound science so landowners, coal operators, activists, state and Federal regulators and local residents all have a common understanding of the rights and responsibilities associated with surface coal mining under SMCRA. NTTP provides instruction modules on state of the art information to support the Forestry Reclamation Approach (FRA) to reclaim coal mined land in the Soils and Revegetation, Erosion and Sediment Control, and Excess Spoil Handling and Disposal in Steep-Slope Topography courses. Training is the foundation upon which this stability rests.

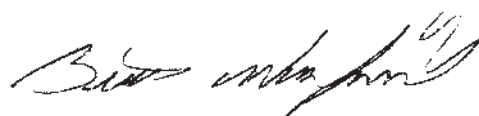
Whether you are a seasoned veteran seeking to stay abreast with technology or a new employee building your technical expertise, OSM's technical training provides participants with a common understanding of the regulations, advances in science and technology and how to apply them successfully and consistently.

OSM strives to further reclamation based on sound science by encouraging technical innovation through applied science and by promoting these advances throughout the coalfields. This training program provides a tool to disseminate these advances and improve the technical skills and professionalism of state, tribal, and Federal personnel. It provides the knowledge and skills necessary to develop creative responses to implement effective surface mining and reclamation programs.

Throughout the program, we strive to give each of you an opportunity to share your own experiences and innovative successes while gaining from the experiences of others. This spirit of cooperation, communication, and consultation are the hallmarks that make this training program successful. Every aspect of this training, from identifying needs through course development and presentation, are cooperative efforts of state, tribal, and OSM offices. This joint effort—in the classroom and out—exemplifies the cooperation, communication, and consultation between OSM and local agencies which fosters good conservation practices.

I sincerely appreciate the valuable time, efforts and talents of those enthusiastic volunteers who enhance the technical expertise of state, tribal, and OSM professionals as instructors. It is a tribute to them that NTTP's and TIPS' customer satisfaction ratings have remained high over the past years of the program. The dedication and insight of the many state, tribal and OSM volunteer trainers have resulted in the steady improvement in the regulation and reclamation of surface coal mining. As a result, there is a continuing high demand for new NTTP and TIPS training courses.

I am committed to OSM's technical training. It is essential to our mission. I look forward to the accomplishments we will achieve together in the future. I fully encourage your participation in this valuable program during the coming years.



Brent Wahlquist
Director
Office of Surface Mining

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INTRODUCTION

This catalog is a comprehensive source of information on technical training courses offered between October 1, 2008, and September 30, 2009, by the Office of Surface Mining Reclamation and Enforcement (OSM). The catalog describes the courses OSM offers to State, Federal and Tribal personnel in FY 2009. You can find:

- the current calendar for the National Technical Training Program at http://www.tips.osmre.gov/training/tips_html/links_nttp.htm and for the Technical Innovation and Professional Services at <http://www.tips.osmre.gov/training/>.
- the course descriptions in three sections—National Technical Training Program (NTTP) Offerings, Technical Innovation and Professional Services (TIPS) Offerings and Additional Offerings. Contact phone numbers and addresses are listed for all courses in each section.
 - ◊ The NTTP courses are for both new and experienced AML, inspection and enforcement, program, permitting, and technical staff.
 - ◊ TIPS Training Program offerings are customized training on TIPS software offered at TIPS Training locations in the Appalachian Region (AR), Mid-Continent Region (MCR), and Western Region (WR) offices, as well as on-site at customer locations upon request. Offerings include courses for AML, permitting, and technical and inspection staff.
 - ◊ An additional course is offered from OSM’s Applicant Violator System (AVS) Office on AVS: Basic Applicant/Violator System usage.

TIPS Training also offers on-line courses through DOI Learn and ESRI. On-line training provides flexibility and convenience, and employees can train at their own pace from the comfort of their office or home. See the TIPS Training website at <http://www.tips.osmre.gov/training/> for additional on-line course information.

At the request of the Steering Committee members, NTTP and TIPS are pleased to offer a training *Career Series Guide* to be used in conjunction with this catalog. The *Guide* is a collection of NTTP and TIPS training courses specific to different job descriptions within SMCRA agencies. It was designed to help employees and their managers select appropriate training courses based on an individual’s strengths, challenges and existing background knowledge and training. The *Guide* also identifies the progression and general sequencing of career specific training. It was developed by State, Federal and Tribal training experts in the NTTP and TIPS training program as an outline of the general sequencing of available courses. You can request a copy by contacting the National Technical Training Program at (202) 208-2769.

SUPERVISOR’S NOTE

We rely on the judgment of supervisors to ensure that the correct personnel are **nominated** to attend courses. Please carefully read the “**WHO SHOULD ATTEND**” and “**COMMENTS**” sections, or call the contact number listed for the course to determine the correct student audience. Also, please remember that the purpose of courses is to provide instruction in technical subject matter and not specific guidance in regulatory or policy matters.

If you are disabled and need accommodations to participate in these training sessions, contact individuals listed on pp. A-iii, B-iii, and C-iii.

For further information, please contact:

U.S. Department of the Interior
Office of Surface Mining Reclamation and Enforcement
National Technical Training Program
1951 Constitution Ave., N.W., Room 210 - SIB
Washington, D.C. 20240
Telephone: (202) 208-2769
Fax No.: (202) 219-3111

NATIONAL TECHNICAL TRAINING PROGRAM STEERING COMMITTEE

The National Technical Training Steering Committee exists for the purpose of identifying OSM, State and tribal training priorities, recommending training policies, providing guidance to assure the use of creative and innovative training opportunities and performing periodic evaluation of training activities to assure the quality of the program. The Committee reviews plans for proposed technical training activities and recommend priorities for new course development. Additionally, the Committee reviews the results of the Needs Survey and determines how requests for spaces in the courses will be accommodated.

Members serve as the primary vehicle of communication for the offices they represent on all policy and procedural matters related to the technical training program. The Committee meets twice a year (usually February and July). Committee members survey training contacts in the offices they represent prior to meetings to identify and discuss issues to be considered by the Committee.

NATIONAL TECHNICAL TRAINING PROGRAM STEERING COMMITTEE

STATE MEMBERS	REPRESENTING
<p>David Berry CO – Division of Minerals & Geology 1313 Sherman Street, Room 215 Denver, CO 80203 (303) 866-4938 Fax No. (303) 832-8106 E-MAIL: david.berry@state.co.us</p>	<p>Colorado Montana North Dakota Wyoming</p>
<p>Steve Hohmann KY – Division of Abandoned Mined Lands 2521 Lawrenceburg Road Frankfort, KY 40601 (502) 564-2141 Fax No. (502) 564-6544 E-MAIL: steve.hohmann@ky.gov</p>	<p>State/Tribal AML Offices</p>
<p>Carl Campbell KY – Department of Natural Resources 2 Hudson Hollow Road Frankfort, KY 40601 (502) 564-6940 Fax No. (502) 564-5698 E-MAIL: carl.campbell@ky.gov</p>	<p>Kentucky Ohio</p>
<p>Melvin Hodgkiss TX – Railroad Commission Division of Surface Mining P.O. Drawer 12967 Austin, TX 78711 (512) 463-6901 Fax No. (512) 463-6709 E-MAIL: melvin.hodgkiss@rrc.state.tx.us</p>	<p>Arkansas Kansas Mississippi Missouri Oklahoma Texas</p>
<p>J. Scott Roberts PA – Department of Environmental Protection P. O. Box 2063 Harrisburg, PA 17105-2063 (717) 783-9958 Fax No. (717) 783-0930 E-MAIL: jayroberts@state.pa.us</p>	<p>Maryland Pennsylvania</p>
<p>Tim Taylor IN – Department of Natural Resources Division of Reclamation Route 2, Box 129, State Road 48 West Jasonville, IN 47438 (812) 665-2207 Fax No. (812) 665-5041 E-MAIL: ttaylor@reclamation.dnr.state.in.us</p>	<p>Alabama Illinois Indiana Iowa Louisiana</p>
<p>Benny Wampler VA – Department of Mines, Minerals & Energy P.O. Drawer 900 Big Stone Gap, VA 24219 (276) 523-8145 Fax No. (276) 523-8148 E-MAIL: benny.wampler@dmme.virginia.gov</p>	<p>Virginia West Virginia</p>
<p>Vacant</p>	<p>Alaska New Mexico Utah</p>

NATIONAL TECHNICAL TRAINING PROGRAM STEERING COMMITTEE

OSM MEMBERS	REPRESENTING
<p>Sarah Donnelly (ex officio) OSM -National Technical Training Program 1951 Constitution Ave., N.W., Room 210 - SIB Washington, DC 20240 (202) 208-2826 Fax No. (202) 219-3111 E-MAIL: sdonnelly@osmre.gov</p>	<p>DSM Solicitors Headquarters</p>
<p>Len Meier OSM – Mid-Continent Region 501 Belle Street, Room 216 Alton, IL 62002 (618) 463-6463 ext. 5109 Fax No. (618) 463-6470 E-MAIL: lmeier@osmre.gov</p>	<p>OSM – Mid-Continent Region</p>
<p>Rick Holbrook OSM – Western Region 1999 Broadway, Suite 3320 Denver, CO 80202 (303) 293-5030 Fax No. (303) 293-5032 E-MAIL: rholbrook@osmre.gov</p>	<p>OSM – Western Region: Denver</p> <p>Western Field Offices: Albuquerque & Casper</p>
<p>Nancy Roberts OSM – Charleston Field Office 1027 Virginia Street East Charleston, WV 25301 (304) 347-7162 ext. 3043 Fax No. (304) 347-7170 E-MAIL: nroberts@osmre.gov</p>	<p>Pittsburgh Field Division Offices: Columbus, Harrisburg, Johnstown & Pittsburgh</p> <p>Appalachian Field Offices: Big Stone Gap, Charleston, Knoxville & Lexington</p>
<p>Vann Weaver OSM – Appalachian Region Pittsburgh, PA 15220 (412) 937-2858 Fax No. (412) 937-2177 E-MAIL: vweaver@osmre.gov</p>	<p>OSM – Appalachian Region: Pittsburgh</p>
<p>Billie Clark OSM – Western Region 1999 Broadway, Suite 3320 Denver, CO 80202 (303) 293-5055 Fax No. (303) 293-5058 E-MAIL: bclark@osmre.gov</p>	<p>Technical Innovation & Professional Services (TIPS) Albuquerque & Casper</p>
<p>Sherry Wilson OSM – Birmingham Field Office Barber Business Park 135 Gemini Circle, Suite 215 Homewood, AL 35209 (205) 290-7282 ext. 16 Fax No. (205) 290-7280 E-MAIL: swilson@osmre.gov</p>	<p>Alton Field Division, Indianapolis Area Office Birmingham Field Office Tulsa Field Office</p>
<p>Allen Kraps OSM – Columbus Field Office 4605 Morse Road, Room 102 Columbus, OH 43230 (614) 416-2238 ext. 107 Fax No. (614) 416-2248 E-MAIL: akraps@osmre.gov</p>	<p>Instructor Advisory Council</p>

**NATIONAL TECHNICAL TRAINING
PROGRAM OFFERINGS**

NATIONAL TECHNICAL TRAINING PROGRAM (NTTP) CONTACT

Sarah E. Donnelly
Office of Surface Mining Reclamation and Enforcement
National Technical Training Program
1951 Constitution Ave., N.W., Room 210 - SIB
Washington, DC 20240
(202) 208-2826
Fax No. (202) 219-3111
E-mail: sdonnelly@osmre.gov

NATIONAL TECHNICAL TRAINING PROGRAM STAFF

PROGRAM MANAGER: Sarah Donnelly, (202) 208-2826

E-MAIL: sdonnelly@osmre.gov
Instructor Training Course (ITC)
Master Instructor Forum (MIF)

COURSE MANAGER: Ann Walker
(202) 208-2824 E-mail: awalker2@osmre.gov

Acid-Forming Materials Workshop: AML (AAML)
Acid-Forming Materials: Fundamentals and Applications (ACF)
Acid-Forming Materials Workshop for Program Staff (APS)
Enforcement Tools & Applications (ETA)
Geology & Geochemistry of Acid-Forming Materials (GGCA)
OSM Orientation Program
Passive Treatment (PAS)
Subsidence (SUB)
Underground Mining Technology (UMT)

COURSE MANAGER: Norman Hess
(202) 208-2635 E-mail: nhess@osmre.gov

AML Design Workshop: Dangerous Highwalls (AMLDH)
AML Design Workshop: Dangerous Openings (AMLDO)
AML Design Workshop: Fires (AMLF)
AML Design Workshop: Landslides (AMLL)
AML Design Workshop: Subsidence (AMLS)
AML Drilling & Grouting (AMLDG)
AML Realty (AMLR)
Applied Engineering Principles (AENG)
Enforcement Procedures (ENF)
Evidence Preparation and Testimony (EVI)
Expert Witness (EXW)
Permit Findings Workshop (PFW)
Wetlands Awareness (WET)

COURSE MANAGER: Patricia Hairston
(202) 208-2847 E-mail: phairston@osmre.gov
NTTP/TIPS Needs Survey
Basic Inspection Workbook (BAI)
National Technical Training Catalog

COURSE MANAGER: James Kennedy
(202) 208-2981 E-mail: jkennedy@osmre.gov

AML Reclamation Projects (AREC)
Bonding Workshop: Cost Estimation (BNC)
Erosion and Sediment Control (ERS)
Forensic Hydrologic Investigation (FHI)
Permitting Hydrology (PHY)
Quantitative Hydrogeology (QHG)
Soils and Revegetation (SOI)
Surface and Groundwater Hydrology (SGW)
SMCRA Permitting and the Endangered Species Act:
Implementation of the 1996 Biological Opinion (ESA)

COURSE MANAGER: Jane Stieber
(202) 208-0871 E-mail: jstieber@osmre.gov

Advanced Blasting: Investigation and Analysis of Adverse Effects
Blasting and Inspection (BLI)
Bonding Workshop: Administrative and Legal (BNA)
Coalfield Communications: How to Get it Right! (CCOM)
Effective Writing (EFW)
Excess Spoil Handling and Disposal (ESHD)
Historical and Archeological Resources (HAR)
Historical and Archeological Resources: Update and Refresher (HARR)
NEPA Procedures (NEPA)
Principles of Inspection (POI)

COMPUTER SPECIALIST: Clara Carter
(202) 208-2543 E-mail: ccarter@osmre.gov

COURSE SESSION COORDINATORS:

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Mary Dyson
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Mae Kimbrough
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Cheryl Morgan
(202) 208-5361 E-mail: cmorgan@osmre.gov

FAX No: (202) 219-3111

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NATIONAL TECHNICAL TRAINING PROGRAM TRAINING SCHEDULING AND NOMINATION PROCEDURES

Students are scheduled to attend National Technical Training Program (NTTP) courses according to the following steps which are shown on Figure 1.

1. ANNUAL NEEDS SURVEY. Each spring NTTP distributes the Needs Survey for courses for the following fiscal year to all State, Tribal and OSM technical training contacts.

Within 30 days of receipt of the survey, State, Tribal and OSM training contacts advise NTTP of their offices' needs for the upcoming year.

2. SPACE ALLOCATION. At the Summer Steering Committee meeting, Committee members review the Needs Survey results and recommend how student needs should be met in the upcoming year. Based on Committee recommendations, NTTP assigns students to courses. In making this assignment, the following factors are considered:

- ▼ Need of the Priority of the course (Priority 1 or 2)
- ▼ Proximity to students' offices
- ▼ Whether course materials are region-specific
- ▼ Season of year
- ▼ Where possible, minimize conflict with:
 - Students' normal workload
 - Other normally scheduled agencies' events
 - Competing courses

Space allocations and the course calendars are distributed to State, Tribal and Federal contacts prior to the beginning of the Federal fiscal year.

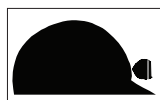
The Completion Report, which is a listing of course attendance for the previous fiscal year, is distributed to all affected offices each year.

3. COURSE REGISTRATIONS. Registrations are made through a web-based Department of the Interior system called DOI Learn. This system can be accessed at <https://doilearn.doi.gov>. OSM employees must log into DOI Learn with your user name and password to register for the class. If you are not an OSM employee, please select the Public Catalog Login to register. In the search field, you will type either NTTP or TIPS to be directed to those courses.

State, Tribal and OSM students who are requesting travel funding from NTTP must submit the NTTP Travel Information Sheet to the course coordinator as indicated on the training calendar.

Registrations for course sessions must be received by NTTP at least **eight** weeks before the scheduled date for each session. First consideration for space in course sessions will be given to State, Tribal, and Federal regulatory and reclamation program participants. Space will be made available to personnel from other governmental agencies, industry, and other interested organizations on a space-available basis.

All registrants will be notified of acceptance for a session four weeks prior to the session date. Substitutes will be accepted up to **two** weeks prior to the session date. Please notify NTTP as early as possible of any cancellations as insufficient enrollment will result in the cancellation of course sessions. If insufficient nominations are received, the session will be cancelled and nominees will be notified through their training contacts.



Field Exercises: All those attending courses which include a field exercise must bring specified equipment.

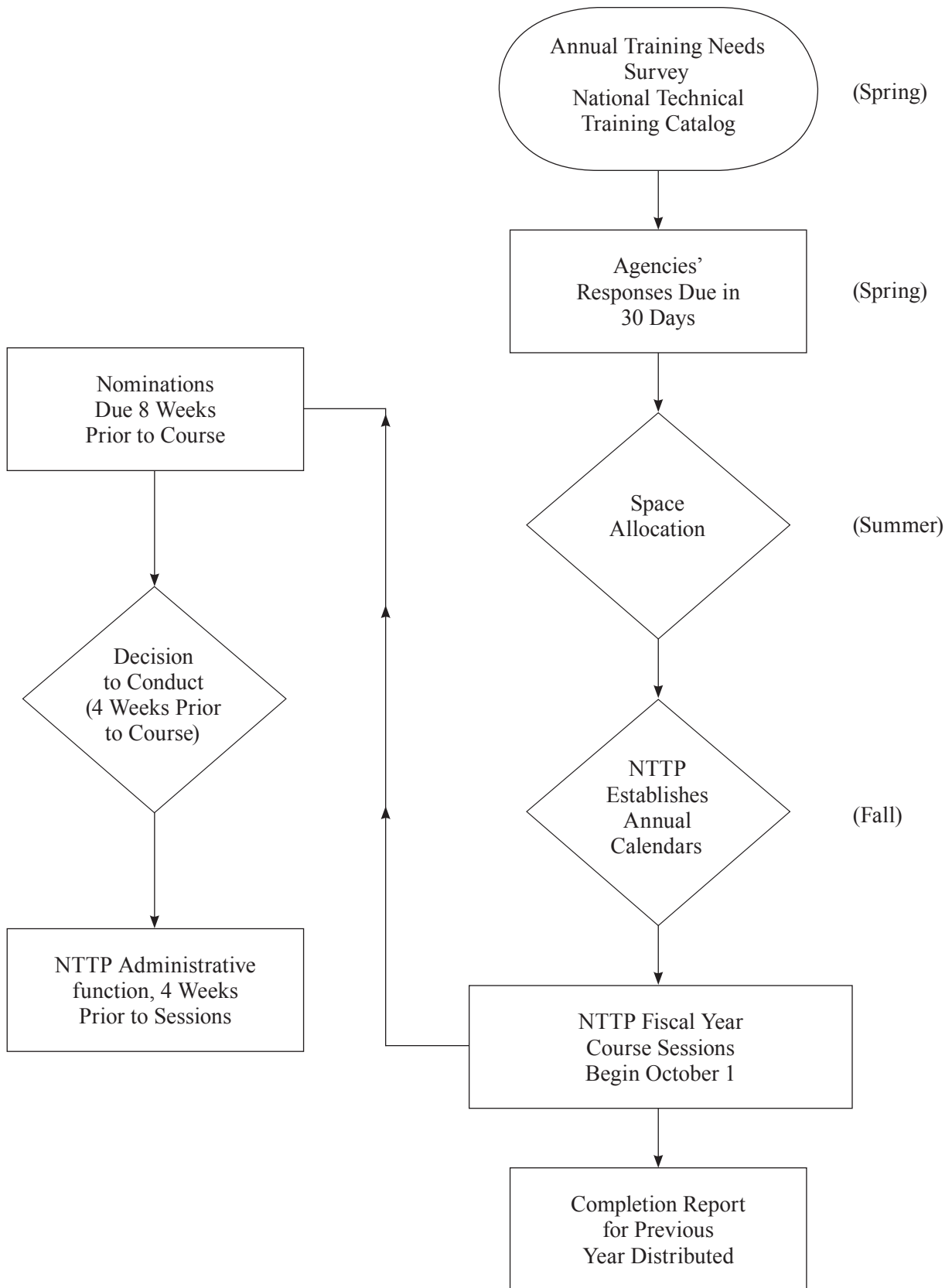


Figure 1. National Technical Training Program (NTTP) Training Nomination Procedure

NATIONAL TECHNICAL TRAINING PROGRAM COURSE DEVELOPMENT PROCESS

National Technical Training Program (NTTP) course offerings are developed and revised following the steps which are shown in Figure 2.

1. TRAINING NEEDS DETERMINED

The training program utilizes several sources to determine the current technical training needs of its students. These are periodic customer surveys which ask supervisors and training contacts what the needs of students in the offices presently are. NTTP staff reviews all comments on student evaluations to determine needs. Additionally, each office is contacted twice a year by their representative on the National Technical Training Steering Committee to determine new needs. Representatives present this information at the Summer and Winter Steering Committee meetings.

2. NEW COURSE APPROVAL PROCESS

Proposals for new courses are discussed at the Steering Committee meetings and the Committee reaches a consensus on whether a recommendation should be made for developing a new course. The recommendation to develop a new course is made to OSM's Assistant Director, Program Support who determines whether the course will be developed.

3. COURSE DEVELOPMENT

After the determination is made to develop a new course, NTTP identifies prospective members for the ad hoc course development team. Members are identified through discussions with current training program instructors, Steering Committee members, training contacts and other State, Tribal and Federal personnel who have responsibilities in the subject area of the new course.

Generally, it takes approximately one year to develop a new course. The development process includes writing lesson plans and student notes and holding course dry runs and pilots. After the pilot, any needed revisions are made to the course and the course is added to program offerings. As with all other courses, the process of fine-tuning the course is continual with instructors and NTTP staff reviewing student evaluations for each course session to see where the course might be improved.

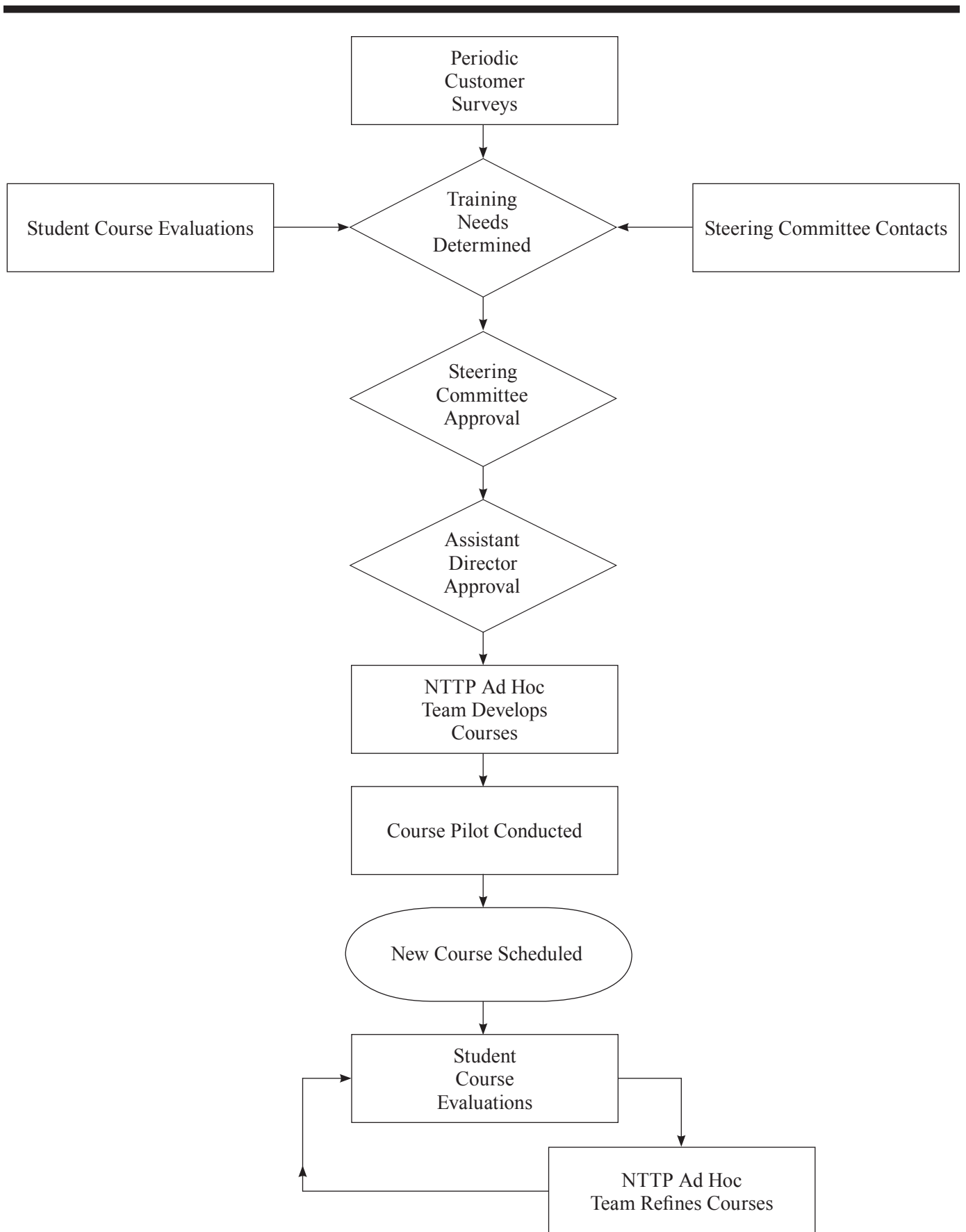
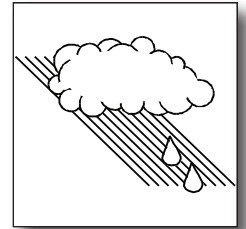


Figure 2. National Technical Training Program (NTTP) Course Development Process

Acid-Forming Materials: AML Workshop



This workshop provides information on the problems of acid-forming materials (AFM) and their impact on abandoned mine land (AML) project success and environmental remediation. A holistic, multidisciplinary methodology is used in the workshop to develop fundamental concepts and applications based on an ecosystem approach to reclamation, control of acid-forming materials, and prevention of acid-mine drainage. Participants play an integral role in the success of the workshop format, which will be based on discussion and information exchange. **Duration: 3½ days**

TOPICS COVERED

Introduction To Acid-Forming Materials

Origins of AFM and Fundamental Chemistry

Weathering of Acid-Forming Materials

AFM and AML Priority Rankings: An OSM Perspective

Evaluation of Drastically Disturbed Lands

Field Investigations

An Ecosystem Approach to Reclamation

Analytical Methods and Interpretation of Data

The Watershed Concept

Reclamation Landform Stability

Summaries of Field Investigations:
Problems and Solutions

State Case Studies

AML Problems and Solutions

WHO SHOULD ATTEND: Senior or experienced staff familiar with AFM and AML projects.

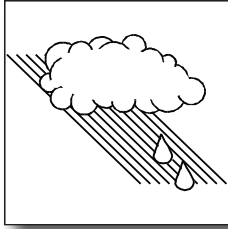
COMMENTS: All participants are required to submit an AML case study.

Students need to bring the following to class:

- ▶ calculator

Field Exercise: Steel-toed boots are required.

National Technical Training Program: (202) 208-2769



Acid-Forming Materials: Fundamentals and Applications

This course is designed to provide participants with basic information on the characteristics of potentially acid-forming materials, their oxidation, production of acid-mine drainage/related aquatic toxic materials and extremely acid materials, and potential for mitigation of these impacts. **Duration: 4 days**

TOPICS COVERED

Geology

- ▼ Fundamentals of Geology
- ▼ Role of Geology in Coal Mining Reclamation
- ▼ Depositional Environments
- ▼ Pyrite Formation
- ▼ Lithological Associations
- ▼ Geohydrology

Weathering and Soil-Forming Processes

- ▼ Acid-Forming Material Oxidative Processes
- ▼ Natural Disturbed Ecosystems

Acid Impacted Ecosystems

- ▼ Acid-Forming Material Impacts on Terrestrial Ecosystems
 - ◇ *Agriculture*
 - ◇ *Infrastructure Developments*
- ▼ Acid-Forming Material Impacts on Aquatic Resources/Ecosystems
 - ◇ *Fisheries*
 - ◇ *Irrigation and Related Agricultural*
 - ◇ *Uses of Water*

Sampling and Characterization Methodologies and Procedure

- ▼ Aquatic Resource Sampling and Characterization
- ▼ Sample Handling and Preparation for Terrestrial Ecosystem Characterization

Planning and Mitigation Options

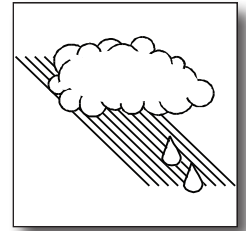
Mitigation of Acid Mine Drainage

WHO SHOULD ATTEND: Permitting specialists, inspectors and AML specialists.

Field Exercise: Hard hat, steel-toed boots, and safety glasses are required.

National Technical Training Program: (202) 208-2769

Acid-Forming Materials Workshop for Program Staff



This workshop provides an introduction to the state of the science and technology of acid-forming materials. It is designed for program staff, managers, attorneys and others who desire a general subject understanding. There is no expectation or intent to turn participants into technical experts. The workshop includes sections on acid formation and effects, the scientific methods, collection and analysis of data for planning and prediction, and preventive and mitigation techniques. A field trip is included to illustrate some of the concepts. **Duration: 2 days**

TOPICS COVERED

Introduction

- ▼ Problem Scope and Magnitude
- ▼ Where Are Acid-Forming Materials Found on Mine Sites?
- ▼ Brief History of Acid Materials
- ▼ Recognition and Research
- ▼ Misconceptions and Fallacies of Acid-Forming Materials

Acid Formation and Effects

- ▼ Acid Formation: Overview of Chemical and Mineralogical Processes
- ▼ Acid Neutralizers
- ▼ Acid-Forming Material Impacts on Aquatic Biota
- ▼ Native Ecological Systems, Soils, and Acid-Forming Materials: An Ecosystem Approach to Reclamation

Scientific Method and the Logic Prediction

- ▼ Definition of Scientific Method
- ▼ Brief History of the Philosophy of Science
- ▼ The Logic Behind Predictions

Data Collection, Analysis and Planning

- ▼ Sampling and Testing
- ▼ Overburden Sampling
- ▼ Overburden Analysis (Testing Methods)
- ▼ Evaluations of Previously Disturbed Sites

Prevention

- ▼ Other Postmining Water Quality Prediction Tools
- ▼ Alkaline Addition
- ▼ Alkaline Redistribution

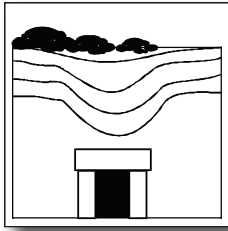
Mitigation

- ▼ Mitigation of Acid-Forming Materials Impacts-Terrestrial Environments
- ▼ Acid-Mine Drainage Mitigation
- ▼ Chemical Versus Passive Treatment
- ▼ Treatment Systems, Their Applications, Functions, and Limitations

WHO SHOULD ATTEND: Non-technical staff, program managers, administrative personnel, attorneys, and supervisors.

Field Exercise: Hard hats, steel-toed boots, and safety glasses are required.

National Technical Training Program: (202) 208-2769



AML Design Workshop: Dangerous Highwalls

This is a field-oriented course to assist AML field staff in the selection and design of reclamation methods. Course material will cover several abatement methods such as backfilling and grading, benching, barriers and netting. **Duration: 4 days**

TOPICS COVERED

This field-oriented workshop requires intensive interaction, relying on active student participation and the sharing of their AML reclamation design experience. Students will be required to develop conceptual designs, plans and specifications, and construction cost estimates.

- ▼ Introduction and Overview
- ▼ Definition of Terms
- ▼ Identification of Hazards
- ▼ Identify Reclamation Methods
- ▼ Site Characterization
- ▼ Develop a Site Map
- ▼ Develop Viable Reclamation Alternatives With the Pros and Cons Associated With Each
- ▼ Develop Final Design Including Bid Specifications, Plans/Drawing and Bid Items
 - ◇ *General Description of Work*
 - ◇ *Mobilization and Site Preparation*
 - ◇ *Construction Materials and Equipment*
 - ◇ *Site Restoration*
- ▼ Demobilization
- ▼ Method of Measurement and Payment
- ▼ Develop Cost Estimates

WHO SHOULD ATTEND: AML personnel (designers, project managers, engineers, geologists and inspectors).

COMMENTS: Students are encouraged to bring the following to class:

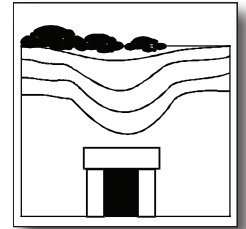
- ▶ Calculator
- ▶ Laptop computer (optional)
- ▶ Plans and specs of a reclamation method (hard copy and disk in Word) that student has developed or constructed
- ▶ Up to five digital images, photos, or slides of the above reclamation method

Be prepared to discuss the pros and cons of this reclamation method.

Field Exercise: Field boots and rain gear are required.

National Technical Training Program: (202) 208-2769

AML Design Workshop: Dangerous Openings



This is a field-oriented course to assist AML field staff in the selection and design of reclamation methods for vertical shafts, audits, and other mine openings. Course material will cover several abatement methods such as backfilling, plugs (concrete and polyurethane foam), and structural barriers (caps and grates). **Duration: 4 days**

TOPICS COVERED

This field-oriented workshop requires intensive interaction, relying on active student participation and the sharing of their AML reclamation design experience. Students will be required to develop conceptual designs, plans and specifications, and construction cost estimates.

- ▼ Introduction and Overview
- ▼ Definition of Terms
- ▼ Identification of Hazards
- ▼ Identify Reclamation Methods
- ▼ Site Characterization
- ▼ Develop a Site Map
- ▼ Develop Viable Reclamation Alternatives With the Pros and Cons Associated With Each
- ▼ Develop Final Design, including Bid Specifications, Plans/Drawing and Bid Items
 - ◇ *General Description of Work*
 - ◇ *Mobilization and Site Preparation*
 - ◇ *Construction Materials and Equipment*
 - ◇ *Site Restoration*
- ▼ Demobilization
- ▼ Method of Measurement and Payment
- ▼ Develop Cost Estimates

WHO SHOULD ATTEND: AML personnel (designers, project managers, engineers, geologist and inspectors).

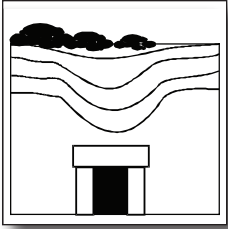
COMMENTS: Students are encouraged to bring the following to class:

- ▶ Calculator
- ▶ Laptop computer (optional)
- ▶ Plans and specs of a reclamation method (hard copy and disk in Word) that student has developed or constructed
- ▶ Up to five digital images, photos, or slides of the above reclamation method

Be prepared to discuss the pros and cons of this reclamation method.

Field Exercise: Field boots and rain gear are required.

National Technical Training Program: (202) 208-2769



AML Design Workshop: Fires

This is a field-oriented course to assist AML field staff in the selection and design of reclamation methods for both underground and refuse fires. Course material will cover several abatement methods such as excavation and extinguishment, isolation and cutoff trenches, surface covers, and injection of foaming mud. **Duration: 4 days**

TOPICS COVERED

This field-oriented workshop requires intensive interaction, relying on active student participation and the sharing of their AML reclamation design experience. Students will be required to develop conceptual designs, plans and specifications, and construction cost estimates.

- ▼ Introduction and Overview
- ▼ Definition of Terms
- ▼ Identification of Hazards
- ▼ Identify Reclamation Methods
- ▼ Site Characterization
- ▼ Develop a Site Map
- ▼ Develop Viable Reclamation Alternatives With the Pros and Cons Associated With Each.
- ▼ Develop Final Design, Including Bid Specifications, Plans/Drawing and Bid Items
 - ◇ *General Description of Work*
 - ◇ *Mobilization and Site Preparation*
 - ◇ *Construction Materials and Equipment*
 - ◇ *Site Restoration*
- ▼ Demobilization
- ▼ Method of Measurement and Payment
- ▼ Develop Cost Estimates

WHO SHOULD ATTEND: AML personnel (designers, project managers, engineers, geologists and inspectors).

COMMENTS: Students are encouraged to bring the following to class:

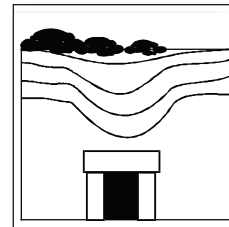
- ▶ Calculator
- ▶ Laptop computer (optional)
- ▶ Plans and specs of a reclamation method (hard copy and disk in Word) that student has developed or constructed
- ▶ Up to five digital images, photos, or slides of the above reclamation method

Be prepared to discuss the pros and cons of this reclamation method.

Field Exercise: Field boots and rain gear are required.

National Technical Training Program: (202) 208-2769

AML Design Workshop: Landslides



This is a field-oriented course to assist AML field staff in the selection and design of reclamation methods. Course material will cover several abatement methods such as buttresses, excavation, and retaining structures. **Duration: 4 days**

TOPICS COVERED

This field-oriented workshop requires intensive interaction, relying on active student participation and the sharing of their AML reclamation design experience. Students will be required to develop conceptual designs, plans and specifications, and construction cost estimates.

- ▼ Introduction and Overview
- ▼ Definition of Terms
- ▼ Identification of Hazards
- ▼ Identify Reclamation Methods
- ▼ Site Characterization
- ▼ Develop a Site Map
- ▼ Develop Viable Reclamation Alternatives With the Pros and Cons Associated With Each
- ▼ Develop Final Design Including Bid Specifications, Plans/Drawing and Bid Items
 - ◇ *General Description of Work*
 - ◇ *Mobilization and Site Preparation*
 - ◇ *Construction Materials and Equipment*
 - ◇ *Site Restoration*
- ▼ Demobilization
- ▼ Method of Measurement and Payment
- ▼ Develop Cost Estimates

WHO SHOULD ATTEND: AML personnel (designers, project managers, engineers, geologists and inspectors)

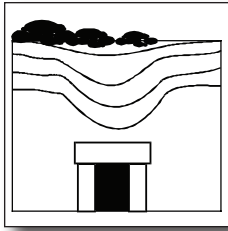
COMMENTS: Students are encouraged to bring the following to class:

- ▶ Calculator
- ▶ Laptop computer (optional)
- ▶ Plans and specs of a reclamation method (hard copy and disk in Word) that student has developed or constructed
- ▶ Up to five digital images, photos, or slides of the above reclamation method

Be prepared to discuss the pros and cons of this reclamation method.

Field Exercise: Field boots and rain gear are required.

National Technical Training Program: (202) 208-2769



AML Design Workshop: Subsidence

This is a field-oriented course to assist AML field staff in the selection and design of reclamation methods. Course material will cover several abatement methods such as grouting, flushing, pneumatic and hydraulic stowing, and column supports. **Duration: 4 days**

TOPICS COVERED

This field-oriented workshop requires intensive interaction, relying on active student participation and the sharing of their AML reclamation design experience. Students will be required to develop conceptual designs, plans and specifications, and construction cost estimates.

- ▼ Agenda
- ▼ Introduction and Overview
- ▼ Definition of Terms
- ▼ Identification of Hazards
- ▼ Identify Reclamation Methods
- ▼ Site Characterization
- ▼ Develop a Site Map
- ▼ Develop Viable Reclamation Alternatives With the Pros and Cons Associated With Each
- ▼ Develop Final Design Including Bid Specifications, Plans/Drawing and Bid Items
 - ◇ *General Description of Work*
 - ◇ *Mobilization and Site Preparation*
 - ◇ *Construction Materials and Equipment*
 - ◇ *Site Restoration*
- ▼ Demobilization
- ▼ Method of Measurement and Payment
- ▼ Develop Cost Estimates

WHO SHOULD ATTEND: AML personnel (designers, project managers, engineers, geologists and inspectors)

COMMENTS: Students are encouraged to bring the following to class:

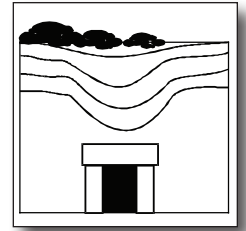
- ▶ Calculator
- ▶ Laptop computer (optional)
- ▶ Plans and specs of a reclamation method (hard copy and disk in Word) that student has developed or constructed
- ▶ Up to five digital images, photos, or slides of the above reclamation method

Be prepared to discuss the pros and cons of this reclamation method.

Field Exercise: Field boots and rain gear are required.

National Technical Training Program: (202) 208-2769

AML Drilling and Grouting



This is a classroom-oriented course designed to allow AML staff to evaluate when commitment of expenditures for drilling is appropriate in response to mine subsidence complaints, and to evaluate situations where commitment of expenditures for grouting is appropriate in response to mine subsidence complaints. **Duration: 4 days**

TOPICS COVERED

This classroom-oriented course provides participants with exposure to the methods and approaches utilized for drilling and grouting for the purpose of subsidence remediation across varying geological and geographical regions. The majority of the course is devoted to drilling for investigation, the design process, and construction methods for drilling and grouting projects.

There is also discussion on the monitoring of structures and contracting. Within these topics, funding and geology are inherent themes that are addressed throughout the training.

Definition of Terms

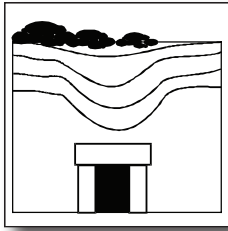
- ▼ Review of Basics
- ▼ Drilling/Investigation for Design
- ▼ Design Process for Drilling and Grouting
- ▼ Pre- and Post-Construction Monitoring
- ▼ Construction Methodologies for Drilling and Grouting
- ▼ Contracting

WHO SHOULD ATTEND: AML technical personnel including project designers and managers, engineers, geologists and inspectors. Completion of the “AML Design Workshop: Subsidence” is a prerequisite for this course.

COMMENTS: A series of case studies and classroom exercises are incorporated into this training. Each student is requested to bring an example case study/project to be used for illustration and/or discussion during class.

Field Exercise: None.

National Technical Training Program: (202) 208-2769



AML Realty

This course provides participants with detailed information and practical experience necessary to comply with realty aspects of the Surface Mining Control and Reclamation Act and other appropriate laws, regulations, and executive orders. **Duration: 3 days**

TOPICS COVERED

Eligibility

- ▼ Legal and Legislative Authority

Scope of Work

- ▼ Property Conditions
- ▼ Encumbrances
- ▼ Site Plans and Specifications

Title Examination and Rights of Entry

- ▼ Courthouse Research and Ownership Information
- ▼ Special Agreement Rights of Entry
- ▼ Dealing With Incidental Coal
- ▼ Police Powers
- ▼ Landowner Contacts

Appraisals and Liens

- ▼ Determining When an Appraisal is Appropriate
- ▼ Lien-Waiver Process
- ▼ Landowner Involvement

Documentation

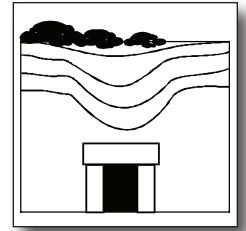
WHO SHOULD ATTEND: Federal and State AML staff who have contact with landowners, especially those responsible for obtaining access to private, corporate, and public lands on projects.

Field Exercise: None.

National Technical Training Program: (202) 208-2769

AML Reclamation Projects

This course provides participants with information about the principles of abandoned mine land project development and the “rule of thumb” for the onsite administration and inspection of construction projects. **Duration: 3½ days**



TOPICS COVERED

Project Development

- ▼ Historic Overview
- ▼ Project Identification
 - ◇ *Problem Type*
 - ◇ *Site Characteristics*
 - ◇ *Scope of Work*
- ▼ Design Development
 - ◇ *Reclamation Methods (pros & cons)*
 - ◇ *Land Use Considerations*
 - ◇ *Scheduling*
 - ◇ *Preparation of Specifications*

Project Administration

- ▼ Pre-bid Meeting
- ▼ Pre-construction Meeting
- ▼ Construction Inspection
 - ◇ *Role of Inspector*
 - ◇ *Government gets its money worth*
 - ◇ *Protect Public Interest*
 - ◇ *Require Full Performance*
 - ◇ *Keep work on schedule*
 - ◇ *Contractor receives payment*
 - ◇ *Contractor fulfilled Obligations*
 - ◇ *Know Contract Administration*
 - ◇ *Product of High Quality*
 - ◇ *Not Job Superintendent*
 - ◇ *Not Agency of Landowner*

- ▼ Inspection Requirements
- ▼ Reporting and Recording
- ▼ Final Inspection
- ▼ Post Construction Monitoring

Safety

- ▼ Construction Safety
- ▼ Video

AML Hazards

- ▼ Abandoned Structures/Equipment

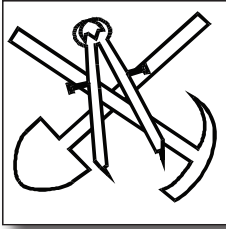
Field Exercises

- ▼ AML Site Investigation
- ▼ Active Construction Site
- ▼ Post Reclamation Maintenance

WHO SHOULD ATTEND: AML reclamation projects specialists and Bond forfeiture project specialists.

Field Exercise: Hard hat, hard-toed boots, and appropriate field attire are required.

National Technical Training Program: (202) 208-2769



Applied Engineering Principles

This course provides participants with knowledge of basic principles and “rules of thumb” that will enable them to read and use engineering plans and maps to conduct onsite inspections of structures and understand other engineering aspects of reclamation. **Duration: 4 days**

TOPICS COVERED

The Engineering Process

Earth Materials

- ▼ Introduction to Soil and Rock Engineering
- ▼ Soil Characterization
- ▼ Materials Strength
- ▼ Permeability and Pore Pressure
- ▼ Surcharge Loads, Settlement, and Consolidation
- ▼ Density of Soil and Compaction
- ▼ Durability
- ▼ Coal Waste
- ▼ Field Exploration/Sampling/Logging

Slope Stability

- ▼ Principles
- ▼ Illustrations/Terminology
- ▼ Exercises
- ▼ Problems

Water Management

- ▼ Hydrology
- ▼ Erosion
- ▼ Hydrolics
- ▼ Sediment Basins
- ▼ Other Drainage Control Structures
- ▼ Inspection of Earth Dams

Engineering Field Work

- ▼ Map and Plan Reading
- ▼ Measuring Techniques
- ▼ Field Methods

Field Exercise

Roads

Mining Equipment

WHO SHOULD ATTEND: Inspectors and permit, bonding, assessment, and abandoned mine land program specialists. Also for individuals who need an understanding of, but have not had completed academic or other training in engineering disciplines. At least six months experience on a regulatory program staff is recommended.

COMMENTS: Students need to bring the following to class:

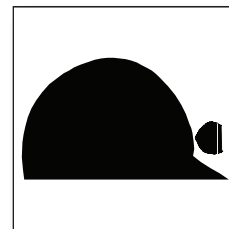
- ▶ Scientific Calculator

Field Exercise: Field boots and rain gear are required.

National Technical Training Program: (202) 208-2769

Basic Inspection Workbook

This self-study course provides new inspectors with an introduction to the inspection and enforcement aspects of regulatory programs. The workbook is designed for use in conjunction with applicable regulatory program requirements.



TOPICS COVERED

Overview of Surface Mining Activities

- ▼ Sequence of Surface Mining Activities
- ▼ Surface Mining Equipment
- ▼ Regional Characteristics of Surface Mines
- ▼ Surface Mining Techniques

Inspection Responsibilities

- ▼ Preparation for an Inspection
- ▼ Inspection Procedures

Enforcement Responsibilities

- ▼ Enforcement Actions
- ▼ Alternative Enforcement Techniques
- ▼ Penalty Assessments
- ▼ Appeals and Hearings

Material Handling and Storage

- ▼ Removal of Vegetation
- ▼ Soil Handling Procedure
- ▼ Removal and Storage of the Overburden
- ▼ Special Categories of Mining

Hydrologic Standards

- ▼ Surface Water Hydrology
- ▼ Inspection of Drainage Control Structures
- ▼ Other Surface Water Concerns
- ▼ Groundwater Hydrology
- ▼ Acid-Mine Drainage
- ▼ Monitoring and Water Rights
- ▼ Water Sampling Procedures

Blasting Standards

- ▼ Types of Explosives
- ▼ Public Safety
- ▼ Control of Adverse Effects
- ▼ Citizen Complaints
- ▼ Blasting Records
- ▼ On-Site Inspections

Reclamation

- ▼ Backfilling and Grading
- ▼ Replacement of Topsoil
- ▼ Revegetation
- ▼ Bond Release

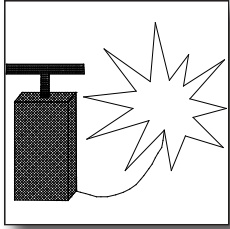
Surface Effects of Underground Mining

- ▼ Differences Between Surface and Underground Operations
- ▼ Methods of Underground Mining
- ▼ Inspector Responsibilities

WHO SHOULD ATTEND: New inspectors with less than six months of surface mining experience.

COMMENTS: No in-class sessions are held for this self-study course. Please call (202) 208-2769 to obtain copies of the workbook.

National Technical Training Program: (202) 208-2769



Blasting and Inspection

This course provides training for inspectors to understand the basic principles of blasting and environmental effects. Focus will be on compliance with regulations and blast-site inspections. **Duration: 3 days**

TOPICS COVERED

Introduction and Blasting Overview

Blasting

- ▼ Explosives Characteristics
- ▼ Initiation Systems
- ▼ Blast Design
- ▼ Blast Records and Inspection

Adverse Effects

- ▼ Vibrations and Blasting Seismographs
- ▼ Blast Waveform Interpretation
- ▼ Ground Vibration Limits
- ▼ Airblast Limits
- ▼ Flyrock Limits

Performance Standards

- ▼ Warning Signals and Blasting Schedules
- ▼ Preblast Survey
- ▼ Permit Blast Plans
- ▼ Inspector Safety
- ▼ Mine Site Inspection

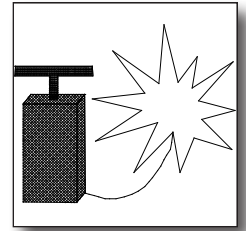
WHO SHOULD ATTEND: Inspectors, permit staff, entry-level personnel wanting blasting training and experienced personnel wanting refresher training.

COMMENTS: Students need to bring the following to class:

- ▶ Calculator
- ▶ Problematic Blast Logs

National Technical Training Program: (202) 208-2769

Advanced Blasting: Investigation and Analysis of Adverse Effects



This course provides advanced blasting training for regulatory personnel who evaluate the adverse effects of blasting. It focuses on gathering and analyzing information that will assist in resolving citizen complaints from ground vibrations, air blast, flyrock, and fumes. **Duration: 3½ days**

TOPICS COVERED

Introduction

- ▼ Why We Review Citizen Complaints

Blast Log Review

- ▼ Terminology
- ▼ Cross-Tabulating Data Fields
- ▼ Blast Log in Compliance with Regulations
- ▼ Calculate Scaled Distance and Maximum Charge Weight
- ▼ Signs of Elevated Ground Vibration, Air Blast and Flyrock

Review of Ground Vibration and Air Blast Standards

- ▼ Plotting Square-Root Scale Distance, Cube-Root Scale Distance
- ▼ Regression Analysis
- ▼ Spatial Relationships
- ▼ Accuracy of Measurements
- ▼ Blast Log Evaluation Program as a Guide
- ▼ Signature Blasts
- ▼ Frequency Determination

Structure Response

- ▼ Terminology of Houses
- ▼ Statistics of the Research
- ▼ Response Characteristics
- ▼ Strains
- ▼ Response Measurement
- ▼ Natural Frequency Determination

Field Exercise

- ▼ Seismic Array
- ▼ Structure Response

Damage Evaluation

- ▼ Pre-Blast and Post-Blast Surveys
- ▼ List of Available Tools and Techniques
- ▼ Not Blast Damage
- ▼ Environmental Causes of Damage
- ▼ Guide for Conducting Damage Assessments
- ▼ Vibration-Related Damages
- ▼ Documentation of Damage
- ▼ Situations When No Investigation Necessary

Public Relations/Customer Service

Safety Area and Warning Signals

Fumes

- ▼ Nitrogen Monoxide and Carbon Monoxide

Legal Issues

WHO SHOULD ATTEND: Regulatory personnel who have taken the Blasting and Inspection course within the last five years and/or whose principal job is Blasting Specialist.

COMMENTS: Students need to bring the following to class:

- ▶ Scientific calculator
- ▶ Engineering scale
- ▶ Seismograph, if available
- ▶ Problematic blast logs or seismic records
- ▶ Photos of alleged damages

Field Exercise: Hard hat and steel-toed boots are required.

National Technical Training Program: (202) 208-2769



Bonding Workshop: Administrative and Legal Aspects

This workshop provides information on how to evaluate and approve bonding instruments and liability insurance. **Duration: 3 days**

TOPICS COVERED

- ▼ Introduction
- ▼ Permittees' Form of Business
- ▼ Authority to Sign Documents
- ▼ Surety Bonds
- ▼ Letters of Credit
- ▼ Financial Status: Banks and Sureties
- ▼ Bankruptcy/Insolvency
- ▼ Certificates of Deposit
- ▼ Bond Forfeiture
- ▼ Document Control and Maintenance
- ▼ Public Liability Insurance
- ▼ Real Property Collateral Bonds
- ▼ Securities
- ▼ Self-Bonding

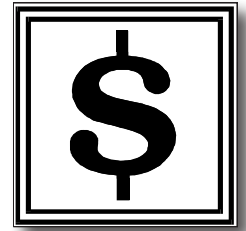
WHO SHOULD ATTEND: Bonding specialists and those individuals responsible for evaluating the validity and acceptability of bonds and insurance certificates and administration of bonding insurance programs; Managers who oversee bond reviews; and Attorneys involved in bond issue litigation.

COMMENTS: Students need to bring the following to class:

- ▶ 1–3 example bond forms from their state
- ▶ A copy of the bonding sections of their regulations and statute
- ▶ calculator

National Technical Training Program: (202) 208-2769

Bonding Workshop: Cost Estimation



This workshop provides participants with the information required to calculate reclamation bond amounts. Details are presented on use of OSM's "Handbook for Calculation of Reclamation Bond Amounts." **Duration: 3 days**

TOPICS COVERED

Introduction

- ▼ Introduction
- ▼ Regulatory Requirement
- ▼ Assumptions and Methodology in Handbook
- ▼ Major Steps for Estimating Bond Amount
- ▼ Phase Incremental and Cumulative Bonding
- ▼ Summary

Worst-Case Reclamation Scenario

Estimating Reclamation Costs

- ▼ Estimate Demolition Costs
- ▼ Determine Earthwork Materials Handling
- ▼ Plan
- ▼ Estimate Earthwork Quantities

Estimating Earthwork Costs - Example Calculations

- ▼ Dozer Hours
- ▼ Truck and Loader Hours

Estimating Earthwork Costs - Example Calculations

- ▼ Scraper Hours
- ▼ Total Earthwork Costs

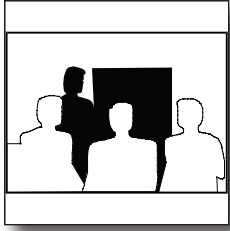
Estimating Reclamation Costs

- ▼ Revegetation Costs
- ▼ Other Costs
- ▼ Indirect Costs
- ▼ Total Costs

Calculation of Bond Amount for Example Mine Site

WHO SHOULD ATTEND: Technical specialists calculating bonds or reclamation costs. Federal and State personnel who are required to have a knowledge of the technical aspects of bond calculation.

National Technical Training Program: (202) 208-2769



Coalfield Communications: How to Get It Right!

The purpose of this course is to enhance the skills of staff that have a good deal of contact with the public. This course is an interactive forum which provides attendees with information to improve State, Tribal and Federal SMCRA Programs through effective communication by sharing successful and bad experiences. Topics covered include 1) Building trust through effective communication; 2) Conducting effective public meetings; 3) Pro-active and re-active interaction with news media and 4) Outreach. Class exercises are designed to maximize opportunities for student practice as communication skills are best learned through doing. **Duration: 3 days**

TOPICS COVERED

Building Trust Through Effective Communication

- ▼ Words, Tone and Body Language
- ▼ Improving Listening Skills
- ▼ Building an Effective Response

Conducting Effective Public Meetings

- ▼ Key Aspects of Public Meeting
- ▼ Meeting Nightmares
- ▼ Why Have Meetings?
- ▼ All Meetings Are Not the Same
- ▼ Planning Effective Meetings

Media Relations

- ▼ What Makes News?
- ▼ Laying the Groundwork
- ▼ Responding to Press Inquiries

Extending the Reach: Outreach Session

- ▼ How Outreach Can Help You
- ▼ Some Tools of the Trade
- ▼ Using the WEB
- ▼ How to be a Good Ambassador and Connecting with Communities
- ▼ Show and Tell

Crisis Communication Exercise

- ▼ True-to-Life Worst-Case Scenario
- ▼ Learning from Mistakes

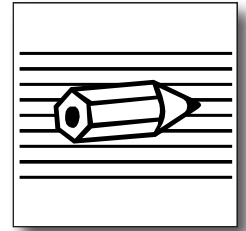
WHO SHOULD ATTEND: Staff who has frequent contact with the public and the news media.

COMMENTS: Students should be prepared to interact and participate in class discussions and exercises. Please bring examples of your office's outreach materials and personal experiences to share with the class.

National Technical Training Program: (202) 208-2769

Effective Writing

This course emphasizes using plain English as a way of expressing written ideas clearly. Participants learn how changes to style, organization, and layout can improve the quality of their documents. **Duration: 2 days**



TOPICS COVERED

Plain English Writing Skills

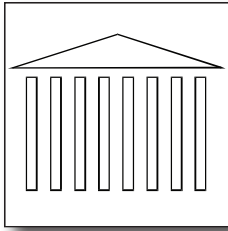
- ▼ Reader Analysis
- ▼ Writing Skills Assessment
- ▼ Plain Language
- ▼ Letters/Memos/E-mail
- ▼ Organization
- ▼ Active/Passive Voice
- ▼ Grammar/Punctuation
- ▼ Concise, Natural Writing
- ▼ Sentence/Paragraph Structure

- ▼ Writing Process
- ▼ Focusing Techniques
- ▼ Exercises

WHO SHOULD ATTEND: Anyone responsible for writing or reviewing inspection, administrative or technical documents.

COMMENTS: This course is normally held in participants' home offices.

National Technical Training Program: (202) 208-2769



Enforcement Procedures

This course provides an overview of the legal and practical aspects of the inspector's job, with a focus on preparing for and participating in administrative hearings. **Duration: 3 days**

TOPICS COVERED

Responsibilities of Inspectors

- ▼ Conducting Inspections
- ▼ Professional Attitudes/Judgment

Preparing for Inspections

- ▼ Permit Review
- ▼ Equipment/Supply Checklist
- ▼ Writing Reports

Enforcement Actions

- ▼ Inspection
- ▼ Administrative Review/Hearings
- ▼ Penalty Assessment

Alternative Enforcement Actions

- ▼ Individual Civil Penalty
- ▼ Injunction
- ▼ Criminal Action
- ▼ Permit Denial and the Applicator/Violator System

Potential Liability of Inspectors

- ▼ General Liability
- ▼ Sovereign/Governmental Immunity
- ▼ Conflict of Interest

Administrative & Judicial Proceedings

- ▼ Administrative Hearings
- ▼ Judicial Review
- ▼ Rules of Evidence
- ▼ Service
- ▼ Attorney-Inspector Relationship

Preparation of Notices of Violation and Cessation Orders

Administrative Law

Mock Inspection and Enforcement Action

- ▼ Development of Evidence
- ▼ Preparation of Testimony

Mock Administrative Proceeding

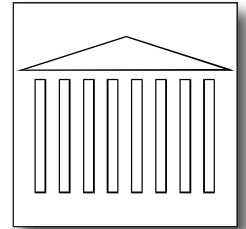
- ▼ Giving Testimony
- ▼ Interpreting Evidence
- ▼ Cross-examination
- ▼ Hearing Analysis

WHO SHOULD ATTEND: Inspectors and assessment specialists; permit reviewers, bonding specialists, program managers, new attorneys, and others who need an understanding of the enforcement program.

COMMENTS: At least six months on a regulatory program staff is recommended.

National Technical Training Program: (202) 208-2769

Enforcement Tools and Applications



This advanced course gives participants the opportunity to explore primary and alternative enforcement tools through SMCRA. The course includes a brief visit with the more familiar primary enforcement actions, such as citing violations and determining patterns of violation. The majority of the course is devoted to the next level of alternative enforcement topics and issues. The alternative enforcement section covers injunctions, criminal sanctions, individual civil penalties, and permit suspension or revocation. Related topics include early indicators of potential failure, bankruptcy, bond release, investigations, the Applicant/Violator System, and State statutes and regulations. Participants should be familiar with State and/or Federal enforcement issues and be prepared to participate in practical exercises. Advance notice of required materials will be given. **Duration: 2 days**

TOPICS COVERED

Setting the Stage

Existing Regulatory Provisions for Alternative Enforcement

- ▼ Civil Actions
- ▼ Individual Civil Penalty
- ▼ Pattern of Violations
- ▼ Criminal Sanctions

Efficient Primary Enforcement, the First Step of Alternative Enforcement

Debunking Some Myths and Common Beliefs

Early Indicators of Potential Failure

Investigations

- ▼ Investigation Questions
- ▼ Potential Sources of Information/Records

More Alternative Enforcement Actions

- ▼ False Information
- ▼ Permanent Permit Ineligibility
- ▼ Civil Action for Civil Penalties
- ▼ Permit Suspension or Revocation

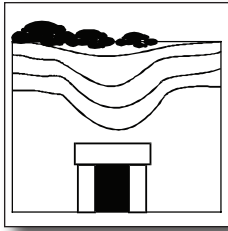
Developing a System

Practical Exercises

- ▼ Analysis of Cases
- ▼ Completing the Checklists
- ▼ Preparing Civil Complaints
- ▼ Administrative Decisions

WHO SHOULD ATTEND: Permitting staff, legal staff, and enforcement staff, program staff who coordinate alternative enforcement, and managers.

National Technical Training Program: (202) 208-2769



Erosion and Sediment Control

This course provides field inspectors and permit reviewers with a view of Theory and concepts related to soil erosion and sediment control processes. Special emphasis is given to identifying potential problems in the permit application and under field conditions. Remedial measures for soil erosion and sediment control are discussed. **Duration: 3 days**

TOPICS COVERED

General Introduction

- ▼ Course Objectives
- ▼ Solicits class-identified problems
 - (a) Written and given to instructors

Applicable Regulation and Performance Standards

- ▼ Example of Erosion Control Plan

Problems in the Permit Application

- ▼ Evaluating data submitted
- ▼ Field verification of field problems
- ▼ Students identify problems seen in field
- ▼ Data problems with Natural Resources
- ▼ Case studies (**good, bad, and ugly**)

Problems in the Field

- ▼ Tie permit data to field problems
- ▼ Structure suited to task
- ▼ Structure perform under various condition
- ▼ Always focus on “worst case scenario”

Concepts of Soil Erosion

- ▼ Define erosion and sedimentation
- ▼ Natural and man made factors affecting erosion
- ▼ Slope shape affect erosion
- ▼ Use of erosion equations
- ▼ Operations considerations to minimize erosion

Techniques, Structures and Products For Reducing Soil Erosion

- ▼ Commonly used erosion structures
- ▼ Commonly used erosion products

Final Contour, Suitable Rooting Medium and Final Grading

- ▼ Geomorphic Design
- ▼ Establish a productive rooting medium
- ▼ Role of compaction in runoff
- ▼ FRA (Forestry Reclamation Approach) role in sediment control

Concepts of Stream Flow, Velocity and Scour Components

- ▼ Characteristics of stream flow and how they change

Techniques, Structures and Products to Control Stream/Channel Erosion

- ▼ Use of vegetation
- ▼ Product applications; structures installation and maintenance

The Dynamics of Water and Sediment Movement in a Pond

- ▼ Water circulation in pond varies
- ▼ Sediment pond considerations

Sediment Control and Sediment Ponds

Best Management Practices (BMP)

Field Trip

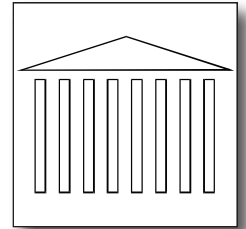
- ▼ Evaluation of erosion control practices, products and structures

WHO SHOULD ATTEND: Field inspectors, AML field personnel and permit reviewers

COMMENTS: Suggest having taken the Soil and Revegetation course prior to taking this course.

National Technical Training Program: (202) 208-2769

Evidence Preparation and Testimony



This course provides participants with detailed information concerning the legal aspects of evidence, the proper procedures for interviewing, specific evidence-development and management techniques, and practical experience in cross-examination testimony. **Duration: 3 days**

TOPICS COVERED

Evidence Management

- ▼ Graphic Evidence Techniques
- ▼ Photographic Evidence techniques
- ▼ Sketching
- ▼ Documents

Legal Overview of Evidence

- ▼ Types
- ▼ Legal Requirements

Hearsay

- ▼ Direct Examination
- ▼ Expert Testimony
- ▼ Cross-Examination
- ▼ Discovery

Interviewing

- ▼ Principles of Interviewing

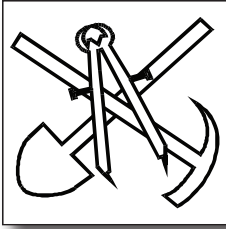
Testimony

- ▼ Presentation of Evidence
- ▼ Hearsay Rules
- ▼ Cross-Examination Testimony
- ▼ Attorney/Peer Critique

WHO SHOULD ATTEND: Inspectors, inspector supervisors and technical staff who wish to refine their skills in preparing evidence and giving expert testimony.

COMMENTS: Participants should have completed the **Enforcement Procedures** course or equivalent training prior to taking this course.

National Technical Training Program: (202) 208-2769



Excess Spoil Handling and Disposal in Steep-Slope Topography

This course provides participants with a basic understanding of approved spoil handling, backfilling, grading, compaction, and spoil-disposal practices with an emphasis on Eastern steep-slope mining and valley-fill construction. Typical design and construction practices are presented to provide an understanding of the relationship between permit requirements and on-the-ground performance. **Duration: 2½ days**

TOPICS COVERED

- ▼ Historical Perspective
- ▼ Geologic Principles
- ▼ Foundation Preparation and Internal Drainage Control
- ▼ Slope Stability
- ▼ Mining Methods
- ▼ Identification of Landslide Topography
- ▼ Earthwork Calculations
- ▼ Drainage Control
- ▼ Inspection of Slope Stability
- ▼ Permit Review and Interpretation
- ▼ Field Review
- ▼ Remedial Measures
- ▼ Field Instability & Erosion and Flooding
- ▼ Role of Vegetation Cover
 - ◇ *Forestry Reclamation Approach (FRA)*
 - ◇ *Low Compaction Grading*
 - ◇ *Loosening Compacted Soils*

WHO SHOULD ATTEND: Primarily inspectors, permitting specialists, and bonding specialists who need to learn more about Eastern steep-slope mining. Attendees should have at least six months surface mining experience.

COMMENTS: We recommend that participants have previously taken the **Applied Engineering Principles** course and either the **Permitting Hydrology** or **Surface and Groundwater Hydrology** courses.

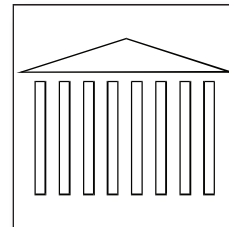
Students need to bring the following to class:

- ▶ Calculator

National Technical Training Program: (202) 208-2769

Expert Witness

This course provides participants with training on the scope of their role as a potential expert witness and gives practical experience in preparing for and presenting real-life expert testimony. **Duration: 3 days**



TOPICS COVERED

Legal Basis for Expert Testimony

Why Expert Witnesses?

- ▼ What is Special About Being an Expert Witness?

Experts' Qualifications and Curriculum Vitae (CVs)

- ▼ Who is an Expert Witness?
- ▼ Making of an Expert

Pretrial Activities of the Expert

- ▼ Being an Expert
- ▼ Pretrial Preparation and Discovery
- ▼ Testifying for the Other Side

Direct and Cross Examination of Experts

- ▼ Direct Examination and Expert Opinion
- ▼ Cross-Examination

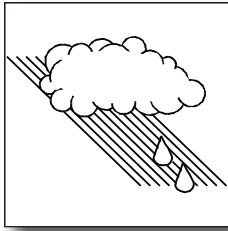
Being a "Good" Expert Witness

Mock Hearing

WHO SHOULD ATTEND: AML and regulatory technical personnel who may be called on to present expert testimony in the context of SMCRA civil litigation and administrative hearings.

COMMENTS: All participants are required to submit to the National Technical Training Office a report based on expert technical opinion that they have prepared in conjunction with work-related responsibilities and their CVs three weeks to the start the course. Participants should have completed the **Enforcement Procedures** and **Evidence Preparation and Testimony** courses or equivalent training before taking this course.

National Technical Training Program: (202) 208-2769



Forensic Hydrologic Investigation

This course provides training on how to conduct a hydrologic autopsy relating to mine problems including but not limited to: dewatering or contamination of aquifers, wells, streams, springs, pond/lakes, problems associated with increased amount of water from mine flooding, and other hydrologic problems associated with mining activities. **Duration: 3½ days**

TOPICS COVERED

A number of case studies will be given for the student to discuss and examine as to cause of problem, effect of the problem and what action can be taken to eliminate or minimize the problem. Each case will identify the tools, methods and other measure taken to arrive at a logical conclusion of the problem and the remediation.

Introduction and Philosophy

Impact Determination

Art of Interviewing

- ▼ Data Collection
 - ◇ *Data Collection and Compilation*
 - ◇ *Data Collection Exercise*
- ▼ Borehole Camera
 - ◇ *Borehole Video Camera System*
 - *Fracture Logging*
 - *Well Bore and Casing Integrity*
 - *Groundwater Information*
 - *Biological Activity*
- ▼ Mining Impacts
 - ◇ *Uses with Other Instruments and Equipment*
- ▼ Data Analysis
 - ◇ *Data Checking and Management*
 - ◇ *Overview of Statistical Methods*
 - ◇ *Display Techniques*
 - *Binomial and some Polynomial*
- ▼ Data Analysis Exercise 2

Blasting

- ▼ Impacts on Domestic Water Wells and Springs
- ▼ Case Studies (published and unpublished)
- ▼ Investigating Blasting Impacts

Report Preparation (Conclusions)

Preparation for Court

- ▼ Water Replacement
 - ◇ *Can Problem be fixed?*
 - ◇ *Treatment*
 - ◇ *Developing a New Source*
 - ◇ *Problem Remediation*

WHO SHOULD ATTEND: This course is geared mainly for geologists, hydrologists, and possibly inspectors who conduct hydrologic investigations on surface and groundwater problems related to coal mining activities.

National Technical Training Program: (202) 208-2769

Geology and Geochemistry of Acid-Forming Materials



This course is designed to provide participants with specific information, presented in a highly interactive manner, on analyzing and examining how geology and mineralogy influence water quality. A detailed discussion is presented on acid and alkaline weathering processes. Participants will be introduced to overburden drilling, sampling, and characterization. Participants will be given a variety of strategy and implementation lab methods and interpretations for overburden: static and leaching tests. Participants will use inquiry, problem-solving, and feedback methodologies for previous mining as a prediction tool, mine drainage prevention, and treatment techniques. **Duration: 4 Days**

TOPICS COVERED

Geological and Mineralogical Influences on Water Quality

- ▼ Examine and define geologic controls on the formation of pyrite and carbonate minerals.
- ▼ Assess geologic controls on mineralogy that influence mine drainage chemistry.

Acid and Alkaline Weathering Processes

- ▼ Interpret and illustrate chemistry of pyrite weathering.
- ▼ Interpret and illustrate chemistry of carbonate mineral weathering.
- ▼ Interpret and illustrate other weathering processes (silicates, cation exchange).

Sampling and Characterization of Overburden Materials

- ▼ Employ and calculate sampling strategy.
- ▼ Identify types of sampling and their advantages and disadvantages (air rotary, core, highwall).
- ▼ Class exercises (construction of theison polygons, etc.)

Laboratory Methods for Overburden Analysis

- ▼ Acid base accounting
- ▼ Leaching (kinetic) tests

Acid Drainage and Water Chemistry

- ▼ Fundamental principles and measurements
- ▼ Other ions common to mine drainage

Prevention Methods

- ▼ Special handling
- ▼ Water management

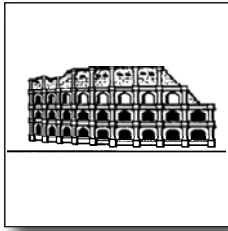
Geochemical Tests for Mine Drainage Prediction

Mitigation of Acid-Forming Materials

WHO SHOULD ATTEND: Permitting specialists, inspectors, and AML specialists. This course is designed for individuals who have had advanced high school chemistry or a basic college chemistry course. At least six months' experience on a regulatory or reclamation program staff is recommended.

Field Exercise: Hard hat, steel-toed boots, and safety glasses are required.

National Technical Training Program: (202) 208-2769



Historical and Archeological Resources

This course provides participants with information about the process for considering historic and archeological resources during the permitting process. **Duration: 3 days**

TOPICS COVERED

Course Overview and Laying the Groundwork

Overview of Laws and Regulations

Focusing on the National Historic Preservation Act (NHPA)

- ▼ Definitions
- ▼ Section 106 Overview
- ▼ Roles and Responsibilities

Section 106 Process

- ▼ Identify/Evaluate Historic Properties
- ▼ Assess and Resolve Adverse Effects
- ▼ Preservation Agreements

National Environmental Policy Act (NEPA) and Section 106

Emergencies and Discoveries

SMCRA Relationship to Section 106—State Program Considerations

Considerations of Burials and Cemeteries

- ▼ Surface Mining Control and Reclamation Act (SMCRA) Definition
- ▼ Native American Graves Protection and Repatriation Act (NAGPRA) Considerations
- ▼ State Laws and Regulations

Native American Consultations

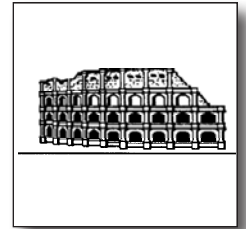
Other Legislation

WHO SHOULD ATTEND: AML, permitting and State program oversight staff, NEPA coordinators, program managers and inspectors whose jobs are directly related to this topic and who have not previously taken this course or those who took this course prior to 2000.

Field Exercise: Field clothes and appropriate shoes or boots are recommended.

National Technical Training Program: (202) 208-2769

Historical and Archeological Resources: Update and Refresher



This course provides participants who have taken the 3-day Historical and Archeological Resources course or this Refresher course from 2000 to 2007 with revised information on the application of the National Historic Preservation Act and the SMCRA historic preservation requirements in the AML and regulatory program. **Duration: 1 day**

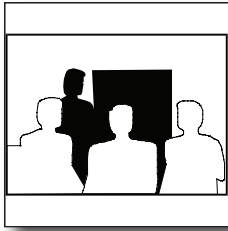
TOPICS COVERED

Preservation Legislation Updates

- ▼ 36 CFR Part 800
- ▼ Native American Graves Protection and Repatriation Act
- ▼ Executive Order 13007
- ▼ Other Regulatory Changes

WHO SHOULD ATTEND: AML, permitting and State program oversight staff, NEPA coordinators, program managers and inspectors who have taken the 3-day Historical and Archeological Resources course from 2000 to 2007 and whose jobs are directly related to this topic.

National Technical Training Program: (202) 208-2769



Instructor Training Course

This course provides subject matter experts/potential instructors with skills to develop lesson plans, training aids, and instructional material and to present training courses. Emphasis is placed on use of the training conference method of instruction. **Duration: 5 days**

TOPICS COVERED

Training Methods

- ▼ Lecture
- ▼ Demonstration
- ▼ Training Conference
- ▼ Practical Exercise

Instructor Lesson Plan Development

- ▼ Objectives
- ▼ Formats

Personal Skills

- ▼ Speech for Instructors
- ▼ Voice Development

Audiovisual Development

- ▼ Instructional Media
- ▼ Projection Media

Management Skills

- ▼ Psychology of Adult Education
- ▼ Classroom Management
- ▼ Learning Styles

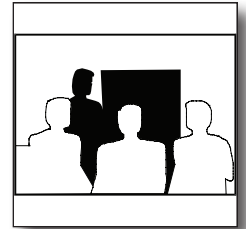
WHO SHOULD ATTEND: Potential instructors for the Office of Surface Mining Reclamation and Enforcement Technical Training and other programs.

COMMENTS: Practice presentations will be recorded on video tape and critiqued by peers and training leaders. Please note that all participants must reside at the training site. All technical training program instructors must complete this course.

National Technical Training Program: (202) 208-2769

Master Instructor Forum

This course provides experienced instructors with the opportunity to refresh their instructional skills and to learn best practices from each other. Emphasis is placed on differences in learning styles including whole brain thinking, training conference method skills and techniques, transfer of learning to students' jobs, and adding value to multi-media presentations. **Duration: 2½ days**



TOPICS COVERED

Hall of Fame

Overview

- ▼ Course Overview & Objectives
- ▼ Instructor Excellence
- ▼ Participant Introduction

Learning Styles

- ▼ Warmup Exercise
- ▼ Introduction to Learning Styles
- ▼ Whole Brain Thinking: A Tool for the Trainer
- ▼ Building Teacher Effectiveness

Toastmasters' Exercise

Making the Most of Multi-media

- ▼ Instructor is Always the Focus
- ▼ Use to Add Value
- ▼ How to Deal with Equipment Problems
- ▼ Creating an Effective Product
- ▼ PowerPoint Clinic (optional evening session)

Presentation Skills

- ▼ Presentation Video
- ▼ Training Conference Method
- ▼ Instructor Lesson Plan
- ▼ Classroom Management Tips
- ▼ Disruptive Instructors & Students
- ▼ Questioning Techniques
- ▼ Listening Skills

Transfer of Learning

- ▼ Presentation, Feedback, Practice
- ▼ Applying Knowledge & Skills on the Job
- ▼ Practical Exercise: Transfer Before, During, and After Training

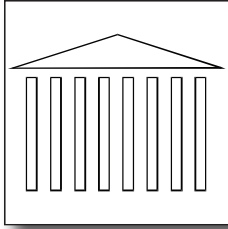
Closing

- ▼ Strong Start, Strong Finish
- ▼ Closing Exercise
- ▼ Closing

WHO SHOULD ATTEND: NTTP and TIPS instructors who attended the ITC course more than three years ago and who wish to hone their presentation skills.

COMMENTS: This course is by invitation only for experienced NTTP and TIPS instructors. Those interested in attending the course should contact their course manager.

National Technical Training Program: (202) 208-2769



NEPA Procedures

This course provides training for State and Federal staff involved in AML projects or Federal mine plan and Federal permit review in the procedures for complying with and drafting environmental documents required by the National Environmental Policy Act (NEPA) and other appropriate environmental laws, regulations, and executive orders. **Duration: 3 days**

TOPICS COVERED

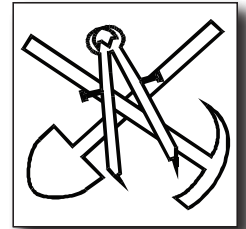
- ▼ NEPA History and Procedures
- ▼ Documents and Terminology
- ▼ Environmental Assessments (EA)/Categorical Exclusion (CX)
- ▼ The NEPA Process (AML and Regulatory Compliance)
- ▼ Public Involvement
- ▼ Resource Values
- ▼ Native American Values and Sacred Sites
- ▼ Hazardous Waste, Environmental Justice
- ▼ Consultation/Coordination

WHO SHOULD ATTEND: AML staff or permit review staff who have at least six months of experience with NEPA procedures or OSM/State regulatory staff who work directly with NEPA implementation on Federal permits.

COMMENTS: Please indicate on the nomination form if you are not an AML program employee and why you feel this course is necessary.

National Technical Training Program: (202) 208-2769

Passive Treatment: Theory and Application Workshop



This course provides information and exercises that are highly interactive and can be used to evaluate the application of passive treatment in clean streams, abandoned mine lands, and active mining projects; estimation of treatment costs; development of actual treatment designs; and assessment of existing treatment projects: **Duration: 3 days**

TOPICS COVERED

Introduction

- ▼ Overview of Course

Baseline Data Collection

- ▼ Site Assessment
- ▼ Characterization
- ▼ Water Quality Assessment

Passive Treatment Geochemistry

- ▼ Acidity
- ▼ Solubility
- ▼ Metals (Fe, Al, Mn)
- ▼ Passive Treatment Design and Decision Tree
- ▼ Passive Treatment of Net Acid Water
- ▼ Anoxic Limestone Drains
- ▼ Manganese Removal Beds

Anaerobic Bioreactors (VFP)

Wetlands (Sulfate Reducing System)

Vertical Flow Ponds (SAP)

Post Construction Monitoring

- ▼ Structural Inspection and Maintenance
- ▼ Water Sampling
- ▼ Data Interpretation

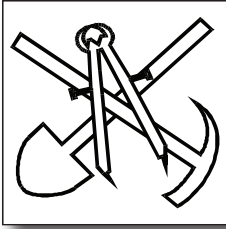
AMD Treat Demonstration

WHO SHOULD ATTEND: Permitting specialists, AML specialists, and inspectors

COMMENTS: We strongly recommend completion of the **Acid-forming Materials: Fundamentals and Applications** course.

Field Exercise: Hard hat, steel-toed boots, and safety glasses are required.

National Technical Training Program: (202) 208-2769



Permit Findings Workshop

This workshop is designed to assist regulatory personnel in preparing permit findings that are technically and legally sufficient and appropriately documented to be able to withstand legal challenge and public scrutiny. This course is intended to provide a process orientation and an awareness raising approach or methodology to permit findings. **Duration: 2 days**

TOPICS COVERED

Overview

- ▼ Course Objective

Purpose

- ▼ Importance of Written Findings

Legal Introduction

- ▼ Legal Aspects and Precedents

Findings List

- ▼ Various Federal Findings and Determinations, and Pertinent Regulatory Requirements

Review, Analysis and Conclusion

Process With Examples

- ▼ Process to Prepare Quality Written Findings

Workshop Discussion

- ▼ Hands-on Student Exercise in the Preparation and Presentation of Findings Using Various Hypothetical Situations

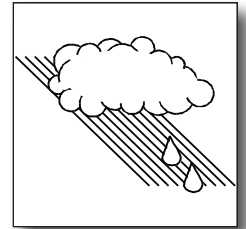
WHO SHOULD ATTEND: Regulatory staff and personnel involved in preparing permit findings.

COMMENTS: This course is not intended to be a technical review class nor “how to do it” training. Neither is it intended to replace information gathered in doing a probable hydrological consequences (PHC) determination or a cumulative hydrological impact assessment (CHIA) as taught in NTTP’s Permitting Hydrology course.

National Technical Training Program: (202) 208-2769

Permitting Hydrology

This course will emphasize reviewing probable hydrologic consequences determinations, defining material damage, and preparing cumulative hydrologic impact assessments. **Duration: 3½ days**



TOPICS COVERED

Permitting Hydrology Information

- ▼ Objectives of Course
- ▼ Permitting Process
- ▼ Hydrologic Cycle

Overburden/Geology Information

- ▼ Geologic Data Sources
- ▼ Structural Characteristics and Features

Backfill Materials Evaluation

- ▼ Baseline Information
- ▼ Acid/Alkaline Mine Drainage
- ▼ Acid-Base Accounting (Overburden)
- ▼ Overburden Sampling

Surface Water Information

- ▼ Baseline Information (Quality/Quantity)
- ▼ Data Collections
- ▼ Surface Water Quality Parameters (Analysis)
- ▼ Flow Measurement

Groundwater Information

- ▼ General Groundwater Terminology
- ▼ Groundwater Concepts
- ▼ Aquifer Properties
- ▼ Fracture System and Aquifer Properties/Testing
- ▼ Groundwater Monitoring: Some Basics
- ▼ Permit Review Basics

Hydrologic Baseline Data

- ▼ Data Checking
- ▼ Acid/Alkaline Mine Drainage, Oil & Gas Well Brine
- ▼ Quality Assurance/Quality Control
- ▼ Extraction Methods
- ▼ Water Sampling

EXERCISES

Probable Hydrologic Consequences (PHC)

- ▼ Principle Element of PHC Baseline Quality and Quantity
- ▼ Overburden Analysis
- ▼ Conceptual Models (Effecting Surface and Groundwater)
- ▼ Fly Ash/Biosolids for Reclamation
- ▼ Best Management Practices

Hydrologic Reclamation Plan (HRP)

- ▼ Acid/Alkaline Toxic Materials
- ▼ Alkaline Addition (Studies/Practices)
- ▼ Coal/Non-Coal Waste
- ▼ Erosion/Sediment Control (BMP)

Material Damage Standards

- ▼ Examples of Material Damage
- ▼ Material Damage, Hydrologic Impact (Minor, Major & Significant)

Cumulative Hydrologic Impact Assessment (CHIA)

- ▼ Anticipated Mining Example
- ▼ PHC vs CHIA?

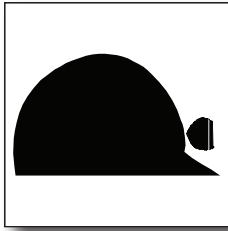
WHO SHOULD ATTEND: Hydrologists, hydrogeologists, engineers, and others who review hydro sections of permits and area involved in preparation of hydrologic assessments.

COMMENTS: This course does not present material applicable to inspectors of AML program activities and is not suitable for newly hired personnel.

Students need to bring the following to class:

- ▶ calculator

National Technical Training Program: (202) 208-2769



Principles of Inspection

This course provides training for new inspectors in methods and technologies applicable to the mining and reclamation process. The course teaches skills that are applicable to the inspection process, including the creation of documentation that supports authorities. **Duration: 3½ days**

TOPICS COVERED

- ▼ Documentation/Documentation Technology
- ▼ Maps/Interpretation
- ▼ Mine Plan Review
- ▼ Hydrologic Balance Protection
- ▼ Mining Methods
- ▼ Topsoil Handling/Prime Farmland
- ▼ Blasting and Inspection
- ▼ Revegetation Success
- ▼ Post Mining Land Use
- ▼ Conflict Resolution
- ▼ Mine Safety
- ▼ Inspection Reports
- ▼ Field Exercise at Mine Site

WHO SHOULD ATTEND: Inspectors who have up to three years of surface mining experience or those who interface with inspectors (e.g. auditors, program specialists, and support or bonding personnel)

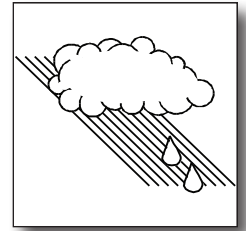
COMMENTS: Students need to bring the following to class:

- ▶ calculator

FIELD EXERCISE: Hard hat, steel-toed boots, and safety glasses are required.

National Technical Training Program: (202) 208-2769

Quantitative Hydrogeology



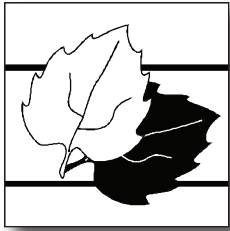
Review theories of aquifer characteristics and the practical utilization of hydrogeologic principles to understand and analyze groundwater movement. This course is intended to be a refresher on hydrogeology and to provide exposure to application of these principles in analysis and investigation of groundwater questions. The course will look at confined, unconfined, leaky, and fractured aquifers. Students will work on examples that apply these principles to coal mining and reclamation-related problems. **Duration 3½ days**

TOPICS COVERED

- ▼ Hydrologic Cycle
 - ◇ *Hydrologic Equations*
- ▼ Groundwater and Depositional Environment
 - ◇ *Conceptual Models*
- ▼ Litho and Hydrostratigraphic Units
- ▼ Ground Water Aquifer Types and Zones
 - ◇ *Darcy's Theory (Law)*
 - ◇ *Definitions, Equations, Assumptions, Applications*
- ▼ Problems
 - ◇ *Determine Water Flow Direction & Hydraulic Gradient*
 - ◇ *Hydraulic Gradient and Contouring*
 - ◇ *Potentiometric Surface*
- ▼ Ground Water Storage Relationships
- ▼ Leaky Confined Aquifers
 - ◇ *Examples*
- ▼ Unconfined Flow Systems (Theory & Data Collection)
- ▼ Quantitative Hydrology (Fracture Flow)
 - ◇ *Fracture Flow Theory (Micro → Regional Scale)*
 - ◇ *Fracture Flow Approaches*
 - ◇ *REV Concepts*
 - ◇ *Reynolds Number*
- ▼ Data Application
 - ◇ *Hydrogeology in the Arid Southwest (Regional Example)*
 - ◇ *Conceptual Models*
 - ◇ *Geology*
 - ◇ *Hydrogeology*
 - ◇ *Hydro Concerns*
 - ◇ *Hydrologic Systems*
- ▼ Southwest Region Mine Example
- ▼ Underground Mine Pool Characteristics
 - ◇ *Quantitative Hydrology—Mine Pools*
 - ◇ *Subsidence Theory (Impacts)*
 - ◇ *Quantitative Hydrology—Recharge Rates*
- ▼ Longwall Mining Impacts to Aquifers—Case Studies

WHO SHOULD ATTEND: Regulatory or AML scientists with degrees or college credit in hydrology or current experience in groundwater hydrology, with six months to one year of experience with SMCRA.

National Technical Training Program: (202) 208-2769



Soils and Revegetation

This course provides information that will help participants recognize the existence of soil or plant problems. This course does not apply to areas to be returned to forest land. The course will focus on soils and vegetation in four phases of mining and reclamation including pre-mining inventory, planning, operational considerations, and reclamation. **Duration: 4 days**

TOPICS COVERED

Describing Soil

- ▼ Soil Characteristics

Soil Survey

- ▼ SCS Manual (Components/Definitions)
- ▼ Profile (Monolith) (If Available)

Soil Sampling and Analysis

- ▼ Importance of Sampling and Testing Methods
- ▼ Interpretation of Soil Test
- ▼ Physical Properties of Soil

Plant Identification

- ▼ Vegetative Life Forms
- ▼ A Strategy for Plant Identification
- ▼ Problems in Plant Identification
- ▼ Identifying Characteristics in Reclamation Plant

Evaluating Vegetation Success

- ▼ Purpose/Methods/Parameters

Soil Environment

- ▼ Plant-Soil Environment
- ▼ Soil Environment
- ▼ Impacts of Mining

Practices to Enhance Forest Development

- ▼ Natural Changes in Plant Community

Species Selection

- ▼ Criteria for Species Selection
 - ◇ *Revegetation Goals*
 - ◇ *Site Conditions*
 - ◇ *Plant Adaptations and Availability*

Soil Handling

- ▼ Soil Removal/Storage
- ▼ Soil Reconstruction
- ▼ Prime Farmland Soils
- ▼ Erosion Control

Soil Amendments

- ▼ Soil Fertility/Liming
- ▼ Fertilizer Rate Exercise

Seedbed Preparation

- ▼ Root Zone Penetration
- ▼ Seedbed Preparation
- ▼ Seedling/Mulching
- ▼ Vegetation Management

Woody Plant Establishment

- ▼ Woody Species/Reclamation
- ▼ Methods of Establishment
- ▼ Assuring a Successful Planting
- ▼ Problems in Planting Woody Plants

Vegetation Success (Field Exercise)

WHO SHOULD ATTEND: Inspectors, program and AML staff.

COMMENTS: Students need to bring the following to class:

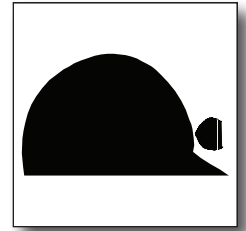
- ▶ calculator

Field Exercise: Hard hat, steel-toed boots, and safety glasses are required.

National Technical Training Program: (202) 208-2769

Subsidence

This course provides participants with information to enhance their scientific knowledge and technical skills in predicting subsidence, identifying methods to protect against or minimize damages caused by subsidence, and understanding the surface effects and impacts caused by longwall and room-and-pillar underground mining methods. **Duration: 3 days**



TOPICS COVERED

Introduction

- ▼ Overview of Course
- ▼ Statistics on Longwall Numbers and Production
- ▼ Longwall Mining
- ▼ Room-and-Pillar Mining with Retreat Mining

Mechanics of Subsidence

- ▼ Mechanics of Overburden Movement
- ▼ Zones of Movement
- ▼ Factors Controlling the Height of Caved and Fractured Zones
- ▼ Planned Versus Unplanned Subsidence
- ▼ Relationship Between Subsidence and Percent Extraction
- ▼ Longitudinal and Transverse Profile

Parameters that Characterize Subsidence

- ▼ Angle of Draw
- ▼ Angle of Break
- ▼ Angle of Critical Deformation
- ▼ Inflection Point
- ▼ Radius (r) and Angle (B) of Major Influence
- ▼ Maximum Subsidence and Subsidence Factor
- ▼ Types of Subsidence Troughs (critical, sub-critical, sup-critical)
- ▼ Relationship Between Subsidence Factor and Percent Hardrock
- ▼ Relationship Between Subsidence Factor and Width/Depth Ratio
- ▼ Multiple Panels
- ▼ Time Effects
- ▼ Dynamic Surface Movement
- ▼ Other

Subsidence Prediction Methods

- ▼ Subsidence Development Prediction System (SDPS)
- ▼ Comprehensive and Integrated Subsidence Prediction Model (CISPM)
- ▼ National Coal Board Method (NCB)

- ▼ Penn State University (PSU) Model
- ▼ Beulah Model
- ▼ Other Models

Requirement of Energy Policy Act (EPACT) 92

Surface Structural Damage/Prediction

Damage To Renewable Resources

Damage To Water and Aquifers

Theories on Mitigation Measures

Methods To Minimize or Prevent Subsidence Damage

- ▼ How to Conduct Subsidence Damage Investigations
- ▼ Engineering Tools Available for Documentations

Subsidence Monitoring—Layout of Monuments

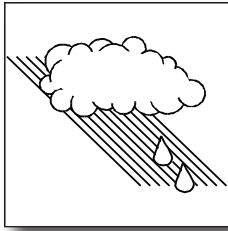
Design of Mine Pillars

- ▼ Pillar Load
- ▼ Pillar Strength Using Four Formulas Applied in the United States
- ▼ Pillar Strength After Flooding
- ▼ Pillar Design for Multi-Seam Conditions
- ▼ Abutment Pressure During Retreat Mining
- ▼ Pillar Strength for Weak Floor/Roof
- ▼ Pillar Strength for New Mines and Abandoned Mines
- ▼ Designing Pillars Using SDPS

Case Studies and Problem Exercises

WHO SHOULD ATTEND: Mining engineers, geologists, hydrogeologists, mine inspectors, mine permit reviewers, regulatory personnel, program managers, regulatory personnel, program managers, and attorneys dealing with subsidence cases.

National Technical Training Program: (202) 208-2769



Surface and Groundwater Hydrology

This course provides participants with information on the basic effects of surface coal mine operations on surface and groundwater hydrology. **Duration: 3½ days**

TOPICS COVERED

Introduction and Basic Concepts

- ▼ Introduction
 - ◇ *News Articles (Water Shortage)*
 - ◇ *Water in the Forest (Video)*
 - ◇ *Movement of Water in Nature*
 - ◇ *Hydrographs (Examples & Exercise)*

Control of Water and Sediment

- ▼ Overview
- ▼ Sediment Ponds
 - ◇ *Work as a Sediment Control*
 - ◇ *Pond Design Factors*

Slides Presentation

- ▼ Surface Water Example

Groundwater Hydrology

- ▼ Groundwater System
 - ◇ *Movement of Groundwater*
 - ◇ *Groundwater Chemistry*
 - ◇ *Class Problem*

Effect of Mining on Groundwater

- ▼ Physical Effects of Mining
- ▼ Conceptual Models

Example Case: Mining Effect On Groundwater

- ▼ Actual Case

Acid Mine Drainage

- ▼ AMD Process
 - ◇ *Oxygen Pathway of AMD*
 - ◇ *AMD Ferric Iron Pathway*
- ▼ AMD Prevention
- ▼ AMD Treatment
- ▼ Passive Treatment Systems

Slides/Equipment Demo

Surface/Groundwater Monitoring

- ▼ Objectives
- ▼ Baseline Data (pre, active & post)
- ▼ Representative Samples
- ▼ Measuring Techniques
- ▼ Groundwater Monitoring (Wells)
- ▼ Surface Water Measurements
- ▼ Flow Quantity Measurements
- ▼ Monitoring Wells (Installation)

Data Interpretation (QA/QC)

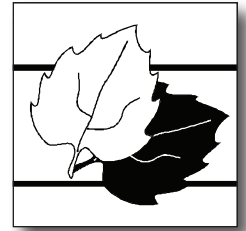
- ▼ Introduction
- ▼ Review of Sample Data
- ▼ Complete Analysis
- ▼ Quality Assurance (QA) Quality Control (QC)
- ▼ Graphical Methods of Sample Analysis
- ▼ Class Problem

WHO SHOULD ATTEND: Inspectors, permit bonding, assessment and AML program specialists, others who may need a basic course. Recommend six months minimum experience on the job.

Field Exercise: Hard hat, steel-toed boots and safety glasses are required.

National Technical Training Program: (202) 208-2769

SMCRA: Permitting and the Endangered Species Act: Implementation of the 1996 Biological Opinion



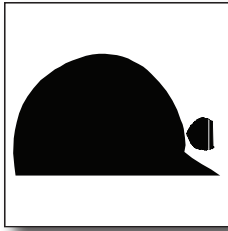
This course provides participants with a fuller understanding of the 1996 Biological Opinion and Conference Report (BO) issued to the Office of Surface Mining by the U.S. Fish and Wildlife Service on surface coal mining and reclamation operations, the underlying statutory and regulatory requirements, and how the BO is intended to operate. **Duration: 2 Days**

TOPICS COVERED

- ▼ Introduction/Course Goals
- ▼ Primer on SMCRA and the ESA
- ▼ Overview of the Biological Opinion
- ▼ Surface Coal Mining Effects on Endangered Species
- ▼ Endangered Species Acts
- ▼ Stepwise Approach to the 1996 Biological Opinion—Part 1
 - ◇ *Questions and Answer Session with discussion*
- ▼ Stepwise Approach to the 1996 Biological Opinion—Part 2
- ▼ Threatened and Endangered Finding
- ▼ Discussion on the Implementation of the 1996 Biological Opinion
- ▼ How the 1996 Biological Opinion Is Being Implemented in Different States
- ▼ Final Exercises

WHO SHOULD ATTEND: State and Federal program staff, permitting specialists and inspectors, and State and Federal personnel responsible for commenting on the fish and wildlife aspects of SMCRA permits.

National Technical Training Program: (202) 208-2769



Underground Mining Technology

This course provides basic information on the types of underground coal mining and on how to identify the surface effects of underground mining.

Duration: 4 days

TOPICS COVERED

Introduction to Underground Mining

- ▼ Course Overview and Evaluation
 - ◇ *Coal Facts and Geology*
- ▼ Underground Mining Methods
 - ◇ *Access: Drift, Slope and Shaft*
 - ◇ *Room-and-Pillar Mining*
 - ◇ *Mining System/Development Mining*
 - ◇ *Auger and Highwall Mining*
 - ◇ *Longwall Mining*
 - ◇ *Mining Terms*
 - ◇ *Layout*
 - ◇ *Logistics*

Introduction to Mine Maps

- ▼ Topographic Map Review
 - ◇ *Underground Mine Maps*
 - ◇ *Topographic/Underground Map Correlation*

Surface Effects of Underground Mining

- ▼ Environmental Effects and Controls
 - ◇ *Subsidence*
 - ◇ *Hydrology*
 - ◇ *Mine Fires*
 - ◇ *Mine Gases*
 - ◇ *Coal Waste Handling*

Field Exercise

- ▼ Underground Mine Features
 - ◇ *Mine Development*
 - ◇ *Mine Equipment Operation*
 - ◇ *Ventilation and Roof Control Systems*
 - ◇ *Transport System*
 - ◇ *Power Supply*
 - ◇ *Water Handling System*
- ▼ Surface Features
 - ◇ *Subsidence*
 - ◇ *Coal Preparation*
 - ◇ *Water Treatment (Acid-Mine Drainage)*
 - ◇ *Waste Handling*

WHO SHOULD ATTEND: Inspectors, permit, bonding, assessment, and AML program specialists; program managers; and other staff who may need a basic or refresher course. At least six months experience on a program staff is recommended.

COMMENTS: All participants must complete the underground exercise unless a waiver is granted prior to the start of the course session. A request for a waiver with appropriate justification may be submitted in writing to the Chief, National Technical Training Program.

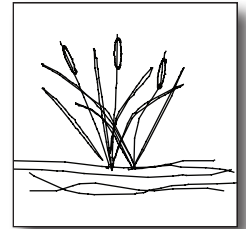
FIELD EXERCISE: Hard hat with light mount, steel-toed boots, safety glasses, coveralls, leg bands, and miner's belt are required.

National Technical Training Program: (202) 208-2769

Wetlands Awareness

This course familiarizes regulatory and AML field personnel with identification of wetlands, along with requirements and procedures for wetland protection.

Duration: 2½ days



TOPICS COVERED

Different Kinds of Wetlands

- ▼ Wetland Classification

Environmental Functions and Values

- ▼ Hydrologic Balance
- ▼ Water Quality
- ▼ Fish and Wildlife Habitat
- ▼ Renewable Resources

Jurisdictional Wetlands

- ▼ Definition
- ▼ Technical Criteria
- ▼ Delineation Procedures

Techniques for Recognizing Wetlands

- ▼ Hydrophytic Vegetation
- ▼ Wetland Hydrology Indicators
- ▼ Hydric Soils Identification

U.S. Army Corps of Engineers

Section 404 of the Clean Water Act

- ▼ Coordination Procedures
- ▼ Permitting Requirements

Demonstrations and Practical Exercises

- ▼ Practice Using Delineation Manual
- ▼ Field Application of Recognition Techniques

WHO SHOULD ATTEND: This is a basic course for AML and regulatory field personnel with a natural sciences background who are involved in mine-site inspection and permit review. No previous knowledge of wetlands is necessary.

COMMENTS: This course does not cover acid-mine drainage treatment systems.

Students need to bring the following to class:

- ▶ calculator

Field Exercise: Field boots and rain gear are required.

National Technical Training Program: (202) 208-2769

**TECHNICAL
INNOVATION AND
PROFESSIONAL
SERVICES
(TIPS) OFFERINGS**

**TECHNICAL INNOVATION AND PROFESSIONAL SERVICES (TIPS)
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(303) 293-5057
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E-mail: jvillanueva@osmre.gov

TIPS TRAINING PROGRAM TEAM LEADER: Karyn Evans

(303) 293-5067

Fax No: (303) 293-5058

E-mail: kevans@osmre.gov

COURSE MANAGER: David Agnor

(614) 416-2238, ext. 112

Fax No: (614) 416-2248

E-mail: dagnor@osmre.gov

- Introduction to ArcGIS for Mining and Reclamation

COURSE MANAGER: Debbie Dale

(618) 463-6463, ext. 5149

Fax No: (618) 463-6470

E-mail: ddale@osmre.gov

- Testing and Analysis of Aquifer Characteristics with AQTESOLV™

COURSE MANAGER: Ken Eltschlager

(412) 937-2169

Fax No: (412) 937-3012

E-mail: keltschl@osmre.gov

- Blasting Log Evaluation Program
- GPS Garmin ETrex Vista C

COURSE MANAGER: Janine Ferarese

(303) 293-5068

Fax No: (303) 293-5058

E-mail: jferarese@osmre.gov

- E-Tools for Permitting & Reclamation

COURSE MANAGER: Lou Hamm

(303) 293-5061

Fax No: (303) 293-5058

E-mail: lhamm@osmre.gov

- Galena Slope Stability Analysis

COURSE MANAGER: Kwang (Min) Kim

(618) 463-6463, ext. 5151

Fax No: (618) 463-6470

E-mail: kkim@osmre.gov

- ArcPAD 7: Mobile GIS for Reclamation Mapping and Analysis

COURSE MANAGER: Jeff King

(814) 472-1900

Fax No: (814) 472-1839

E-mail: jeking@state.pa.us

- Carlson Mining for Permitting and Reclamation (SurvCADD)
- Advanced Topics for Reclamation and Permitting Using SurvCADD

COURSE MANAGER: Brent Means

(717) 782-4080, ext. 18

Fax No: (717) 782-3771

E-mail: bmeans@osmre.gov

- AMDTreat

COURSE MANAGER: Tom Mastrorocco

(412) 937-2939

Fax No: (412) 937-3012

E-mail: tmastror@osmre.gov

- ArcGIS Spatial Analyst: for Mining and Reclamation

COURSE MANAGER: Doug Mullins

(276) 523-8255

Fax No: (276) 523-8141

E-mail: doug.mullins@dmme.virginia.gov

- AutoCAD Map for Permitting and Reclamation
- Underground and Surface Mine Mapping with Autodesk Raster Design and Autodesk Map

COURSE MANAGER: Bob Postle

(303) 293-5041

Fax No: (303) 293-5032

E-mail: bpostle@osmre.gov

- Analyzing Environmental Monitoring Data Using StatGraphics Plus

COURSE MANAGER: Danny Rahnema

(865) 545-4103, x167

Fax No: (865) 545-4111

E-mail: drahnema@osmre.gov

- SEDCAD for Mining, Permitting and Reclamation

COURSE MANAGER: Stefanie Self
(618) 463-6463 x5128
Fax No: (618) 463-6470
E-mail: sself@osmre.gov

- AutoCAD Fundamentals for Permitting and Reclamation
- Advanced AutoCAD for Permitting and Reclamation

COURSE MANAGER: Lois Uranowski
(412) 937-2805
Fax No: (412) 937-3012
E-mail: luranowsk@osmre.gov

- SDPS: Surface Deformation Prediction System

COURSE MANAGER: Robert Welsh
(303) 293-5080
Fax No: (303) 293-5058
E-mail: rwelsh@osmre.gov

- GeoExplorer 3 GPS and PF Office: Advanced GPS Mapping for Reclamation
- Trimble GeoXT, TerraSync and PF Office: Mobile Computing for Reclamation

COURSE MANAGER: Alan Wilhelm
(303) 293-5081
Fax No: (303) 293-5058
E-mail: awilhelm@osmre.gov

- Underground Mine Mapping with GIS

COURSE MANAGER: Shellie Willoughby
(405) 521-4828
Fax No: (405) 521-6686
E-mail: shellie.willoughby@conservation.ok.gov

- Image Analysis for ArcGIS

COURSE MANAGER: Bill Winters
(412) 937-2105
Fax No: (412) 937-3012
E-mail: bwinters@osmre.gov

- Modeling and Analysis with Groundwater Vistas

COURSE MANAGER: Mychal Yellowman
(303) 293-5049
Fax No: (303) 293-5032
E-mail: myellowm@osmre.gov

- Carlson's Natural Regrade for Permitting and Reclamation

TIPS Appalachian Region Training Coordinators:

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LaVonne Zibrida
(618) 463-6463, ext. 5116
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E-mail: lzibrida@osmre.gov

**TECHNICAL INNOVATION AND PROFESSIONAL SERVICES (TIPS)
STEERING COMMITTEE**

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Western Region
Denver, Colorado
(303) 292-5001
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Dave Berry, CO (303) 866-4938 Fax No: (303) 866-8106 E-mail: david.berry@state.co.us	Western States (WEIB)

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Sarah Donnelly, DC (202) 208-2826 Fax. No. (202) 219-3111 E-mail: sdonnelly@osme.gov	OSM National Technical Training Program (NTTP)
Billie Clark, Denver, CO (303) 293-5055 Fax No: (303) 293-5058 E-mail: bclark@osmre.gov	TIPS Manager

TECHNICAL INNOVATION AND PROFESSIONAL SERVICES (TIPS) TRAINING SCHEDULING AND NOMINATION PROCEDURES

Students are scheduled to attend TIPS Training courses according to the following:

1. ANNUAL NEEDS SURVEY. Each spring the National Technical Training Program (NTTP) distributes the Needs Survey for TIPS courses for the following fiscal year to all State, Tribal and OSM technical training contacts.

Within 30 days of receipt of the survey, State, Tribal and OSM training contacts advise NTTP of their offices' needs for the upcoming year.

2. SPACE ALLOCATION. TIPS Training representatives review the Needs Survey results and assign slots to State, Tribal and OSM offices for each course sessions. In making this assignment, the following factors are considered:

- Identified Priority 1 training needs, taking into consideration Priority 2 needs as well
- Student location of where the identified need is
- Distribution of classes between three Regional training centers
- Size of the training room in relation to the identified need
- Number of prior year course sessions and location of classes held previously

Whenever possible, TIPS representatives minimize conflicts by:

- scheduling course sessions with a field component during the spring/fall timeframe;
- not scheduling course sessions during holiday weeks;
- not scheduling course sessions when known meetings and events are taking place;
- not scheduling course sessions back-to-back in a Regional training center; and,
- not scheduling course sessions to compete with other TIPS offerings

Space allocations and the course calendars are distributed to State, Tribal, and Federal training contacts at the beginning of the Federal fiscal year.

3. COURSE ENROLLMENT. Course enrollment for all TIPS course sessions are to be made via DOI Learn, OSM's Learning Management System. State and Tribal training contacts submit course enrollment forms for employees in their office, and OSM employees are responsible for logging into DOI Learn and applying for course sessions.

Course enrollment for TIPS course sessions must be entered into DOI Learn by the end of the calendar year. In January, if slots are not "claimed" via course enrollment in DOI Learn, remaining slots in TIPS classes are released to anyone with an interest/ need to attend TIPS classes. An e-mail is sent to State, Tribal, and OSM training contacts advising them of classes with slot openings; training contacts share this information with employees in their office. Available slots in TIPS classes are posted on the TIPS Training website <http://www.tips.osmre.gov/training/> and distributed monthly via e-mail to State, Tribal, and OSM training contacts with a request to share with employees in their office.

First consideration for space in course sessions is given to State, Tribal, and Federal regulatory and reclamation program participants. Space will be made available to personnel from other governmental agencies, industry, and other interested organizations on a space-available basis, usually no earlier than 30 days before the start of a course session.

All nominees are notified of acceptance for a course session six to eight weeks prior to the session date. Please notify the TIPS Western Region training program coordinator as early as possible of any cancellations. If insufficient nominations are received, the course session will be canceled and nominees will be notified.

Field Exercises: All those attending Global Positioning System (GPS) courses must bring outdoor-clothing and shoes and be prepared for inclement weather. GPS outdoor sessions will be held rain or shine.

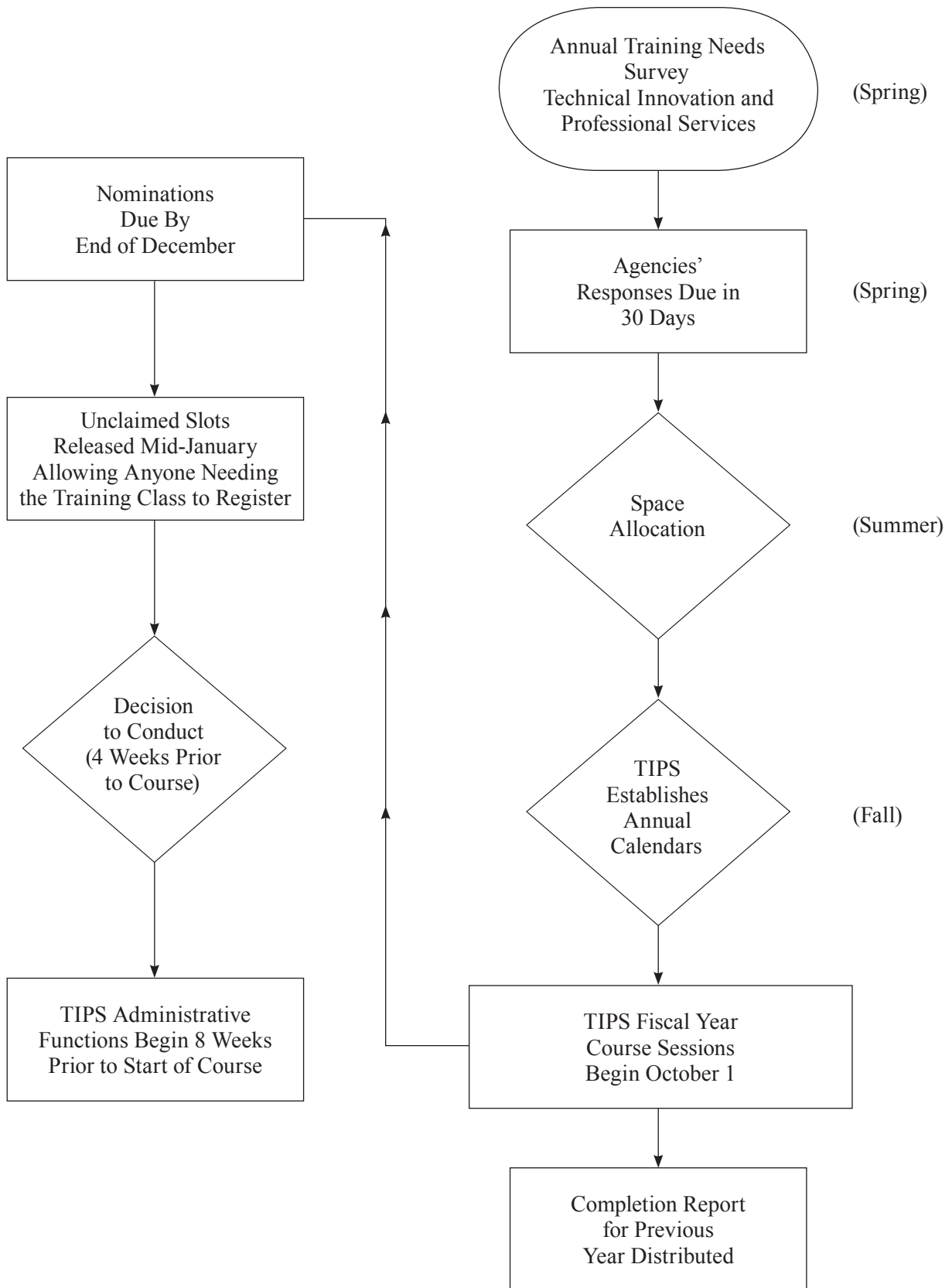


Figure 1. Technical Innovation and Professional Services (TIPS) Training Nomination Procedure

TECHNICAL INNOVATION AND PROFESSIONAL SERVICES (TIPS) OFFERINGS

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Advanced AutoCAD for Permitting & Reclamation

This course will teach students advanced topics in AutoCAD that have not been covered in the introductory course AutoCAD Fundamentals for Permitting and Reclamation. Students will round out their AutoCAD skills and learn new tools and techniques that will increase their drawing quality, efficiency, and productivity.

Duration: 3 days

Course Code: EAA



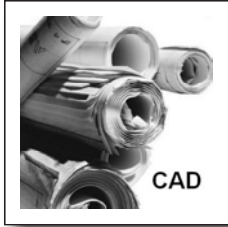
TOPICS COVERED

- ▼ Discuss advanced layer management and customized user interface
- ▼ Define custom linetypes
- ▼ Examine dimensioning and external references
- ▼ Identify intelligent blocks
- ▼ Practice advanced attribute editing
- ▼ Examine 3D viewing
- ▼ Review paper space, plotting and sheet sets

COURSE PRE-REQUISITES: Prospective students should have a working knowledge of AutoCAD or they should have taken the introductory course AutoCAD Fundamentals for Permitting and Reclamation. Basic AutoCAD skills will not be covered in this course.
Class size is limited to 12–17 students, depending on location.



Advanced Carlson Mining for Permitting & Reclamation (SurvCADD)



This course will teach practicing Carlson Mining users advanced topics that have not been covered in the introductory Carlson Mining for Permitting and Reclamation. Students will round out their skills and learn new tools and techniques that will increase their design quality, efficiency, and productivity.

Duration: 3 days
Course Code: EAS

TOPICS COVERED

- ▼ Define and examine project planning and data gathering
- ▼ Review Tsunami Data Collection and LIDAR survey data
- ▼ Discuss data quality
- ▼ Review break lines, contouring/triangulation
- ▼ Identify and create 3D designs and 3D polylines (building a wireframe), templates, cross sections,
- ▼ Examine grid sizes, grid manipulation and grid display cut and fill volumes
- ▼ Analyze cost estimation
- ▼ Review plotting and paper space
- ▼ Discuss mobile computing concepts

COURSE PRE-REQUISITES: Prospective students should have attended Carlson Mining for Permitting and Reclamation or have a working knowledge of AutoCAD. Basic AutoCAD skills will not be covered in this course. **Class size is limited to 12–17 students, depending on location.**

AMD Treat: Mine Drainage Treatment Cost Calculation Software



The program offers users a method to predict and model water treatment costs for mine drainage problems. It also allows for the determination of capital cost associated with treatment of polluted mine drainage. AMDTreat provides many different treatment options both for passive and active treatment systems. Over 500 variables are available to the user to customize the costing routines for site-specific conditions.

Duration: 3 days
Course Code: EAT

TOPICS COVERED

The objective of this course is to provide students with a basic understanding of treatment methods, strategies, and cost-estimation procedures using the AMDTreat software.

Application Introduction

- ▼ Introduction to the main screens of AMDTreat.
- ▼ Introduction to AMDTreat “Expert” help.
- ▼ Introduction to the AMDTreat financial and scientific tools.

Chemistry of AMD

- ▼ Introduction to the chemistry of AMD as it applies to AMDTreat.
- ▼ Introduction to the chemistry of acidity.
- ▼ Introduction to equilibrium and kinetic chemistry of iron, manganese and magnesium.
- ▼ Introduction to the acidity and sludge titrations for use in cost modeling with AMDTreat.

Cost Modeling with AMDTreat

- ▼ Forward cost modeling
- ▼ Reverse cost modeling
- ▼ What-If cost modeling

Introduction to Passive Treatment

- ▼ Introduction to passive treatment systems as they are applied in AMDTreat modules.
- ▼ Discussion of the economic and physical attributes of each treatment system as they relate to estimating costs.

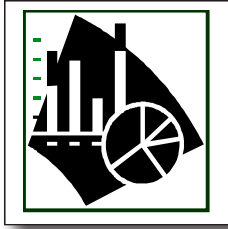
Introduction to the Chemical Treatment

- ▼ Introduction to chemical treatment systems as they are applied in AMDTreat modules.
- ▼ Discussion of the economic and physical attributes of each treatment system as they relate to estimating costs

COURSE PRE-REQUISITES: Familiarity with active and passive AMD treatment systems and treatment cost bonding estimation are desirable. **Class size is limited to 12–17 students, depending on location.**



Analyzing Environmental Monitoring Data Using Statgraphics PLUS



StatGraphics Plus for Windows software is an easy-to-use statistical analysis tool that combines a broad range of statistical procedures with interactive graphics to provide an integrated analytical environment. The visual presentation of the statistical analyses is well suited for explanation of actions, decisions or concerns to the public and decision makers. The course emphasizes preparation, analysis, and graphical presentation of water quality, water quantity, vegetation and revegetation, blasting, soils and overburden quality and suitability, and other environmental applications.

Duration: 3 days

Course Code: STA

TOPICS COVERED

Introduction to STATGRAPHICS

- ▼ Examples of SMCRA-Related Statistical Applications
- ▼ Software Organization
- ▼ Windows Environment

Data Management

- ▼ Importing Files
- ▼ Reading Files
- ▼ Creating Files
- ▼ Creating Variables in New Files
- ▼ Entering the Data
- ▼ Data storage
- ▼ Updating and Recoding Data
- ▼ Exporting Files

Data Analysis

- ▼ Descriptive Methods
- ▼ Hypothesis Tests
- ▼ Sample Size Determinations
- ▼ ANOVA
- ▼ Times Series
- ▼ Tests for Normality
- ▼ Regression Analysis

Graphical Data Presentation

- ▼ XY Plots
- ▼ XYZ Plots
- ▼ Histograms
- ▼ Box and Whiskers Plots
- ▼ Regression Lines
- ▼ Forecasting

Customized Statistical Graphics

- ▼ Editing, Printing, and Saving Graphics
- ▼ Exporting Analyses and Graphics
- ▼ Creating Multiple Slides
- ▼ Statgallery Features

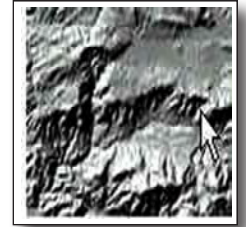
Case Studies and Exercises

Individual Assistance On Special Problems

WHO SHOULD ATTEND: Regulatory or AML scientists with college credit in statistics or current experience in statistics who analyze hydrologic, geochemical, vegetative, blasting, geotechnical, or other technical data.

COURSE PRE-REQUISITES: None. **Class size is limited to 12–17 students, depending on location.**

ARCGIS Spatial Analyst: For Mining and Reclamation



This course explores how the ArcGIS Spatial Analyst extension uses raster and vector data in an integrated environment. This course teaches the basic raster concepts and shows how to create, run and edit spatial models. It focuses on problems that are best solved in a raster environment such as Approximate Original Contour topographic analysis, view-shed modeling, and reclaimed slopes hydrologic analysis.

Duration: 3 days

Course Code: GSA

TOPICS COVERED

Basic Concepts

- ▼ Raster Concepts
- ▼ Spatial Analyst Interface
- ▼ Querying Raster Themes

Raster Structure Themes

- ▼ Creating Raster Datasets
- ▼ Raster Storage and Management

Aligning Themes

- ▼ Raster Registration
- ▼ Raster Georeferencing
- ▼ Raster Projection
- ▼ Importing and Exporting Raster Datasets

Surface Analyses

- ▼ Calculating Density
- ▼ Interpolation Methods
- ▼ Interpolating
- ▼ Contours and Hillshading
- ▼ Visibility Analysis

Map Algebra Functions

- ▼ Writing Expressions
- ▼ Expression Syntax

Distance Measurements

- ▼ Euclidean Distance
- ▼ Cost Distance

Surface Hydrology

- ▼ Identifying Watershed Basins
- ▼ Surface Runoff Characteristics

WHO SHOULD ATTEND: Regulatory or AML scientist with degrees in geology, soil science, hydrology, civil or mining engineering, or related natural sciences.

COURSE PRE-REQUISITES: Students must have taken the **ArcGIS ARCINFO 8.x Desktop: For Mining and Reclamation** class and be very familiar with GIS concepts. **Class size is limited to 12–17 students depending on location.**



ArcPAD 7: Mobile GIS for Reclamation Mapping and Analysis



ArcPad is a mobile GIS software package developed by ESRI that is used to capture, display, analyze, and edit geographic information in the field. This focused course provides an introduction to ArcPad 7 and demonstrates some of its powerful capabilities that can be applied in the coal mining environment. Through a series of lectures, classroom, and field exercises students learn about the wide range of tools, menus, and style sheets that come with ArcPad and how ArcPad is used to gather and edit field data. The course emphasizes best practice principles and considerations for common field tasks.

Duration: 2 days

Course Code: GAP

TOPICS COVERED

Those completing this course will be able to

- ▼ Open a map in ArcPad and add layers to it.
- ▼ Explain the different data types used in ArcPad.
- ▼ Understand ArcPad tools and menus.
- ▼ Prepare and get data for ArcPad using desktop ArcGIS applications.
- ▼ Gain a basic understanding of GPS, coordinate systems, and map projections.
- ▼ Understand the functionality of GPS preferences in ArcPad.
- ▼ Change layer symbology and map displays.
- ▼ Find and edit features in ArcPad.
- ▼ Edit and add feature attributes.
- ▼ Create a new shapefile in ArcPad.
- ▼ Add and import fields to new shapefiles.
- ▼ Create customized data collection forms in ArcPad.
- ▼ Select the appropriate type of GPS and hardware unit for specific applications.

COURSE PRE-REQUISITES: Prospective students should have experience with GIS and GPS. Knowledge of ArcGIS software products is highly recommended. **Class size is limited to 12–17 students, depending on location.**

AutoCAD Fundamentals for Permitting and Reclamation

This course covers the fundamentals of AutoCAD and provides exposure to other AutoCAD and Carlson Mining products.

Duration: 3 days

Course Code: ECA



TOPICS COVERED

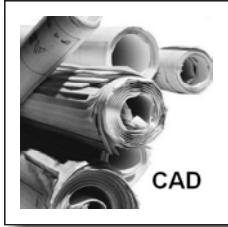
- ▼ Review file utilities and layer management
- ▼ Define drawing templates and the drawing environment
- ▼ Identify various configuration and customization settings
- ▼ Identify difference between 2D and 3D polylines
- ▼ Examine blocks, feature attributes, drawing tools, hatching, text types and editing tools Properties Perform property changes and import and export files
- ▼ Discuss plotting and paper space
- ▼ Review additional AutoCAD and Carlson Mining products
- ▼ Identify basic mobile computing concepts

WHO SHOULD ATTEND: Regulatory or AML scientists with degree in reclamation, geology, soil science, hydrology, civil or mining engineering, or related natural sciences.

COURSE PRE-REQUISITES: Basic understanding of the Windows operating system and knowledge of maps and drafting concepts is required. **Class size is limited to 12–17 students, depending on location.**



AutoCAD Map for Permitting and Reclamation



AutoCAD Map is an automated mapping tool used to create, maintain, and communicate mapping and GIS information while using the AutoCAD drawing environment. AutoCAD Map features GIS topology combined seamlessly with AutoCAD. This software contains all AutoCAD functionality and adds features specifically designed for the mapping professional.

Duration: 3 days

Course Code: EAM

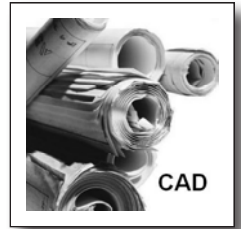
TOPICS COVERED

- ▼ Define GIS
- ▼ Utilize drawing sets, source drawings and external data
- ▼ Perform drawing queries
- ▼ Identify and define object data
- ▼ Define and edit global coordinate systems
- ▼ Perform coordinate transformations
- ▼ Import and Export map files
- ▼ Perform image editing (cleaning)
- ▼ Explain and perform rubber sheeting
- ▼ Discuss and use external databases
- ▼ Identify basic mobile computing concepts

WHO SHOULD ATTEND: Regulatory or AML scientists with degrees in reclamation, geology, soil science, hydrology, civil or mining engineering, or related natural sciences.

COURSE PRE-REQUISITES: Prospective students must have taken the introductory course AutoCAD Fundamentals for Permitting and Reclamation or have a working knowledge of AutoCAD. Basic AutoCAD skills will not be covered in this course. **Class size limited to 12–17 students depending on location.**

AutoCAD Map with Raster Design for Underground and Surface Mine Mapping



This course will take the student through an underground mine mapping project using AutoCAD Map with Raster Design. The student will learn to scan maps, vectorize and clean the mapping data, associate other tabular data and incorporate it into a GIS.

Duration: 3 days

Course Code: EUR

TOPICS COVERED

- ▼ Identify important steps to scanning mine maps and manipulating images
- ▼ Geo-reference imported mine maps
- ▼ Digitize and vectorize images
- ▼ Perform attribute data tagging
- ▼ Practice cleaning and building topology
- ▼ Verify feature mapping
- ▼ Practice exporting data to ESRI format
- ▼ Determine and discuss need for meta data

WHO SHOULD ATTEND: Regulatory or AML scientists with degrees in reclamation, geology, soil science, hydrology, civil or mining engineering, or related natural sciences.

COURSE PRE-REQUISITES: Prospective students should have a working knowledge of AutoCAD. The student will have a more meaningful training experience if they have taken AutoCAD Map for Permitting and Reclamation or have a working knowledge of AutoCAD Map. Basic AutoCAD skills will not be covered in this course. **Class size limited to 12–17 students depending on location.**



Blasting Log Evaluation Program (BLEP)



Participants will learn to compare and interpret blast log data with Microsoft Excel. Blast log data in Excel is used to cross tabulate fields for accuracy and compare relationships with accepted industry blast design parameters and vibration propagation norms. Burdens, spacings, hole depths and explosive types are used to calculate charge weights, powder factors, and scaled distances for comparison with blast vibration monitoring data. Compliance with the rules and prediction of vibrations are discussed. Real-world datasets will be used to illustrate analysis techniques under various blasting and monitoring scenarios.

Duration: 2 days

Course Code: EBL

TOPICS COVERED

Learn Excel basics on data entry, formulas and graphing, review fundamentals of ground vibrations, airblast and flyrock, understand BLEP downloading, data entry and use, practice expedient data entry, interpret BLEP Graphs, explore full and partial data entry uses, identify outlier points, discuss case studies and exercises, and generate output displays for reports.

- ▼ Introduction to blasting basics
- ▼ Using Excel
 - ◇ *Navigation*
 - ◇ *Calculating fields*
 - ◇ *Replicating fields*
 - ◇ *Making graphs*
 - ◇ *Timing blast patterns*
- ▼ Using BLEP
 - ◇ *Data entry*
 - ◇ *Data formats*
 - ◇ *Specialty applications*
- ▼ BLEP Graphs
 - ◇ *Interpretation*
 - ◇ *Outlying points*
 - ◇ *Estimating ground vibrations*
 - ◇ *Estimating airblast*
 - ◇ *Gauging flyrock potential*
 - ◇ *How to focus inspections*
- ▼ Case Studies
- ▼ Course Help
 - ◇ *BLEP on-line course*
- ▼ Specialty applications using Excel to address complaints
 - ◇ *Compiling data*
 - ◇ *Specialty graphs*
 - ◇ *Statistics*
- ▼ References
- ▼ Feedback

COURSE PRE-REQUISITES: Completion of the NTTP class “Blasting and Inspection” or knowledge of blast design and blast log documentation. **Class size limited to 12–17 students depending on location.**

Carlson Mining for Permitting and Reclamation (SurvCADD)

Carlson Mining is a design software for engineering, surveying, reclamation and mining professionals. AutoCAD serves as its graphics engine and drawing editor. Carlson Mining is an extension of AutoCAD that adds commands and enhancements for earthmoving and engineering. Modules include: Cogo-Design, DTM-Contour, Section-Profile, Mining, and Hydrology.

Duration: 3 days

Course Code: ESC



TOPICS COVERED

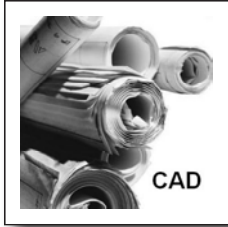
- ▼ Identify file types
- ▼ Define drawings, and setup options
- ▼ Import and Export Points
- ▼ Manage drawing layers
- ▼ Perform heads-up digitizing
- ▼ Experiment with 3D landform viewing, and contouring
- ▼ Produce cross sections and profiles
- ▼ Examine design techniques
- ▼ Create a design templates in plan view
- ▼ Identify basic mobile computing concepts

WHO SHOULD ATTEND: Regulatory or AML scientists with degrees in civil or mining engineering, geology, or related disciplines.

COURSE PRE-REQUISITES: Prospective students must have taken introductory course AutoCAD Fundamentals for Permitting and Reclamation or have a working knowledge of AutoCAD. Basic AutoCAD skills will not be covered in this course. **Class size limited to 12–17 students depending on location.**



Carlson Mining's Natural Regrade for Permitting and Reclamation



This course covers Carlson Software's Natural Regrade module which applies fluvial geomorphology to land reclamation. Topics include determining inputs in the field, using Natural Regrade as a permitting/evaluation tool, and reclamation design using Natural Regrade.

Duration: 3 days

Course Code: EGN

TOPICS COVERED

- ▼ Define Natural Regrade module
- ▼ Discuss pros and cons of using software
- ▼ Review basic principles of fluvial geomorphology
- ▼ Determine proper inputs from field data
- ▼ Utilize software to develop reclamation plans
- ▼ Analyze methods to review/evaluate submitted geomorphic plans

COURSE PRE-REQUISITES: Prospective students should have completed the online Geomorphic Principles course and attended AutoCAD Fundamentals for Permitting and Reclamation or have a working knowledge of AutoCAD. It is recommended that students have attended Carlson Mining for Permitting and Reclamation before attending this course. **Class size limited to 12–17 students depending on location.**

E-Tools for Permitting and Reclamation

The course is designed to teach the student the potential of using ArcGIS Desktop and ArcGIS Mobile GIS capabilities as an integral addition to the workflow for coal-mine permitting processes.

Duration: 3 days

Course Code: GDF



TOPICS COVERED

Students will learn to recognize various file types and differences between formats, e.g. Raster vs. Vector, Shapefile, Aerial photos/Satellite images, DRG's, DOQQ's, GPS and CAD layers. Students will learn what coordinate systems, datums and projections are and why understanding them is vital to working with spatial data. Extraction of CAD layers into the GIS, modifying attributes of shapefiles, geo-rectification and scanning will be covered. Introduction to various mobile computing software and hardware that TIPS supports and how it relates to the permitting process workflow will be examined. Use of simple tools and utilities in ArcGIS, and creation of professional-quality maps will round out the course.

COURSE PRE-REQUISITES: None. **Class size limited to 12–17 students depending on location.**

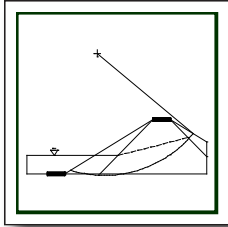


Galena Slope Stability Analysis

Slope Analysis software is used for performing stability analyses of backfills, road embankments, pond embankments, landslides, or natural slopes. These slopes occur on reclaimed lands and active mine sites. The software models the factor of safety of these features using the Simplified Bishop, Spencer, and Sarma methods of analysis. The course includes a review of slope stability principles before using the software. The course is intended only for engineers or geology professionals with a slope stability background.

Duration: 2 days

Course Code: EGS



TOPICS COVERED

Soil Mechanics Theory

- ▼ Basic Principles of Soil and Rock Testing
- ▼ Soil Failure Mechanisms
- ▼ Soil Properties
- ▼ The Role of Water

The Stability Analysis

- ▼ Determining Appropriate Strength Parameters
- ▼ The Bishop Circular Analysis
- ▼ Use of Stability Charts
 - ◇ *Estimating Factors of Safety*
 - ◇ *Determining Critical Failure Surfaces*
- ▼ Spencer Method
- ▼ Sarma Method

Soils Laboratory Methods Video

Use of the Software

- ▼ Fundamentals of the Program
- ▼ Data Entry
 - ◇ *Embankment Geometry*
 - ◇ *Delineation of Soil Types*
 - ◇ *Use of Phreatic Surface or Pore Pressure Ratio*
 - ◇ *Strength Parameters*
 - ◇ *Tension Crack Data*
 - ◇ *Seismic Coefficients for Dynamic Loads*
 - ◇ *Fluid Unit Weight for Impoundments*
- ▼ Selection of Analytical Method
 - ◇ *Modified Bishop Method for Circular Failure*
 - ◇ *Spencer Method for Circular and Non-Circular Failure*
 - ◇ *Sarma Method for Non-Circular Failure*
- ▼ Running the Stability Analysis
 - ◇ *Selecting Method of Search for Minimum Factor of Safety (Critical Failure Surface)*

- ▼ Interpreting Results
 - ◇ *Evaluating Shallow vs Deep*
 - ◇ *Failure Surfaces*
- ▼ Efficient/Effective Use of the Model—When enough is enough
 - ◇ *Guarding Against Manipulation of the Model to Get Acceptable Factors of Safety*
 - ◇ *Use of Realistic Input Parameters*

Output

- ▼ Reports
- ▼ Base Maps
- ▼ Contour Maps
- ▼ Perspectives and Block Diagrams
- ▼ Cross-sections and Fence Diagrams

The Workflow Manager™

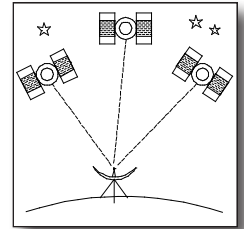
Some Applications

- ▼ Structure
- ▼ Cut and Fill Volumes
- ▼ Reserve Calculations
- ▼ Slope Analysis

WHO SHOULD ATTEND: Regulatory or AML scientists with degrees in geology, civil or mining engineering, engineering geology, geological engineering, soil science or experience in geotechnical construction or slope stability remediation. Nominees should be responsible for inspecting or designing corrections for slope failures, or reviewing factor of safety calculations for permit applications.

COURSE PRE-REQUISITES: None. **Class size limited to 12–17 students depending on location.**

GeoExplorer 3 GPS & PF Office: Advanced GPS Mapping for Reclamation



GPS technology uses satellite triangulation to allow rapid, accurate surface positioning of mine features. Applications in reclamation include: verification of stream buffer zones, locating roads, jurisdictional boundaries, ponds, or other features relative to permit boundaries, mapping seeps, outcrops and AML site locations for inventory update and acreage determination, and measuring the size of minesite disturbance areas. This course will provide advanced topics in reclamation-oriented GPS use and includes extensive hands-on field exercises with GPS receivers and software. Three reclamation-oriented field exercises are included for students to collect and process GPS data using advanced techniques adapted specifically for active and abandoned minesites.

Duration: 3 days
Course Code: GLA

TOPICS COVERED

GPS Refresher

- ▼ The GPS System in 2008
- ▼ Satellite Ranging
- ▼ Differential and Real-Time Correction
- ▼ Advanced Error Detection

Factors Affecting GPS Accuracy

- ▼ Satellite Factors
- ▼ Software Settings
- ▼ Correction Method

Advanced Project Planning

- ▼ Virtual Field Reconnaissance
- ▼ Equipment Setup
- ▼ Data Collection
- ▼ Data Processing
- ▼ GPS data dictionary creation, editing and Geographic Information Systems (GIS)
- ▼ Quick Plan

GeoExplorer 3 Setup

- ▼ Hardware Components
- ▼ Receiver Configuration
- ▼ Data Settings
- ▼ Coordinate System and Datums
- ▼ Altitude Reference

Field Sessions

- ▼ Equipment Operation
- ▼ Advanced Data Collection
- ▼ Attribute Modification
- ▼ Advanced Navigation
- ▼ Advanced Waypoint Generation and Use

Data Processing with PF Office

- ▼ Transferring Files to PF Office
- ▼ Configuring PF Office
- ▼ Differential Correction
- ▼ Viewing Data Files
- ▼ Distance Measurement
- ▼ Feature and Attribute Querying
- ▼ Offsets
- ▼ Creating Non-GPS Features
- ▼ Background Maps and Graphics
- ▼ Data Editing
- ▼ Map Plotting
- ▼ Exporting to CAD & GIS Programs

Surface Mining and Reclamation Applications

- ▼ Baseline Vegetation Surveying
- ▼ Vegetation Monitoring
- ▼ AML Mapping and Project Estimation
- ▼ Mapping Mine Area Features
- ▼ Mapping Mine Linear and Point Features

COURSE PRE-REQUISITES: Prospective students must bring a Geoexplorer 3 to class from their office. If two students attend from a TIPS customer location, then students may share one GeoExplorer3. Because of the specialized nature of the equipment and techniques, no substitute GPS units may be used. Familiarity with GIS or CAD software and map reading is highly recommended. **Class size limited to 12–17 students depending on location.**



Image Analysis for ArcGIS

This course will teach students how to process and prepare satellite images and air photographs so they can be used to update, enhance, and expand your vector GIS.
Course Level: Intermediate.

Duration: 3 days
Course Code: GIA



TOPICS COVERED

Understand display and enhance raster imagery within ArcMap:

- ▼ Import satellite data using Arc Toolbox
- ▼ Reproject imagery and create orthorectified images
- ▼ Mosaic images to create a single seamless image
- ▼ Subset imagery to create smaller files
- ▼ Perform unsupervised and supervised classification of satellite imagery
- ▼ Identify and extract changes through change detection, and update and manipulate vector and raster attributes

COURSE PRE-REQUISITES: Prospective students should have completed an “Introduction to ArcGIS” class. **Class size limited to 12–17 students depending on location.**

Introduction to ARCGIS for Mining And Reclamation



Introduction to the basics of ArcInfo Desktop software. This course is designed around mining and reclamation examples and exercises. The various types of GIS data and how they are used in Desktop will be covered. Techniques for using the features of this software to generate high quality maps and analyzing selected data sets are taught. Specific training areas will be ArcCatalog, ArcMap & ArcToolbox.



Duration: 3 days

Course Code: GAD

TOPICS COVERED

GIS Concepts

- ▼ Data Models
- ▼ Topology
- ▼ Projections & Datums
- ▼ Coordinate Systems

GIS Functions

- ▼ Capturing Data
- ▼ Storing Data
- ▼ Query
- ▼ Analysis
- ▼ Display
- ▼ Output

Working with Data

- ▼ Grouping Features
- ▼ Linking Features
- ▼ Raster vs. Vector Data
- ▼ Geodatabase

Data Display

- ▼ Data View
- ▼ Layout
- ▼ Thumbnails
- ▼ Maps
- ▼ Layer Symbology

Database Query

- ▼ Measuring
- ▼ Selection Tools
- ▼ Identifying
- ▼ Tips & Hyperlinks
- ▼ Selection Methods

Geospatial Analysis

- ▼ Proximity analysis
- ▼ Overlay
- ▼ Geospatial Extraction
- ▼ ArcToolbox

Data Presentation

- ▼ Map Elements
- ▼ Legend
- ▼ North Arrow
- ▼ Scale Bar
- ▼ Neat Lines
- ▼ Inserting Text, Charts, Reports & Images
- ▼ Printing & Plotting

WHO SHOULD ATTEND: Regulatory or AML scientists with degrees in geology, soil science, hydrology, civil or mining engineering, or related natural sciences.

COURSE PRE-REQUISITES: Familiarity with GIS or mapping concepts is helpful. **Class size limited to 12–17 students depending on location.**



Introduction to GPS with Garmin eTrex Vista C



An introduction to the low-cost hand held GPS unit Garmin eTrex Vista C, along with data collection, data management, and map output/display for Title 4 and Title 5 applications. The basics of GPS technology and terminology will be discussed. Two programs will be used to manage and display the GPS data, Map Source MetroGuide North America v6 and TopoFusion. Each student will be able to plot field data on topographic maps, aerial photographs and 3-D pictures at completion of the class for inclusion with inspection reports or citizen complaint reports.

Duration: 2 days

Course Code: GEV

TOPICS COVERED

- ▼ Introduction to GPS systems
- ▼ GPS basic terminology
- ▼ Understand Garmin eTrex Vista use
 - ◇ *Features and programming*
 - ◇ *Active mine data collection*
 - ◇ *Abandoned mine data collection*
- ▼ Data acquisition in the field
 - ◇ *Waypoints*
 - ◇ *Tracks*
 - ◇ *Areas*
 - ◇ *Attributes*
- ▼ Data management with MapSource
 - ◇ *Data Download*
 - ◇ *File management*
 - ◇ *Data movement between files*
 - ◇ *Data editing*
 - ◇ *Data export to .gpx*
- ▼ Generate Map Output Displays with TopoFusion
 - ◇ *Import files*
 - ◇ *Display data on topographic maps*
 - ◇ *Display data on aerial photographs*
 - ◇ *Display data on 3-D projections*
 - ◇ *Landsat images*
 - ◇ *Export to shape files*

Field Exercises: All those attending Global Positioning System (GPS) courses must bring outdoor-clothing and shoes and be prepared for inclement weather. GPS outdoor sessions will be held rain or shine.

COURSE PRE-REQUISITES: None. **Class size limited to 12–17 students depending on location.**

Modeling and Analysis with Groundwater Vistas



This hands-on course will review the underlying assumptions, theories, and practical utilization of numerical flow models. The fundamental underpinnings of the course revolve around conceptually modeling ground-water flow and the application of the Groundwater Vistas software. Students will work examples applying this software to coal mining and reclamation related analysis.



Duration: 3-1/2 days

Course Code: HGV

TOPICS COVERED

Review of Scientific Theory

- ▼ Geology Aquifer, Aquitard, Aquiclude
 - ◇ *Confined, Unconfined, Porosity*
 - ◇ *Fractures and Structures Permeability*
- ▼ Basic Ground—Water Hydrology
 - ◇ *Darcy's Law, Hydrologic Balance*
 - ◇ *Equilibrium Versus Nonequilibrium*
 - ◇ *Homogeneous Versus Heterogeneous*
 - ◇ *Anisotropic Versus Isotropic*
 - ◇ *De-pressurizing*
- ▼ Basic Modeling
 - ◇ *Numerical modeling, Types of models*
 - ◇ *Inverse versus forward modeling*
 - ◇ *Transient versus equilibrium*

Groundwater Vistas Software Use

- ▼ Types of Numerical Models/Solutions
- ▼ Finite Difference, Finite Element
- ▼ Diffusion Equation, Grids, Layers
- ▼ Initial Conditions, Dimensionality
- ▼ Space Discretization, Boundary Conditions
- ▼ Water Budget Error, Error Criteria
- ▼ Steady—State Case Analysis
 - ◇ *Site Description, Conceptual Model*
 - ◇ *Building the Model, Run Model*
 - ◇ *Calibration, Sensitivity Analysis*
 - ◇ *Model Adjustment*
 - ◇ *Model Output Analysis, Interpreting Results Validation*

Reviewing Permitting Information done by Models

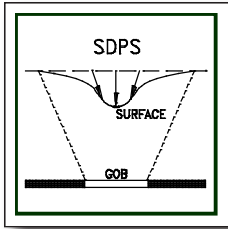
- ▼ Model Representation of Groundwater Systems
- ▼ Input Parameter Estimation
- ▼ Real World Coal Mining Case Study

WHO SHOULD ATTEND: Regulatory or AML scientists with degrees or college credit in hydrology, or current experience in ground-water hydrology, with six months to one year of experience with SMCRA.

COURSE PRE-REQUISITES: Prospective students should possess a working knowledge of terminology including hydraulic conductivity, storativity, transmissivity, and Darcy's law. Prospective students should have also successfully completed the NTPP course Quantitative Hydrogeology. **Class size is limited to 12–17 students depending on location.**



SDPS: Surface Deformation Prediction System



SDPS is a nationally-validated prediction program developed for OSM to quantify anticipated subsidence deformations and strains from underground longwall and high-extraction room and pillar mining operations. This hands-on course, with case studies, will give students responsible for evaluating the effects of subsidence a predictive tool to assist in evaluating day-to-day work assignments.

Duration: 2 days
Course Code: ESD

TOPICS COVERED

Review of Subsidence Mechanisms And Theories

- ▼ Overview of Subsidence Parameters

Software Overview

- ▼ Configuration Options
- ▼ File Conventions

Required Field and Input Parameters Prediction of Surface Deformations

- ▼ Data Collection
- ▼ Maximum Subsidence Factor
- ▼ Location of the Inflection Point
- ▼ Angle of Principal Influence
- ▼ Horizontal Strain Coefficient
- ▼ Limitations of Empirical Parameters

Software Modules

- ▼ Profile Function
 - ◇ *Angle of Draw*
 - ◇ *Subsidence Profile*
- ▼ Influence Function
 - ◇ *Input Data*
 - ◇ *Mine Plan*
 - ◇ *Prediction Points*
 - ◇ *Empirical Parameters*
 - ◇ *Calculation Options*

- ▼ Graphing Module

- ◇ *2-D*
- ◇ *3-D*

- ▼ Pillar Stability

- ◇ *Conventional Pillar Stability*
- ◇ *Analysis of Longwall Pillar Stability (ALPS)*
- ◇ *Analysis of Retreat Mining Pillar Stability (ARMPS)*

Data Import and Export

- ▼ Importing Mine Plan through AutoCAD
- ▼ Importing Prediction Points through AutoCAD
- ▼ Exporting Subsidence Profiles to AutoCAD

Exercises with AutoCAD

Plotting and Printing

Peripheral Hardware

WHO SHOULD ATTEND: For engineers and/or geologists who work with subsidence prediction.

COURSE PRE-REQUISITES: Basic mine subsidence knowledge. **Class size is limited to 12–17 students depending on location.**

SEDCAD Applications and Extensions for Mine Permitting and Reclamation



This course covers a broad review of the basic hydrologic concepts and assumptions, defines the input parameters for watershed modeling and design of sediment control structures utilizing SEDCAD for mine permitting and reclamation. The participants will learn how to use SEDCAD to model peak flow, runoff volume, design erosion and sediment control structures and to evaluate permit applications. In addition, the course will cover utilizing SEDCAD to evaluate peak flow in preparation of Cumulative Hydrologic Impact Assessments. An introduction to the Revised Universal Soil Loss Equation will also be covered. Students will work example problems applying this software to model watersheds, analyze peak flow and design sediment basins, channels, culverts, silt fence and other drainage control structures.

Duration: 3 days
Course Code: HSA

TOPICS COVERED

At the end of this course, students will be able to:

- ▼ Design and evaluate sediment and drainage control structures
- ▼ Predict the effectiveness of sediment basins
- ▼ Apply RUSLE to calculate sediment load
- ▼ Calculate peak flow and runoff volume; develop peak flow hydrograph and sedimentgraph
- ▼ Perform watershed modeling including structure networking and Muskingum routing
- ▼ Evaluate hydrology and sedimentology input parameters
- ▼ Generate and review final report

WHO SHOULD ATTEND: regulatory or AML scientists with degrees in hydrology, civil or mining engineering, or soil scientists who design or review designs of diversions, sediment control structures, and impoundments, with six months to one year of experience with SMCRA.

COURSE PRE-REQUISITES: Students should have some knowledge of surface water hydrologic principles and computer experience. Completion of the NTPP courses “Applied Engineering Principles” and Surface and Groundwater Hydrology would be helpful. **Class size is limited to 12–17 students depending on location.**



Testing and Analysis of Aquifer Characteristics with AQTESOLV



This hands-on course will review the underlying assumptions and theories of aquifer characterization and the practical utilization of analytical ground-water models. The course will provide an introduction to the use of AQTESOLV including analysis of confined, unconfined, leaky, and fractured aquifers. Students will work examples applying this software to coal mining and reclamation-related examples using pump test, slug test, drawdown and recovery data.

Duration: 3 days

Course Code: HAA

TOPICS COVERED

Review of Scientific Theory

- ▼ Basic Ground-Water Hydrology
 - ◇ *Aquifer Types, Confining Layers, Darcy's Law, Fracture Flow, Hydraulic Head, Theis Equation, Thiem Equation, Well Completions*
- ▼ Aquifer Characteristics
 - ◇ *Hydraulic Conductivity, Transmissivity, Storativity, Permeability, Specific Storage, Specific Yield, Pump Tests, Slug Tests, Recovery Tests*
- ▼ Basic Modeling
 - ◇ *Model Types Conceptual Analytical, Numerical Inverse Versus Forward Transient Versus Equilibrium*

AQTESOLV Software Use

- ▼ Types of Analytical Models & Solutions
- ▼ Slug Tests, Pump Tests
- ▼ Time Drawdown, Well bore storage
- ▼ Boundaries (recharge—no flow)
- ▼ Curve Matching
- ▼ Data Needs, Input, Validity, QA/QC
- ▼ Data Interpretation, Data Analysis

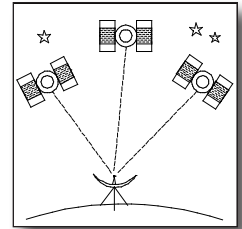
Reviewing Permit Information done by Models

- ▼ Model Representation of the Ground-Water System and Test Solutions
- ▼ Realistic Input Parameters
- ▼ Coal Mine Case Study Examples

WHO SHOULD ATTEND: Regulatory or AML scientists with degrees or college credit in hydrology, or current experience in ground-water hydrology, with six months to one year of experience with SMCRA.

COURSE PRE-REQUISITES: Prospective students should possess a working knowledge of ground-water terminology and concepts, including hydraulic conductivity, storativity, transmissivity, and Darcy's law. Prospective students should have also successfully completed the NTTP course Quantitative Hydrogeology. **Class size limited to 12–17 students depending on location.**

Trimble GeoXT, Terrasync and PF Office: Mobile Computing for Reclamation



In this class, participants will become proficient using the Trimble GeoXT with TerraSync software through reclamation-related classroom and field exercises. Mobile computing with the Trimble GeoXT and TerraSync combines a very capable GPS engine with powerful navigation and data collection software. Real-time corrections from the integrated WAAS/EGNOS receiver typically are of sub-meter accuracy. Participants will process their field data using Pathfinder Office software. The use of background images in map display, including satellite imagery, aerial photos, and images are an important feature of the class.

Duration: 3 days
Course Code: GTS

TOPICS COVERED

GPS Refresher

- ▼ The GPS System in 2008
- ▼ Satellite Ranging
- ▼ Differential and Real-Time Correction
- ▼ Advanced Error Detection

Factors Affecting GPS Accuracy

- ▼ Satellite Factors
- ▼ Software Settings
- ▼ Correction Method

Mobile Computing Project Planning

- ▼ Virtual Field Reconnaissance
- ▼ Data Collection
- ▼ Data Processing
- ▼ GPS data dictionary creation, editing and Geographic Information Systems (GIS)
- ▼ Quick Plan

GeoXT Setup

- ▼ TerraSync Components
- ▼ GeoExplorer CE Series Handheld
 - ◇ *Using GPS*
 - ◇ *Connecting to ActiveSync*
 - ◇ *Using the GeoExplorer CE Device*
 - ◇ *Installing Software on the Device*
- ▼ Using TerraSync Software
- ▼ Configuring Critical Settings in TerraSync
 - ◇ *GPS settings*
 - ◇ *Logging settings*
 - ◇ *Real-time settings*
 - ◇ *Coordinate settings*
 - ◇ *Unit settings*
- ▼ Equipment Assembly
- ▼ Background Maps and Images

Field Sessions

- ▼ GeoXT Operation
- ▼ GPS status checking
- ▼ Status Bar
- ▼ Basic Data Collection
- ▼ Advanced Data Collection
- ▼ Navigation Using Background Imagery

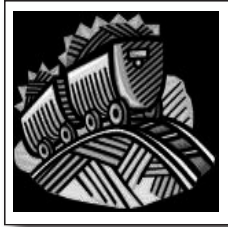
Data Processing with PF Office

- ▼ Transferring Field Data to PF Office
- ▼ Configuring PF Office
- ▼ Differential Correction
- ▼ Viewing Data Files
- ▼ Distance Measurement
- ▼ Feature and Attribute Querying
- ▼ Offsets
- ▼ Creating Non-GPS Features
- ▼ Background Maps and Graphics
- ▼ Data Editing
- ▼ Map Plotting
- ▼ Exporting to CAD & GIS Programs

COURSE PRE-REQUISITES: Prospective students must bring a GeoXT with TerraSync loaded to class from their office. If two students attend from a TIPS customer location, then students may share one GeoXT. Familiarity with map reading, GIS concepts and CAD or GIS software is desirable. **Class size is limited to 12–17 students depending on location.**



Underground Mine Mapping with GIS



This course explores the methods that are used to convert hardcopy underground mine maps to an electronic data format and explore this data using ArcGIS.

Duration: 3 days

Course Code: GUM

TOPICS COVERED

The care and restoration of hardcopy underground mine maps

- ▼ Mine Map Database Design and Management
- ▼ Scanning maps into a raster format
- ▼ Raster editing and vectorizing
- ▼ Intro to ArcMap and ArcCatalog
- ▼ Georeferencing and Digitizing

- ▼ Disseminating Digital Data
- ▼ Displaying maps
- ▼ Case studies

COURSE PRE-REQUISITES: None. Class size limited to 12–17 students depending on location.

Additional Offerings

ADDITIONAL OFFERINGS CONTACT

APPLICANT VIOLATOR SYSTEM

Debbie Feheley
Office of Surface Mining Reclamation
and Enforcement
Applicant Violator System Office
2679 Regency Road
Lexington, KY 40503
(859) 260-3932 or (800) 643-9748
Fax No: (859) 260-8418
E-mail: dfeheley@osmre.gov

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ADDITIONAL OFFERINGS:

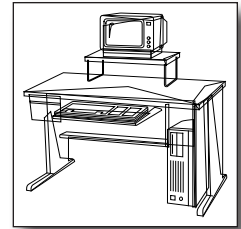
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APPLICANT/VIOLATOR SYSTEM (AVS)

AVS: Basic Applicant /Violator System Usage	C-1
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**AVS
OFFERING**

AVS: Basic Applicant/Violator System Usage



This course is designed to familiarize new users with the Applicant/Violator System and to provide refresher training to more experienced users of the system. This course will provide user with guidance, instruction and practical application in the procedures utilized in accessing data from the Applicant/Violator System. **Duration: 2 day**

TOPICS COVERED

- ▼ Understanding of how AVS works with regard to linking entities to violations and how data entered into the system may cause an entity to become permit ineligible.
- ▼ How to conduct an entity check.
- ▼ How to view addresses, application and permit records, owners and controllers, and violation information.
- ▼ How to determine whether an entity is permit eligible.
- ▼ How to create new entities, enter application and permit information, enter violation information and ownership and control information disclosed on a permit application.
- ▼ How to perform updates to existing information.
- ▼ Identifying permitting and enforcement actions that may require a system update.

WHO SHOULD ATTEND: State/Federal permitting, enforcement and management staff; OSM Compliance Management staff, OSM Field Solicitors, and OSM Division of Financial Management staff.

COMMENTS: This course is conducted according to user demands and location is determined by most convenient and economical travel for all parties. Training course is offered at no expense to participants; however, travel and per diem costs are the responsibility of each participating office.

Applicant/Violator System, Lexington Office:
(859) 260-3932 or (800) 643-9748.

Instructor Biographies

MIKE ABBOTT

Virginia Department of Mines, Minerals and Energy, Public Relations Manager, B.F.A. Communication Arts and Design, Virginia Commonwealth University, 27 years experience in state government public information/relations including state parks, community college system, and mining, minerals and energy; two years in coal industry, three years operating graphic arts business. *Instructor for Coalfield Communications.*

TODD ALFREY

Kentucky Department of Surface Mining, Pikeville Regional Office; Geologist; B.S., Geology, Morehead State University, graduate studies in hydrology; seven years with Kentucky DSMRE, seven years experience in environmental and geotechnical consulting. *Instructor for Water Quality Analysis using Aqua Chem and Testing and Analysis of Aquifer Characteristics with AQTESOLV.*

DAVID AGNOR

U.S. Office of Surface Mining (OSM-ACOH); Regulatory Program Specialist, B.S., Geology, Campbell University; 21 years experience with OSM as an inspector and program specialist, five years experience with mining industry. *Instructor for ArcGIS.*

PATRICK ANGEL

U.S. Office of Surface Mining (OSM-AR) (London Area Office); Forester and Soil Scientist, B.S. & M.S., Forestry, Stephen F. Austin State University; Ph.D., Soil Science, University of Kentucky; 30 years with OSM. *Instructor for Soils and Revegetation.*

JULIE ANNEAR

Colorado Department of Natural Resources; Environmental Protection Specialist, B.A., Environmental Conservation, University of Colorado, M.S., Finance and International Economic Development, has 20 years experience with Colorado Abandoned Mined Land. *Instructor for AML Reclamation Projects.*

DARRYL J. AUDIA, SR.

Pennsylvania Department of Environmental Protection, Bureau of Abandoned Mines, (DEP-BAMR), Real Estate Section; Appraiser, Property Investigator and Right of Way Expert; Certified Real Estate Appraiser; Certified Real Estate Instructor; B.A., Communications, University of Pittsburgh; Post Graduate Studies in Real Estate: Robert Morris College, Duquesne University, Allegheny Community College, Florida Gold Coast School of Real Estate; has 14 years experience with BAMR, ten years as a Certified Real Estate Appraiser, 30 years as a Pennsylvania Real Estate Agent, 23 years as a Real Estate Broker, 12 years as owner of Audia Real Estate, Past President and past Vice President of the Lawrence County, PA Board of Realtors. *Instructor for AML Realty.*

HENRY AUSTIN

U.S. Office of Surface Mining (OSM-WR); Reclamation Specialist; B.S., Forestry, Southern Illinois University; has 22 years experience with OSM. *Instructor for Principles of Inspection.*

JOHN W. AUSTIN

U.S. Department of the Interior, Office of the Solicitor, Southeast Region, Knoxville Field Office; Senior Staff Attorney; B.A., History, J.D., University of Tennessee; has 17 years experience with the Solicitor's Office in administrative law, defensive litigation, collections, alternative enforcement and drafting regulations. *Instructor for Enforcement Procedures, Enforcement Tools and Applications, Evidence Preparation and Testimony, and Expert Witness.*

WAYNE BABCOCK

U.S. Department of the Interior, Office of the Field Solicitor, Northeast Region, Pittsburgh Field Office; B.A., Political Science, University of Pittsburgh; J.D., University of Pittsburgh School of Law; with Solicitor's Office since 1987, primarily trying administrative and judicial cases involving surface coal mining regulation. *Instructor for Evidence Preparation and Testimony and Expert Witness.*

GREGORY F. BAKER

Virginia Department of Mines, Minerals and Energy, Reclamation Program Manager, has 19 years experience with Virginia Department Mines and Minerals and Energy, seven years with Industry. *Instructor for Bonding Workshop: Administrative and Legal Aspects, Enforcement Procedures, Evidence Preparation and Testimony, and Principles of Inspection.*

PAUL BAKER

Utah Department of Natural Resources; Senior Reclamation Biologist; B.S., Botany, Weber State College, M.S., Range Ecology, Utah State University; 13 years experience with Utah DOGM. *Instructor for SMCRA/ESA and Wetlands Awareness.*

TRACE BAKER

Pennsylvania Dept. of Environmental Protection; Drafter-Designer Bureau of Abandoned Mine Reclamation, Blackhawk College, 25 years experience in Civil Design and CADD, 3.5 years experience with mining industry. *Instructor and Course Developer for Carlson Mining for Permitting and Reclamation (SurvCADD) and Advanced Carlson Mining for Permitting and Reclamation.*

STEVE BALL

West Virginia Department of Environmental Protection, Division of Mining and Reclamation; Geologist, B.S., West Virginia University; B.S. School of Agriculture and Forestry, West Virginia University (majored in Wildlife Resource Management); 17 years experience with WVDEP as environmental inspector for surface and underground coal mines and rock quarries. *Instructor for Forensic Hydrologic Investigation.*

EARL D. BANDY, Jr.

U.S. Office of Surface Mining (OSM-AR); Chief Applicant/Violator System; B.S., Mining and Reclamation, Lincoln Memorial University; 27 years experience with OSM as inspector, investigator, and manager; three years as inspector with KY Dept. for Surface Mining, one year with industry. Specializes in bankruptcy, alternative enforcement and ownership and control issues. *Instructor for Enforcement Tools and Applications.*

ERVIN BARCHENGER

U.S. Office of Surface Mining (OSM-MCR); Regional Director; B.A., Biology, Concordia College; M.S., Botany, North Dakota State University; has 30 years experience in surface coal mining and reclamation programs with the North Dakota Public Service Commission-Reclamation Division and with OSM in Denver, Kansas City, and Alton, IL. *Instructor for Permit Findings Workshop.*

DANIEL W. BARKLEY

Illinois Department of Natural Resources, Office of Mines and Minerals; Environmental Protection Specialist IV; B.S., Mining Engineering, Pennsylvania State University; Registered Professional Engineer; 14 years experience as a mining engineer and subsidence specialist with the Illinois Office of Mines and Minerals, two years mine subsidence research experience with the Illinois State Geological Survey. *Instructor for Subsidence and Underground Mining.*

MARC BARRACLOUGH

West Virginia Department of Environmental Protection (WVDEP), Technical Applications and Geographic Information Systems (TAGIS) Unit since 2004, Remote Sensing/GIS Analyst; B.A., Urban Studies and History, University of Pittsburgh, M.A., Geography, West Virginia University. *Instructor for Image Analysis for ArcGIS.*

LONNIE BARRIER

Mississippi Department of Environmental Quality; Engineer; B.S. Civil Engineer, P.E. in MS & LA; Registered Land Surveyor with design construction and contract management experience, MBA with accounting, budgeting, and personnel management experience. *Instructor for Applied Engineering Principles, Erosion and Sediment Control, Principles of Inspection, and Surface and Groundwater Hydrology.*

WILLIAM C. BASS

(Retired) U.S. Office of Surface Mining (OSM-AR); Safety and Occupational Health Manager and Aviation Safety Manager; B.S., University of Pittsburgh; M.S., Marshall University; has 14 years experience with OSM, 19 years experience as an education and training specialist and instructor with MSHA. *Instructor for Instructor Training Course.*

RICHARD BEAM

Pennsylvania Department of Environmental Protection, Bureau of Abandoned Mine Reclamation. B.S., Geology, University of Pittsburgh. Three years geotechnical engineering experience and 23 years with the both the Commonwealth's Title IV and V mining programs. Primary duties include the evaluation of abandoned mine sites where mine drainage abatement projects are proposed and preparation or review of watershed studies to determine AMD impacts and potential abatement methods and or site selection. Responsible for the collection and analysis of surface and subsurface geologic and hydrologic information needed for the development and design of reclamation projects. Provides technical assistance to local organizations with respect to AMD abatement projects. ***Instructor for Acid-Forming Materials: Fundamentals and Applications.***

PAUL T. BEHUM

U.S. Office of Surface Mining (OSM-MCR); Hydrologist; has 15 years experience with OSM, ten years experience with the Bureau of Mines; M.S. and B.S., Geology, University of Pittsburgh. ***Instructor for Bonding Workshop: Cost Estimation, Passive Treatment, and Surface and Groundwater Hydrology.***

DEBORAH BELL

Colorado Division of Reclamation, Mining and Safety; IT Professional III, AAS, Computer Programming for Business, B.A., Organizational Communications, MCIS, Master Computer Information Systems, University of Denver; 13 years experience working in Information Technology in the Department of Natural Resources. ***Instructor and Course Developer for GPS Analyst for ArcGIS.***

DAVID BEST

U.S. Office of Surface Mining (OSM-MCR); Civil Engineer; has 20 years experience with OSM, 12 years experience with the Tennessee Valley Authority; B.S., Civil Engineering, University of Missouri–Rolla. ***Instructor for Applied Engineering Principles and SEDCAD for Mine Permitting and Reclamation.***

DAVID BICKEL

Bickel Consulting, LLC, consulting geohydrologist and geologist to mining and petroleum industries; Ph.D. Ohio State University; 38 years experience in academia, industry and government; retired after 18 years with North Dakota Public Service Commission mine regulatory program. ***Instructor for Analyzing Environmental Monitoring Data Using StatGraphics Plus.***

ALAN BOEHMS

U.S. Office of Surface Mining; AML & Regulatory Program Specialist; B.S. Forestry, University of Tennessee, 23 years experience with Department of the Interior as inspector, environmental protection specialist, ecologist and program specialist, Trimble Navigation Certified Trainer, four years in Tennessee state government including coal regulatory and forestry, two years agricultural equipment sales, two years with forest industry. ***Instructor and Course Developer for ArcPad 7.0: Mobile GIS for Reclamation Mapping and Analysis. Instructor for Trimble GeoXT, TerraSync and PFOffice: Mobile Computing for Reclamation and GeoExplorer 3 GPS and PF Office: Advanced GIS Mapping for Reclamation.***

MARK BONAVENTURA

Office of the Attorney General, Columbus, OH, Assistant Attorney General, Environmental Enforcement; B.S., Business Administration, Ohio State University; J.D. cum laude, Capital University Law School; 27 years experience in litigating before administrative, State and Federal tribunals regarding the regulation of the coal mining industry and other civil actions. This work included appellate and bankruptcy practice as well as administrative practice under the Administrative Procedures Act. ***Instructor for Enforcement Procedures and Evidence Preparation and Testimony.***

GERALDINE BORRIELLO

U.S. Office of Surface Mining (OSM-AR); Environmental Protection Specialist; B.A., English; has 21 years experience with OSM; seven years experience with the IRS; two years experience with HUD. ***Instructor for Effective Writing and Master Instructor Forum.***

KEITH B. C. BRADY

Pennsylvania Department of Environmental Protection, Bureau of Mining and Reclamation, Registered Professional Geologist; Mineral Resources Program Manager; B.A., Geology, Alaska Methodist University, M.S., Quaternary Geology, University of Maine; has 27 years experience with the Bureau of Mining and Reclamation. ***Instructor for Geology and Geochemistry of Acid-Forming Materials.***

BRIAN J. BRADLEY

Pennsylvania Department of Environmental Protection, Division of Mine Hazards; Professional Geologist Manager; B.S., Geology, Juniata College, Huntingdon PA; Registered Professional Geologist in Pennsylvania; 16 years experience in Pennsylvania's AML and Bond Forfeiture Programs. ***Instructor for ArcView GIS.***

CHRISTINE J. BRAND

Kentucky Department for Surface Mining Reclamation and Enforcement, Field Services; Geologist; M.S., Western Michigan University, B.S., Calvin College, has 12 years with KY Dept. for Surface Mining, two years experience Teachers Assistant, Western Michigan University, three years laboratory teaching assistant, Calvin College. **Instructor for Acid-Forming Materials: AML Workshop and Acid-Forming Materials: Fundamentals and Applications.**

LESLIE N. BRIGHT

Virginia Department of Mines Minerals and Energy, Division of Mined Land Reclamation: Geologist; B.S., Geology; M.S., Environmental and Engineering Geology; six years of experience with DMLR's Technical Section in electronic permitting, complaint investigations, and AML. **Instructor for GPS for Mapping for Reclamation Using the Trimble GeoExplorer 3 and PF Office, Mobile GIS using ArcPad 7, and AML Design Workshop: Dangerous Openings.**

DOUG BROWN

West Virginia Division of Environmental Protection; Information Technology Office; GIS Analyst. **Instructor for ArcView GIS.**

TONYA BUCKMASTER

U.S. Office of Surface Mining, Western Region; Technology Coordinator, Office of Technology Transfer and TIPS Services; B.S., Environmental Analysis and Planning, Frostburg State University, Maryland; has six years experience with OSM as a physical scientist in the abandoned mine land program and 1.5 years as a technology coordinator under Technology Transfer. **Instructor and Course Developer for AutoCAD Fundamentals for Permitting and Reclamation, AutoCAD Map for Permitting and Reclamation, AutoCAD Map with Raster Design for Underground and Surface Mine Mapping, Advanced Carlson Mining for Permitting & Reclamation (SURVCADD), and Trimble GeoXT, TerraSync, and PF Office: Mobile Computing for Reclamation.**

PRISCILLA BURTON

Utah Department of Natural Resources, Soil Scientist, B.S., Soil Science, University of Maryland, M.S., Plant Science, Utah State University; ARCPACS Certified Professional Soil Scientist, ten years experience in coal mine permitting and reclamation. **Instructor for Soils and Revegetation.**

JULIAN CALABRESE

Montana Department of Environmental Quality, Industrial and Energy Minerals Bureau, B.S. Abused Land Reclamation, Montana State University, 5.5 years experience with state government, 1.5 years experience private environmental consulting. **Instructor and Course Developer for ArcPAD 7: Mobile GIS for Reclamation Mapping and Analysis.**

MARCELO CALLE

Wyoming Department of Environmental Quality, Abandoned Mine Land Division, Project Manager (2007–Present). B.S., Watershed Science, Colorado State University (2003); A.S., Natural Resource Management, Colorado Mountain College (2001); B.A., Anthropology, Ithaca College (1991). Coal and non-coal mine permitting and compliance, Wyoming Department of Environmental Quality, Land Quality Division (2003 thru 2007). **Instructor for ArcPAD 7: Mobile GIS for Reclamation Mapping and Analysis.**

WILLIAM C. CARD

U.S. Office of Surface Mining (OSM-AKTN); Geographer; B.S., Wildlife Management, Auburn University, M.S., Wildlife Sciences, Virginia Tech; 23 years experience in coal mining regulatory issues involving inspection, permitting, and GIS development. **Instructor of ArcInfo Workstation and ArcGIS Desktop.**

ROGER CALHOUN

U.S. Office of Surface Mining (OSM-ACWV) Field Office Director; B.S., Resource Management, West Virginia University, has over 30 years experience with the Department of the Interior and has served as the Director for three different Field Offices (Lexington KY, Indianapolis IN, and Charleston WV). **Instructor for Coalfield Communications.**

EDWARD F. CAREY

(Retired) U.S. Office of Surface Mining (OSM-AR); Physical Scientist; Ed.D., Science Education, Syracuse University; has 20 years experience with OSM, four years as a geologist with the U.S. Bureau of Mines and the U.S. Army Corps of Engineers. **Instructor for Instructor Training Course and Master Instructor Forum.**

NATALIE CARTER

U.S. Office of Surface Mining (OSM-ARCC-Beckley Area Office); Reclamation Specialist; B.S., Geology, University of Arkansas; M.S., Geology, Eastern Kentucky University; ten years experience with OSM. **Instructor for Principles of Inspection.**

TOM CARSTENSEN

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Office of Surface Mining, Mining Engineer for 23 years; B.S. Engineering of Mines, WVU; Maryland Bureau of Mines, three years; Industry, three years. ***Instructor and Course Developer for Advanced Blasting: Investigation and Analysis of Adverse Effects, Blasting and Inspection, Coalfield Communications, Blast Log Evaluation Program, and Introduction to GPS with Garmin eTrex Vista C.***

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Wyoming Department of Environmental Quality; Blasting Engineer. B.S. Geological Engineering 1975. Wyoming Registered Professional Geologist. Licensed blaster in Wyoming and Montana. Montana Certified Mine Foreman. Fifteen years industry experience in mine planning, operations, and blasting. Eighteen years with the State of Wyoming managing the blasting program as well as the reclamation bonding program. ***Instructor for Blasting and Inspection.***

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U.S. Office of Surface Mining Reclamation and Enforcement, Geographer. B.S. Chemistry, B.S. Land Use–GIS Emphasis, Metropolitan State College, Certificate Computer Programming, Certificate Network Support, United States Geological Survey, Chemist, 18 years, Rockwell International Rocky Flats Plant, Analytical Chemist, five years. ***Instructor and Course Developer for Introduction to ArcGIS for Mining and Reclamation, Image Analysis for ArcGIS, and E-Tools for Permitting and Reclamation.***

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MICHAEL GAULDIN

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CHARLES GAULT

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ROBERT GLENNON

U.S. Department of Agriculture, Natural Resources Conservation Service; Natural Resources Specialist; B.S., Rutgers University; M.F.R., Pennsylvania State University; 22 years experience as plant materials specialist, plant materials center manager, wetlands ecologist and national conservation program manager. ***Instructor for Soils and Revegetation and Wetlands Awareness.***

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U.S. Office of Surface Mining (OSM-WR); TIPS Hydrology Program Manager; B.A., Physical Geography, M.S. applied hydro-geography/physical science/statistics, Ph.D., hydrology/hydro-climatology, University of Delaware.; one year of experience with OSM, 18 years experience in applied environmental science studies, 15 years experience teaching hydrology, environmental science, climatology, meteorology, and statistics courses as university faculty at the University of Delaware and University of Colorado. ***Instructor for SEDCAD Applications and Extensions for Mine Permitting and Reclamation.***

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Illinois Department of Natural Resources, Office of Mines and Minerals, Division of Abandoned Mined Lands Reclamation, Northern Illinois Regional Manager; B.S., Landscape Architecture, Iowa State University; eight years experience as a consulting civil engineer and 22 years experience with the Illinois Abandoned Mined Lands Program dealing with a wide range of coal and hard rock reclamation projects. ***Instructor for AML Workshop: Dangerous Highwalls.***

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Navajo AML Reclamation Department, Navajo Nation Division of Natural Resources; Program Manager; B.S. degree in Civil Engineering Technology, Northern Arizona University; MBA degree, University of Phoenix; has eight years of work experience with AML Reclamation projects, two years in Highway Construction; five years in Public Works, and two years in geotechnical laboratory. ***Instructor for AML Reclamation Projects.***

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(Retired) Utah Department of Natural Resources, Division of Oil, Gas and Mining, Utah Coal Regulatory Program; Permit Supervisor; B.S., Mining Engineering, University of Utah; has 18 years experience with Utah DNR, eight years experience with private industry in hard rock mining. ***Instructor for Bonding Workshop: Administrative and Legal Aspects.***

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U.S. Office of Surface Mining (OSM-KFO) B.A., Geology, University of Tennessee, Registered Professional Geologist–Tennessee. Eight years supervisory experience for the Tennessee Valley Authority in soils and geotechnical engineering investigations; 18 years experience as geologist/hydrologist/reclamation specialist with OSM in Tennessee and West Virginia. ***Instructor for Applied Engineering Principles.***

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Utah Division of Oil, Gas and Mining; Permit Supervisor, B.S., Geology, Utah State University two years experience with Utah Division of Oil Gas and Mining, as mine inspector and 12 years permit supervisor, five years as a petroleum engineer in private industry. ***Instructor for Permit Findings Workshop.***

DAVID HAMILTON

U.S. Office of Surface Mining (OSM-AHPA), David Hamilton graduated from West Virginia University in 1973 with a Bachelor of Science Degree in Forestry. He spent the first few years of his career in the United States Department of the Interior's Bureau of Outdoor Recreation. He has 30 years experience with OSM. David joined the Office of Surface Mining in the summer of 1978, in the former Charleston West Virginia Regional Office. In 1982, he was reassigned to the Harrisburg Pennsylvania Field Office, and has worked in that office since. In recent years, David has served as OSM's Pennsylvania representative for the Watershed Cooperative Agreement Program (WCAP), and the Appalachian Regional Reforestation Initiative (ARRI). ***Instructor for Passive Treatment.***

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U.S. Office of Surface Mining, Technical Information & Professional Services (TIPS) Manager. BS, Colorado School of Mines, Geological Engineering. Twenty-five years experience with OSM, three years with engineering consulting firm, four years wilderness area studies for the U.S. Bureau of Mines. ***TIPS Manager, Instructor for Master Instructor Forum and Galena Slope Stability Analysis.***

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U.S. Office of Surface Mining (OSM-AR); Hydrologist, M.S., West Virginia University, B.S., Waynesburg College; OSM (1997–Present) as a mining hydrologist working with a variety of mining-related problems and teaching NTTP courses; U.S. Geological Survey, (1996–1997) National Water Quality Assessment Program; U.S. Bureau of Mines (1989–1996) Applied research into hydrology problems with surface and underground mines; PA Department of Environmental Resources (1985–1989) Permitting hydrologist for surface mining; Over 40 publications on research into mining hydrology problems; Registered Professional Geologist. ***Instructor for Underground Mining Technology, Subsidence and Forensic Hydrologic Investigations.***

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Railroad Commission of Texas, Surface Mining and Reclamation Division; Hydrologist; B.S., Chemical Engineering, Colorado State University, M.E., Environmental Engineering, Texas Tech University, three years of Texas mining engineering and hydrology experience with the Railroad Commission. ***Instructor for Design and Analysis of Impoundments, Channels and Structures Using SEDCAD.***

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U.S. Department of Agriculture, NRCS; state biologist; B.S., Forestry, Purdue University; 15 years experience as Pennsylvania State Biologist and five years experience as instructor for U.S. Army Corps of Engineer's Wetland Identification and Delineation (Regulatory IV). *Instructor for Soils and Revegetation and Wetlands Awareness.*

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Ohio Department of Natural Resources, Division of Mineral Resources Management, AML Emergency Program Administrator, B.S., Geology, Ohio State University; A.S., Construction Management, Columbus State Community College; nine years experience investigating complaints associated with abandoned coal mines and coordinating with OSM for eligibility and funding approval and seven years experience investigating ground water issues with the Division of Water. *Instructor for AML Drilling and Grouting.*

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U.S. Office of Surface Mining (OSM-WR); Mining Engineer; B.S., Mining Engineering, South Dakota School of Mines; has 18 years permitting experience with OSM, five years experience with MSHA as an underground coal ventilation engineer and coal mine inspector, 2000 Bonding Handbook Committee, Vice Chair CO Section of Society for Mining Metallurgy & Exploration, Past Chair Education Committee of SME; WOMEN IN MINING–Past President National organization & Denver Chapter; member MMSA; member Women's Mining Coalition. *Instructor for Underground Mining Technology.*

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KWANG “MIN” KIM

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RUSSELL KIRKHAM

Alaska Division of Mining, Land & Water, Geologist, MS Geology, University of Alaska Fairbanks. Six years experience in the mining industry as a geologist, three of those years with the Alaska Coal Program, Four years working for the Alaska Geological and Geophysical Surveys. *Instructor for ArcPad 7.0–Mobile GIS for Reclamation Mapping and Analysis.*

KATIE KIRKLAND

U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement (OSM), Applicant/Violator System Office; Investigations Specialist (Finance); B.A., Economics, University of Kentucky; with OSM since 2005, primarily focusing on financial matters involving alternative enforcement, bonding, and bankruptcy. *Instructor for Enforcement Tools and Applications and Bonding Workshop: Administrative and Legal Aspects.*

KEWAL K. KOHLI

U.S. Office of Surface Mining (OSM-AR); Mining Engineer; Ph.D., Mining Engineering; 18 years with OSM as an expert with all coal mining related issues, taught mining engineering courses at Colorado School of Mines, West Virginia University and West Virginia Tech.; Certified Professional Engineer; 20 years experience in underground coal mining operations and engineering. *Instructor for Underground Mining Technology and Subsidence.*

RUCHI KOHLI

U.S. Office of Surface Mining (OSM-HDQ), Abandoned Mine Land Program, Civil Engineer; University of Maryland, College Park; 19 years experience with OSM on environmental and regulatory policies involving dam safety, contemporaneous reclamation, blasting and the Clean Streams Program. *Instructor for Applied Engineering Principles.*

PAUL KRABACHER

Colorado Inactive Mine Program, State of Colorado; AML Project Manager; B.S., Biology, Colorado State University; 19 years experience with Colorado AML in Grand Junction; three years experience performing vegetation and wildlife baseline studies. *Instructor for AML Design Workshop: Dangerous Openings and Soils and Revegetation.*

ALLEN S. KRAPS

U.S. Office of Surface Mining (OSM-ACOH); Reclamation Specialist; B.S., Zoology, Ohio University; has 27 years experience with OSM, including: six years with the National Technical Training Division; ten years with the OSM-Indonesia Projects Office as an instructor; and seven years with the Bureau of Indian Affairs Water Resources Technician Training, as an instructor; three years experience in the Ohio Division of Reclamation. *Instructor for Instructor Training Course, Master Instructor Forum, Principles of Inspection, Enforcement Procedures, and Evidence Preparation and Testimony. Member of the OSM Instructor Advisory Council.*

MICHAEL LAMB

West Virginia Department of Environmental Protection, Charleston Headquarters; GIS Analyst, A.A.S. Computer Aided Design, West Virginia State University; has 17 years experience in natural resource mapping, natural gas, oil and coal, four years with the WVDEP. *Instructor for TIPS CAD courses.*

BRADLEY LAMBERT

Virginia Department of Mines, Minerals and Energy, Division of Mined Land Reclamation Division Director; B.S., Mined Land Reclamation, Lincoln Memorial University; Harrgote, TN; 32 years of mining experience with both industry and the Virginia mining reclamation program. *Instructor for Enforcement Procedures and Enforcement Tools and Application.*

RICHARD LAMKIE

Pennsylvania Department of Environmental Protection, Chief, Explosives and Safety Section; has 13 years experience in the mining industry and 13 years mining regulatory experience. *Instructor for Blasting and Inspection, Advanced Blasting: Investigation and Analysis of Adverse Effects, Instructor Training Course, Introduction to GPS with Garmin eTrex Vista C and Blasting Log Evaluation Program.*

DAVID E. LANE

U.S. Office of Surface Mining (OSM-AKTN); Civil Engineer; B.S., M.S., Civil Engineering, University of Tennessee; has 20 years experience with OSM, ten years experience with Tennessee Valley Authority; Registered Professional Engineer. ***Instructor for Bonding Workshop: Cost Estimation and Excess Spoil Handling and Disposal.***

ROBERT LIDDLE

U.S. Office of Surface Mining (OSM-AKTN); B.S., Environmental Resource Management water pollution control option at Pennsylvania State; graduate course work in Water Resource Science at University of Kansas; has eight years with State of Colorado and 18 years experience with OSM. ***Instructor for Water Quality Analysis Using AquaChem.***

THOR LINDQUIST

Illinois Dept. of Natural Resources, AML; Civil Engineer II, Project Manager; B.S., Mining Engineering, Southern Illinois University, Carbondale; has four months experience as Constructor Worker–Underground Coal Mine, Surveyor/Engineering Technician–Underground Coal Mine, three years experience as Inspector/Surveyor/Design–AML, six years experience in SurvCADD and ACAD; ***Instructor for AML Workshop: Dangerous Highwalls.***

JOHN MACK

U.S. Office of Surface Mining (OSM-AWBPA); B.S., Mining Engineering, Masters in Business Administration, has 4.5 years with Pennsylvania Bureau of Abandoned Mined Land. ***Instructor for AML Design Workshop: Dangerous Openings and AML Design Workshop: Subsidence.***

STEPHEN MAHONEY

U.S. Department of the Interior, Office of the Field Solicitor, Pittsburgh; Staff Attorney; B.A., General Studies, University of Central Florida; J.D., Stetson University; has 11 years experience with DOI, two years experience with the Florida State Attorney's Office, and one year experience in general litigation with a Florida law firm. ***Instructor for Evidence Preparation and Testimony, and Expert Witness.***

LUCIA MALIN

Utah Department of Natural Resources, Division of Oil, Gas and Mining, Abandoned Mine Reclamation Program; Environmental Scientist B.A., Geography, University of California, Berkeley, M.S., Range Management, University of California, Davis; has 23 years experience with Utah DNR, two years with Oregon State University–Extension Service; five years field crew work with BLM and NPS. ***Instructor for NEPA Procedures and Coalfield Communications.***

BILL MANGOLD

(Retired) Indiana Department of Natural Resources; Archaeologist; B.S., Education; M.A., Anthropology/Archaeology and American Studies/Material Culture; has 32 years experience in archeology; nine years experience with Indiana Division of Reclamation and two years with the Division of Historic Preservation and Archaeology. ***Instructor for Historical and Archeological Resources.***

RICHARD MANN

U.S. Office of Surface Mining (OSM-AKTN), Technical Group; B.S., Geology, Middle Tennessee State University, M.S., Geology, University of Memphis; has 22 years experience with OSM along with two years with the Tennessee Division of Surface Mining as both a Geologist and Hydrologist. ***Instructor for CAD Applications and Autodesk Map.***

TOM MASTALLER

U.S. Office of Surface Mining (OSM-AR); Mining Engineer; B.S., Mining Engineering, University of Pittsburgh; has 20 years experience with OSM and two years experience with the U.S. Bureau of Mines as a mining engineer. ***Instructor for Applied Engineering Principles, GPS for Mapping for Reclamation Using the Trimble GeoExplorer 2 and PF Office, Advanced GPS Mapping for Reclamation Using the Trimble GeoExplorer 3 and PF Office, Real-Time Corrected GPS for Reclamation Using the Trimble Pro XRS and PF Office, CAD Applications for permitting and Reclamation, AutoCAD Map for Permitting and Reclamation, and SurvCADD for Reclamation and Permitting.***

THOMAS V. MASTROROCCO

U.S. Office of Surface Mining (OSM-AR); Physical Scientist; B.S., Natural Science (Geology), University of Pittsburgh at Johnstown; M.S., Environmental Geology, West Virginia University; has three years experience with OSM, six years experience with Defense Mapping Agency (now NIMA) and seven years in municipal government and private consulting. ***Instructor for GIS Workstation-Mining and Reclamation, and ArcView GIS.***

DUANE MATT

U.S. Office of Surface Mining Reclamation and Enforcement—Physical Scientist/Technology Coordinator (1.5 years). U.S. Office of Surface Mining Reclamation and Enforcement—Reclamation Specialist (six years). Private industry—one year as a geologist and numerous years of experience with other governmental agencies in the field of fire control. M.S. Geology—Montana Tech School of Mines; B.S. Geology—University of Montana; B.S. Secondary Education/English—University of Montana. ***Instructor for Principles of Inspection, Effective Writing, and Galena Slope Stability Analysis.***

JOSEPH P. MATYUS

Pennsylvania Department of Environmental Protection, California District Office; Geologic Specialist. B.A. in Education (Earth Sciences) California University of Pennsylvania, M.S., Earth Sciences, California University of Pennsylvania. Nine years of experience with U.S.S. Mining, Inc., Geology and Environmental Control support; 17 years with Consol Energy, Geology and Engineering support, five years experience with the Pennsylvania Department of Environmental Protection, Geologic Specialist, underground mine permitting section. ***Instructor for AutoCad Fundamentals for Permitting and Reclamation; and, Advanced Carlson Mining for Permitting and Reclamation (SURVCADD).***

HEATHER MCDONALD-TAYLOR

Virginia Department of Mines, Minerals and Energy, Reclamation Inspector, B.S., Biology, Emory and Henry College; M.S., Biology, East Tennessee State University; attended Dave Rosgen's Applied Fluvial Geomorphology, River Morphology and Applications, River Assessment and Monitoring, and River Restoration and Natural Channel Design courses; has five years experience in environmental permitting with emphasis on mitigation design and implementation and two years experience as reclamation inspector. ***Instructor for Wetlands Awareness.***

JACK MCGRIFFIN

Indiana Department of Natural Resources, Division of Reclamation; special projects, program reports, communication and outreach, Web Coordinator, and trainer; has 30 years various modes of public relations, legislative reviews, policy development and public interaction; most recently devoted to agency-wide strategic planning, designing and facilitating public meetings and developing various forms of internal and external communications. ***Instructor for Coalfield Communications.***

MARK A. MEADE

Kentucky Department for Surface Mining, Reclamation, and Enforcement, Division of Abandoned Lands; Construction Branch; Environmental Technologist III; B.S., Agronomy, University of Kentucky; has 17 years experience with the Kentucky Division of AML. ***Instructor for AML Reclamation Projects and Soils and Revegetation.***

BRENT MEANS

U.S. Office of Surface Mining (OSM-HPA), Hydrologist; M.S., Hydrogeology, Wright State University; has two years experience with OSM, two years of ground water experience with USGS, and one year of experience in coal mining consulting. ***Instructor for Passive Treatment, Modeling and Analysis with Groundwater Vistas, and Testing and Analysis of Aquifers Characteristics with AQTESOLV.***

LEONARD V. MEIER

U.S. Office of Surface Mining (OSM-MCR); Physical Scientist; M.S., Conservation Biology, University of Missouri, St. Louis; B.S., Agriculture from Southwest Missouri State University; has 20 years experience in abandoned mine reclamation and resource protection with OSM and MO Department of Natural Resources. ***Instructor for Acid-Forming Materials: AML Workshop and AML Design Workshop: Dangerous Openings.***

BECKY MEYER

Indiana Geological Survey, Database/GIS Analyst, B.S., Forestry, Purdue University, MPA, Indiana University, 20 years of programming and database experience, six years experience with the Indiana Coal Mine Information System. ***Instructor and Course Developer for Underground Mine Mapping with GIS.***

PETER MICHAEL

U.S. Office of Surface Mining (OSM-AR); Geologist; B.S., Geology, Rider College; M.A., Geology, State University of New York—Binghamton; graduate courses in Geotechnical Engineering, University of Pittsburgh; licensed professional geologist in Pennsylvania; has 20 years experience in geotechnical investigations and project management with OSM and four years experience in landform mapping with the U.S. Peace Corps. ***Instructor for Excess Spoil Handling and Disposal.***

STUART MILLER

Missouri Department of Natural Resources, Abandoned Mine Land Program; Technical Assistance Coordinator and Soil Scientist; B.S. and M.A., University of Missouri, Forest Soils and Ecology, Environmental History; three years as soil scientist NRCS and ten years experience with Missouri AML. ***Instructor for Acid-Forming Materials: AML Workshop, Acid-Forming Materials: Fundamentals and Applications, and Acid-Forming Materials for Program Staff.***

THOMAS (RUSS) MILLER

U.S. Office of Surface Mining, (OSM-MCIND); Program Specialist; B.S., M.S., Agronomy, Purdue University; 27 years experience with OSM/AML and eight years experience with the Indiana State Planning Agency as an environmental planner. ***Instructor for AML Reclamation Projects, Effective Writing, and NEPA Procedures.***

RANDALL MILLS

U.S. Office of Surface Mining (OSM-MCR); Mining Engineer, B.S., Geology, University of Georgia, Athens, Georgia; six years experience with OSM; has 21 years experience in underground coal mining with Jim Walter Resources, Inc., AL and three years with Core Laboratories, Inc., OK; Alabama Mine Foreman Certification, Alabama Licensed Professional Geologist. ***Instructor for Subsidence and Underground Mining, and AutoCAD and SurvCADD.***

LUKUS MONETTE

U.S. Office of Surface Mining; Remote Sensing Specialist, B.S., Geography (GIS), Clarion University, two years experience with OSM in current role; six months as a Geographer with the NMMR; ten years experience with GIS, remote sensing, GPS, and mobile computing with the U.S. Army. ***Instructor and Course Developer for Image Analysis for ArcGIS.***

RODNEY A. MOORE

U.S. Office of Surface Mining (OSM-AMWV); Reclamation Specialist; BSF, Forest Resources Management, West Virginia University; has 26 years experience with OSM. ***Instructor for Enforcement Procedures and Evidence Preparation and Testimony.***

KATHY MULLER OGLE

Geological Supervisor with Wyoming Department of Environmental Quality for six years. Previously employed by the U.S. Geological Survey for 12 years as a groundwater specialist and hydrologist with additional experience at a consulting firm and a mining company. Education includes B.S., Montana State University and a M.S., Hydrology, New Mexico School of Mining and Technology. Experience with groundwater, surface water, CHIAs, and hydrology databases. ***Instructor for Modeling and Analysis with Groundwater Vistas.***

DOUGLAS S. MULLINS

Virginia Department of Mines, Minerals and Energy; Engineer Technician; B.S., Environmental Science, University of Virginia's College at Wise; has three years experience with Virginia's AML Program as a geologist and four years experience with Virginia's Mined Land Reclamation Program developing and maintaining Geographic Information Systems. ***Instructor for CAD Applications for Permitting and Reclamation and AutoCAD Map for Permitting and Reclamation.***

RAUL MURGUIA

U.S. Office of Surface Mining (OSM-AR), Technical Support Division, Civil Engineer; B.S., Civil Engineering, University of Texas; MBA, University of Autonoma de Chihuahua; Masters Certificate in Project Management, George Washington University, School of Business; 20 years experience in construction management, project management, private industry and seven years experience with OSM in mining reclamation. ***Instructor for Applied Engineering Principles.***

MITTIE C. MUSE SR.

Texas Railroad Commission; Environmental Quality Scientist IV; B.S., Plant and Soil Science, Southern University, graduate work with Stephen F. Austin University; has 15 years experience with Texas Railroad Commission, six years experience with the Soil Conservation Service (now NRCS) and 20 years as an AME minister; Certified Professional Soil Scientist. ***Instructor for Erosion and Sediment Control and Soils and Revegetation.***

WILLIAM G. O'LEARY

Illinois Department of Natural Resources, Land Reclamation Division, Wildlife and Wetlands Specialist, B.S., Biology/Environmental Biology, Indiana State University, M.A. Zoology/Wildlife Management, Southern Illinois University; has 21 years experience with SMCRA wildlife issues with Southern Illinois University, consultant for OSM, and State of Illinois. **Instructor for SMCRA/ESA and Wetlands.**

DIANNE OSBORNE

U.S. Office of Surface Mining, Remote Sensing Specialist, B.S., Wildlife Biology, Colorado State University, three years experience with OSM and 28 years experience with remote sensing. **Course Developer and Instructor for Image Analysis for ArcGIS.**

NANCY OSBORNE

U.S. Office of Surface Mining; Information Technology Specialist, B.S., Mathematics & A.S., Computer Science, West Virginia State University, GIS Certificate, University of Montana, 20 years experience with OSM. **Instructor and Course Developer for ArcPad 7.0: Mobile GIS for Reclamation Mapping and Analysis.**

BEN OWENS

U.S. Office of Surface Mining (OSM-HDQ); B.A., Journalism, Iowa State University, MBA, Boston University, M.S., Military Science, Marine Corps University, M.A., Journalism (Public Affairs), University of Maryland; 30 years experience as a journalist and public affairs including Spokesman for the Office of the Secretary of Defense. Currently OSM's press officer; **Instructor for Coalfield Communications.**

PATRICK C. PARK

West Virginia Division of Environmental Protection, Abandoned Mine Lands and Reclamation; Assistant Chief; B.S., Mathematics, West Virginia State College; has over 35 years experience with the West Virginia Division of Environmental Protection; Past President of the National Association of Abandoned Mined Land Program (1999/2000, 2000/2001). **Instructor for AML Reclamation Projects and Master Instructor Forum.**

ERIC F. PERRY

U.S. Office of Surface Mining (OSM-AR); Hydrologist; B.S., Plant and Soil Science, M.S., Soil Science, West Virginia University, Ph.D. studies in Hydrogeology; has 20 years experience with the OSM and five years experience with a consulting firm. **Instructor for Acid-Forming Materials: Fundamentals and Applications, Geology and Geochemistry of Acid-Forming Materials, Acid-Forming Materials for Program Staff, Instructor Training Course, and Statgraphics Plus for Windows.**

DAVID PHILBIN

U.S. Office of Surface Mining (OSM-AWBPA); Mining Engineer; B.S., Mining Engineering, Pennsylvania State University; has 13 years experience with OSM and 11.5 years experience with the U.S. Bureau of Mines. **Instructor for AML Drilling and Grouting, AML Design Workshop: Fires, and Underground Mining Technology.**

NANCY POINTON

U.S. Office of Surface Mining; Hydrologist, B.S., Geology, University of Pittsburgh, two years experience with OSM at the Appalachian Regional Office; ten years working with the Power Industry, 12 years with Pennsylvania State Regulatory Agency in both mining and waste programs and two years consulting experience. **Instructor for AMD Treat, Permitting Hydrology, and Surface and Groundwater Hydrology.**

DANIEL POLLOCK

U.S. Office of Surface Mining (OSM-AR); Senior Projects Manager (Subsidence); A.A.S., Natural Resource Conservation, SUNY at Morrisville; B.S., Forest Resource Management, West Virginia University; has 24 years experience with OSM, including 20 years in the AML emergency and high priority program and four years experience as a Reclamation Specialist Inspector. **Instructor for AML Design Workshop: Subsidence.**

JOEL PONTORERO

Pennsylvania Department of Environmental Protection (PADEP), Greensburg District Mining Office; District Mining Manager; 28+ years experience with PADEP mining regulatory program; 6.5 years experience in coal mining industry; five years experience as cartographic draftsman. **Instructor for Principles of Inspection.**

GEORGE POPPER

U.S. Office of Surface Mining (OSM-AR); Project Manager/Geologist; B.S., Geology, CUNY; M.S., Geology, University of Massachusetts; Ph.D., Geology, Lehigh University; has 18 years with OSM (AML emergencies), two years with U.S. Bureau of Mines (commodities), five years with Bendix Field Engineering (uranium), two years with Israeli Geological Survey (subsurface studies), teaching at Eastern Connecticut State College; Dickinson College; CUNY. **Instructor for AML Design Workshop: Dangerous Openings.**

ROBERT C. POSTLE

U.S. Office of Surface Mining (OSM-WR); Ecologist; B. S., Environmental Biology, University of Montana; M.S., Land Rehabilitation, Montana State University; has 13 years experience with OSM; two years experience with the Hopi Tribe and two years land rehabilitation research experience. **Instructor for Statgraphics Plus for Windows.**

HAROLD (HAL) S. PRANGER, II

U.S. Office of Surface Mining (OSM-WR), Hydrologist, B.S., Geology, Calvin College; M.S., Geology, Colorado State University, 22 years experience as a hydrologist and/or geomorphologist for OSM, the National Park Service, two consulting firms and the state of Wyoming. **Course Developer for on-line Geomorphic Principles for Surface Mine Reclamation.**

BEN QUINONES

Montana Department of Environmental Quality; Mine Waste Cleanup Bureau; Abandoned Mines Section; Abandoned Mine Reclamation Project Manager; B.S., Microbiology/Minor in Chemistry and M.S., Environmental Health/Epidemiology, Colorado State University; has 14 years experience with AML program. **Instructor for AML Design Workshop: Fires.**

DANNY RAHNEMA

U.S. Office of Surface Mining (OSM-AKTN); Civil Engineer; M.S., Environmental Engineering University of Tennessee; has 18 years experience with OSM and six years experience with Tennessee Department of Conservation and Environment. **Instructor for Surface Deformation Prediction System (SDPS) and SEDCAD Applications for Mine Permitting and Reclamation.**

HARRY RANNEY

Colorado Division of Minerals and Geology (DMG); Environmental Specialist; B.S., Mathematics, Western State College; M.S. Ed., University of Southern California; has 14 years experience with the Division of Minerals and Geology, 12 years U.S. Air Force, three years Pierce College math/physics, faculty, three years Embry Riddle Aeronautical University mathematics faculty and five years secondary school instruction. **Instructor for AutoCAD & SurvCadd for Permitting and Reclamation and Galena Slope Stability Analysis.**

JAMES E. RATCLIFF

WV Department of Environmental Protection, Office of Explosives and Blasting (WVDEP-OEB); Assistant Chief, B.S., Mining Engineering, WV Institute of Technology, has four years experience with OEB in regulatory and blaster certification programs and 25 years experience in the mining, engineering, and explosives industry. **Instructor for Blasting and Inspection and Advanced Blasting: Investigation and Analysis of Adverse Effects.**

GREG REED

U.S. Bureau of Reclamation; Wildlife Biologist; B.S., University of Tennessee; has 15 years experience with OSM as a Reclamation Specialist and Wildlife Biologist; five years experience with Tennessee Valley Authority as a Biologist and six years with the Bureau of Reclamation as a Natural Resource Specialist. **Instructor for Wetlands Awareness.**

MIKE REESE

West Virginia Division of Environmental Protection, Office of Mining & Reclamation - Small Operators Assistance Program Administrator, Office AML & Reclamation; Civil Engineering degree, West Virginia Institute of Technology; Mining Engineering degree, West Virginia University; has nine years experience with West Virginia, 20 years associated with coal industry in the design and development of surface and underground coal mines, and 15 years associated with industry in the operation, design, and development of surface and underground limestones, clay, and gravel mines, etc. **Instructor for Excess Spoil Handling and Disposal.**

STEVE RENNER

Colorado Division of Minerals and Geology; Environmental Protection Specialist; B.S., Geology, Mesa State College, Colorado; has 14 years of regulatory and Abandoned Mined Land Reclamation experience. **Instructor for AML Design Workshop: Fires, Erosion and Sediment Control, and Wetland Awareness**

MIKE RICHARDSON

U.S. Office of Surface Mining (OSM-AAO); B.S., Mining Engineering technology, West Virginia Institute of Technology; has 17 years experience with the AML program in project inspection and design of emergency reclamation projects. **Instructor for AML Design Workshop: Landslides.**

MIKE RICHMOND

U.S. Office of Surface Mining (OSM-CHFO); Civil Engineer, B.S., West Virginia Institute of Technology, two years experience with OSM, 16 years consulting. **Instructor for Excess Spoil Handling.**

JAY SCOTT ROBERTS

Pennsylvania Department of Environmental Protection; Office of Mineral Resources Management, Deputy Secretary, B.A., Historical Archeology, California University of Pennsylvania, B.S., Geology, University of Pittsburgh; has 18 years experience with Pennsylvania Department of Environmental Protection. **Instructor for Geology and Geochemistry of Acid-Forming Materials and Acid-Forming Materials Workshop for Program Staff.**

NANCY ROBERTS

U.S. Office of Surface Mining (OSM-ACWV); Physical Scientist; B.S., Forestry, West Virginia University; has over 25 years experience with OSM with more than 20 years as AML Project Manager; in the Emergency Program. **Instructor for AML Reclamation Projects, AML Design Workshop: Fires, AML Design Workshop: Landslides, Erosion and Sediment Control, and Instructor Training Course.**

MICHAEL ROBINSON

U.S. Office of Surface Mining (OSM-AR); B.S., Geology, Marshall University; has more than 28 years experience in OSM in program and technical assistance, TIPS, training, and technology transfer and over six years with West Virginia regulating dams and coal waste impoundments/embankments. **Instructor for Coalfield Communications.**

JOSHUA S. ROCKWELL

U.S. Office of Surface Mining; Mining Engineer, B.S., Engineering of Mines, West Virginia University, eight years of Federal Service, three years with OSM Headquarter's Division of Regulatory Support, five years as a Facility Engineer with the Department of Veteran Affairs, four years working for the coal mining industry focused on production engineering and business development, past president of WVU's Mineral Resources Alumni Chapter, past president of WVU's student chapter of SME, Eagle Scout. **Instructor for SDPS: Surface Deformation Prediction System. Course Developer for on-line SDPS: Surface Deformation Prediction System.**

MICHAEL F. ROSENTHAL

U.S. Office of Surface Mining (OSM-WR); Mining Engineering; B.S., Physics/Mathematics, West Virginia Institute of Technology; M.S., Mining Engineering, West Virginia College of Graduate Studies; has 20 years experience with OSM, eight years experience as a drilling/blasting foreman and blast vibration consultant, and three years experience as a West Virginia state inspector. **Instructor for Blasting and Inspection and Advanced Blasting: Investigation and Analysis of Adverse Effects.**

DAN SAMMARCO

Pennsylvania Department of Environmental Protection; Bureau of Abandoned Mine Reclamation; Mining Engineer; Chief-Planning, Development & AMD Operations Unit for the PADEP/Cambria Office B.S., Mining Engineering, Penn State University; MBA, Indiana University of PA; has 19 years experience in designing abandoned mine reclamation type projects including passive wetland treatment and 3.5 years experience in Underground coal mining industry. **Instructor for AML Design Workshops: Dangerous Highwalls, Acid-Forming Materials Workshop for Program Staff, Passive Treatment and Underground Mining Technology.**

ANTHONY SCALES

Virginia Department of Mines, Minerals and Energy, Division of Mined Land Reclamation; Mineral Specialist I-Geologist; B.A., M.S., Geology, University of Tennessee; has 23 years experience as a geologist, two years experience as a reclamation inspector; Certified Professional Geologist. **Instructor for Acid-Forming Materials: AML Workshop, Acid-Forming Materials: Fundamentals and Applications, and Underground Mining Technology.**

NICK SCHAER

West Virginia Department of Environmental Protection/ Division of Mining and Reclamation (Title IV), Program Development Geologist, B.S., Geology, The Ohio State University; has 19 years experience in mining related geology, hydrogeology and regulation and worked for over ten years with GIS and GPS technologies. **Instructor for ArcPAD 7: Mobile GIS for Reclamation Mapping and Analysis and Passive Treatment.**

STEFANIE SELF

Civil/Mining Engineer, Technical Services Branch, Program Support Division, Office of Surface Mining's Mid-Continent Region Office, Alton, Illinois. B.S. in Mining & Minerals Engineering with minors in Environmental Science & Geological Sciences from Virginia Polytechnic Institute & State University. **Instructor for AutoCAD Fundamentals for Permitting and Reclamation, AutoCAD Map for Permitting and Reclamation, AutoCAD Map with Raster Design for Underground and Surface Mine Mapping, Carlson Mining for Permitting and Reclamation (SURVCADD), and Advanced Carlson Mining for Permitting and Reclamation (SURVCADD).**

KIMBERLY SEYMOUR

Colorado Department of Natural Resources; Grants Officer, B.A., Liberal Studies, California State University, Fullerton, Certificate in Paralegal Studies; has three years experience with Colorado Abandoned Mined Land Program. **Instructor for Financial and Business Management System.**

J. MICHAEL SHAPAKA, JR.

U.S. Office of Surface Mining (OSM-AAKY); Civil Engineer, B.S. Mining Engineering, West Virginia University; has 16 years experience in deep mines, 13 years private practice in general engineering and land surveying, five years in AML emergency program as a design engineer; Licensed Professional Engineer (Mining) and Professional Land Surveyor (Kentucky). **Instructor for AML Design Workshop: Landslides and Underground Mining Technology.**

MIKE SHARP

Oklahoma Conservation Commission, AML Program Assistant Director; B.S., Animal Science, Ph.D., Biochemistry and Animal Nutrition; Oklahoma State University; has eight years experience with AML Program. **Instructor for AML Design Workshop: Dangerous Highwalls, GPS for Reclamation Mapping, CAD Applications for Permitting and Reclamation, and AutoCAD Map for Permitting and Reclamation.**

COURTNEY W. SHEA

U.S. Department of the Interior, Office of the Field Solicitor, Knoxville, Assistant Field Solicitor; B.A., Psychology, J.D., University of Connecticut; has 18 years experience with the Solicitor's Office in all aspects of SMCRA. **Instructor for Enforcement Procedures, Evidence Preparation and Testimony, and Expert Witness.**

MICHAEL SHEEHAN

West Virginia Department of Environmental Protection; Environmental Resource Specialist; B.S., Environmental Protection w/Minors in Civil Engineering and Chemistry; has six years experience with AML dealing with Passive Treatment Systems and four years experience with Office of Special Reclamation (Bond Forfeitures) dealing with active treatment systems. **Instructor for Passive Treatment.**

FREDERICK C. SHERFY

U.S. Office of Surface Mining (OSM-AHPA); AML Program Specialist; B.S., Wildlife Management, West Virginia University; M.S., Wildlife Resources Management, Frostburg State College, University of Maryland; has 26 years experience with OSM in regulatory and AML programs. **Instructor for NEPA Procedures.**

WILLIAM SHUSS

Pennsylvania Department of Environmental Protection, District Mining Operations; Blasting and Explosives Inspector. B.S., Pennsylvania State University. Thirty years experience with Surface Coal Mining, 15 years as an Explosives Regulator. **Instructor for Blasting and Inspection.**

ANN SINGLETON

U.S. Office of Surface Mining (OSM-ALKY-AVS); Program Specialist, Applicant/Violator System Office; B.A., English, University of Maryland; has 18 years experience with OSM, 15 years experience with the AVS Office. **Instructor for Enforcement Tools and Applications.**

MICHAEL W. SMITH

Pennsylvania Department of Environmental Protection, District Mining Operations; Mining Manager; B.A., Geology, Susquehanna University; M.S., Geology, Pennsylvania State University; has 17 years experience with the Pennsylvania Department of Environmental Protection. **Instructor for Acid-Forming Materials for Program Staff, Permit Findings Workshop, Permitting Hydrology and Surface and Groundwater Hydrology.**

JENNIFER CABLE SMOCK

Kentucky Natural Resources and Environmental Protection Cabinet; Staff Attorney III; B.A., Political Science, University of Kentucky, J.D., University of Kentucky; has 12 years experience with Cabinet's Office of Legal Services; representing the Cabinet's Department for Surface Mining Reclamation and Enforcement in enforcement and permitting matters. *Instructor for Enforcement Procedures, Evidence Preparation and Testimony, and Expert Witness.*

S. BRAD SMOCK

Kentucky Natural Resources and Environmental Protection Cabinet, Office of Legal Services; Attorney III; B.A., American Studies and English; Georgetown College, J.D., University of Kentucky; has 15 years experience with Kentucky's Department for Surface Mining Reclamation and Enforcement prosecuting enforcement actions and defending permitting and other determinations. *Instructor for Enforcement Procedures, Enforcement Tools and Applications, Evidence Preparation and Testimony, Expert Witness, and Permit Findings Workshop.*

CHERYL H. SOCOTCH

Ohio Department of Natural Resources, Mineral Resources Management (ODNR-MRM), New Philadelphia, OH; Hydrologist; B.S., Env't Geography/Geology, Ohio University; has over 23 years experience with ODNR-MRM in coal regulatory, industrial minerals and AML-AMD programs. *Instructor for Forensic Hydrologic Investigations and Surface and Groundwater Hydrology.*

DEAN SPINDLER

Illinois Department of Natural Resources, Land Reclamation Division, Soil Scientist/Geologist, B.S., Geology; M.S., Soil Science; has 27 years experience with LRD as soil scientist, geologist, manager of GIS and Bond Release Program and eight years experience teaching geology in the community college. *Instructor for Permit Findings Workshop.*

DIANA J. STARES

Pennsylvania Department of Environmental Protection (PADEP); Chief, Southwest Regional Office of Chief Counsel; J.D., Duquesne University of Law; has 18 years experience with DEP. *Instructor for Enforcement Procedures, Evidence Preparation & Testimony, and Expert Witness.*

JAMES STARK

Colorado Division of Reclamation, Mining and Safety, Denver; Environmental Protection Specialist; B.S., Chemistry, University of Colorado-Boulder; has ten years experience with DRMS and seven years experience with the Colorado Department of Public Health and Environment. *Instructor for Bonding Workshop: Cost Estimation.*

BRENDA A. STEELE

U.S. Office of Surface Mining (OSM-WR); Hydrologist; B.S., Geology, University of Wisconsin-Platteville; M.S., Geology, Colorado School of Mines; has 17 years experience with OSM and ten years experience with the U.S. Geological Survey. *Instructor for Surface and Groundwater Hydrology.*

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West Virginia Department of Environmental Protection, Office of Special Reclamation, Environmental Resources Specialist II; Southern West Virginia Community College, B.S., Mine Technology; was the Safety Director for a coal company and Safety Instructor for West Virginia Department of Mines; conducted inspection and enforcement activities and special reclamation activities on abandoned mine lands addressing past mine reclamation problems. ***Instructor for AML Design Workshop: Dangerous Highwalls and Wetlands Awareness.***

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Railroad Commission of Texas, Surface Mining and Reclamation Division, Abandoned Mined Land Program (RCT-SMRD-AML); Engineering Specialist; B.A., Geography, University of Texas at Austin; has eight years experience with the Railroad Commission of Texas performing AML reclamation design. *Instructor for CAD Applications for Permitting and Reclamation and SurvCADD for Reclamation and Permitting.*

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