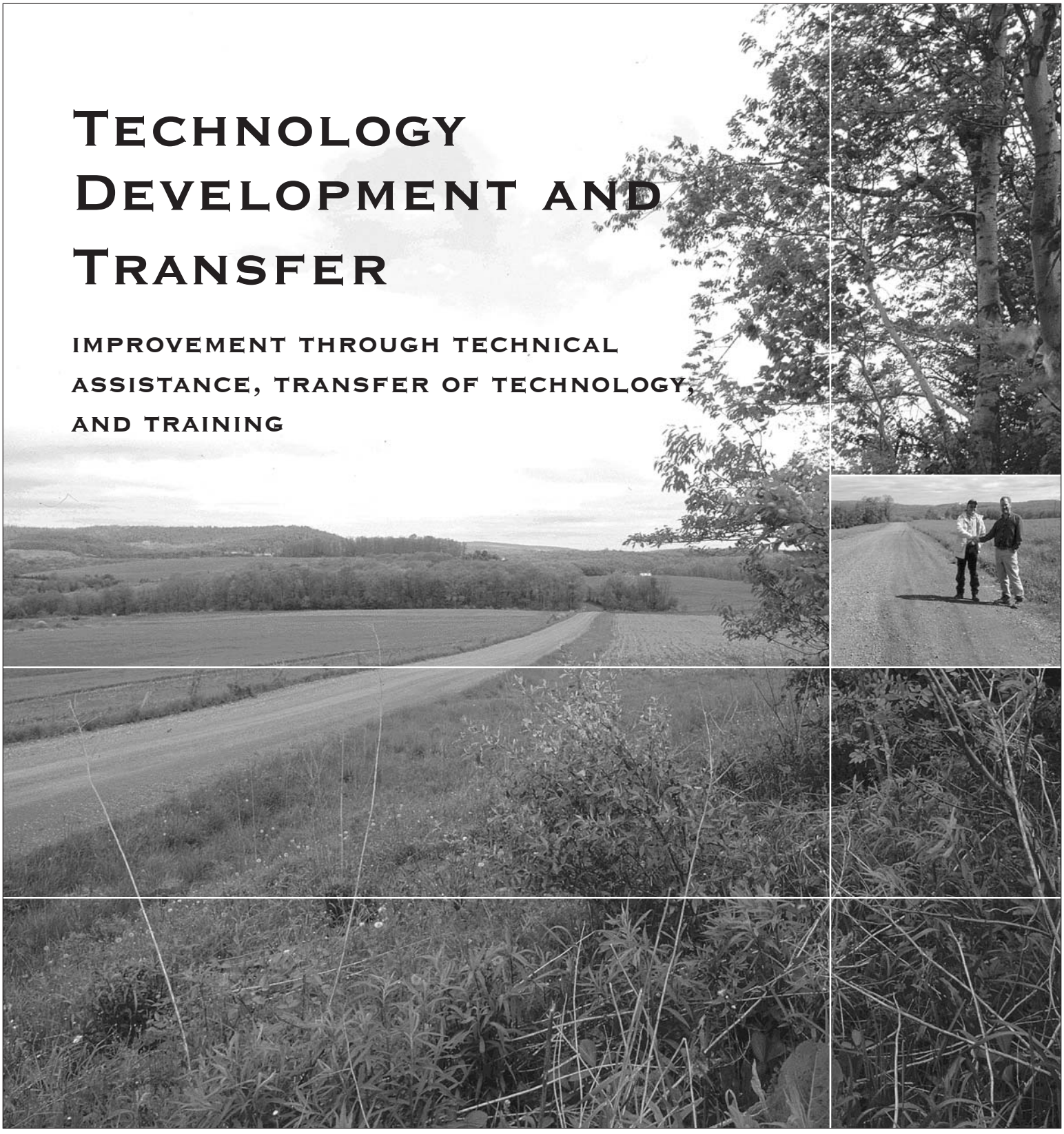
Technology Development and Transfer

improvement through technical assistance, transfer of technology, and training



The Office of Surface Mining provides states, Indian tribes, federal agencies, and the coal industry with the technical information and tools they need to carry out their responsibilities under the Surface Mining Law. These activities include:

- providing direct *technical assistance* to address specific mining and reclamation problems;
- maintaining automated *systems and databases* used by others in making decisions under the Surface Mining Law; and
- transferring technical capability to others through *training, consultations, forums, and conferences.*

The goal is to help them develop the skills needed for solving problems on their own. In recent years, the Office of Surface Mining has been supplementing its traditional oversight presence with an increased emphasis on providing technical assistance and support to states and tribes.

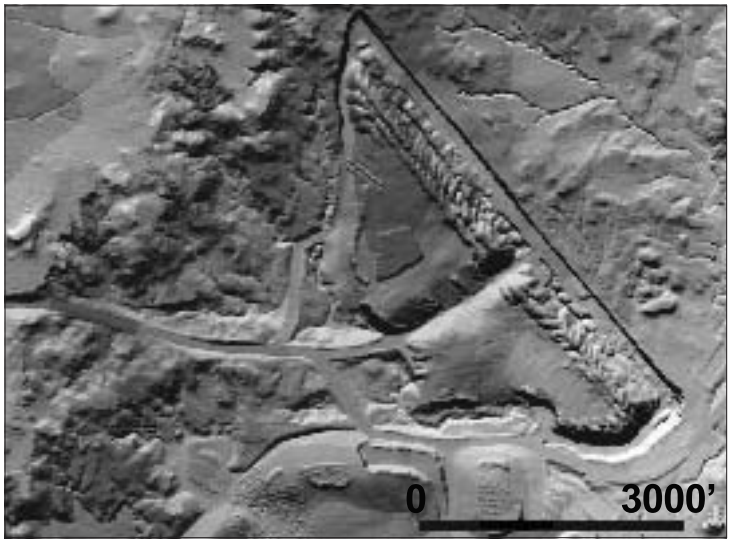
While the focus of the Office of Surface Mining is to help state and tribal partners do their jobs, the ultimate goal is to improve the health, safety, and the environment for our primary customers—the people who live and work in coalfield communities. Using printed publications, website information, and videos, the Office of Surface Mining provides information to citizens to help them better understand their rights and responsibilities under the Surface Mining Law.

Technical Assistance

Computer Tools and Services

The Office of Surface Mining provides states regulators with a comprehensive set of analytical tools to aid in technical decision-making related to the Surface Mining Law. The services provided are centered on off-the-shelf scientific and engineering computer hardware and software supported by the Office of Surface Mining in partnership with the states and tribes. This technical assistance has grown from a few applications available on a single specially designed shared workstation, to a suite of software on each user's desktop computer. Costs are held low through shared licensing of the software via the Internet.

Currently the assistance consists of Windows-based computers at state, tribal, and Office of Surface Mining offices with access to the licensed servers via the Internet and Office of Surface Mining Wide Area Network. The 19 commercially available software applications cover a wide range of regulatory and Abandoned Mine Land subjects.



High Resolution Airborne LIDAR data is used at the active surface coal mine to map topography. In this hill-shaded example, many details about the mining operation can be seen including regraded areas, topsoil stockpiles, spoil ridges, and the location of the active highwall. The LIDAR data is used to perform accurate volumetric analysis to verify bond compliance, surface water hydrologic flow, and volumes of topsoil. The Office of Surface Mining has used this data to support regulatory action at four western mines and to do abandoned mine land design work at five sites in Oklahoma.

(Left) Mining and reclamation at this Pennsylvania site between 1988 and 2000 resulted in outstanding reclamation and interaction between the company and community. Working closely with Jack Lewis, Warton Township Supervisor the mining company made many long-term improvements to the community. At this location a dangerously twisting township road was reconstructed to a safe reasonably straight road. Being a good neighbor to this mining company has included being part of the community and helping just the way neighbors do everyday.

During 2003, on average 115 customers use software provided by Technical Innovation and Professional Services each workday. The customer base is composed of over 700 desktop computers at 44 state, tribal, and Office of Surface Mining offices throughout the country. In 2003, personnel provided 7 software updates to each of the 44 customer sites as part of a semiannual service to keep the software tools up to date.

Remote Sensing Technology

In the western region, aerial and satellite imagery are an integral part of the regional geographic information system with quarterly updates acquired, processed, and provided to permitting and inspection staff. The inspectors routinely use this imagery to plan field visits, during consultations with mine operators, and when preparing maps for inspection reports.

The Office of Surface Mining assisted the Pennsylvania Department of Environmental Protection in developing a report entitled *Conventional Full Cost Bonding of Anthracite Mining Operations*. The Department of Environmental Protection received direct assistance in procuring aerial photography, Global Positioning System surveying, contour generation from the aerial photography, and earthVision modeling. The effort resulted in several revised bond amounts and a good methodology for use in other locations.

Use of high resolution digital aerial photography and satellite imagery are continuing to be used by state and Office of Surface Mining offices throughout the country. In 2003, the Office of Surface Mining provided imaging and mapping services on over 250,000 acres of permitted mining lands in seven states.

In June of 2003, a joint cooperative effort between Office of Surface Mining, Wyoming Land Quality Division, and Powder River Coal Company resulted in the initiation of a pilot project. Satellite imaging data was purchased and will be used for resolving bond release and reclamation issues. This effort may lead to new techniques in streamlining effective bond release techniques.

Mobile Computing

During 2003, software running on mobile computing devices for both reclamation and regulatory applications was successfully tested in the states of Missouri, Indiana, Oklahoma, and Illinois. Mobile computing is the next step beyond Global Positioning System data collection. It uses full function computing hardware to implement field solutions.

Wyoming state and Office of Surface Mining inspectors verify slope angle, topsoil depth, and placement of wildlife habitat features in the field through the use of company-supplied digital maps. This verification is now done without the previous delays involved in downloading data to desktop computers in the office.

State reclamation experts are using mobile Geographic Information System technology in Alaska and Ohio to map reclamation project features and prepare bid documents for reclamation project design. The ability to create quick-turnaround, accurate maps has replaced costly surveying or hand-sketched maps previously used to prepare these documents. The Office of Surface Mining will continue to support this technology and to move it into the day to day operations of regulatory and Abandoned Mine Land programs in 2004.

Acid Drainage Technology Initiative

The Acid Drainage Technology Initiative is a partnership, which the Office of Surface Mining has joined with the coal industry, states, academic, other governmental agencies, and groups to identify, evaluate, and develop "best science" based practices to prevent new acid mine drainage and eliminate existing sources.

The Coal Mining Sector of the Initiative directs and coordinates activities of Initiative partners. The

Interstate Mining Compact Commission, representing Eastern and Midwestern coal-producing states, and the National Mining Association, representing the U.S. coal industry, are also participants. The National Mine Land Reclamation Center at the West Virginia University serves as the central location for Acid Drainage Technology Initiative activities and related technology transfer. While the focus of the Initiative initially was on the coalfields of Appalachia, the scope was expanded when the Metal Mining Sector Work Group was formed in 1999 to include Western and other hard rock mining.

The Office of Surface Mining has been funding this initiative at approximately $200,000 per year. During 2003 this funding was used for field verification of acid mine drainage prediction; monitoring and follow up evaluation of acid mine drainage passive treatment systems; the printing of additional copies of the *Handbook of Technologies for Avoidance and Remediation of Acid Mine Drainage*; and continuation of work on standard Acid Drainage Technology Initiative kinetic testing protocols used in evaluating acid mine drainage potential, monitoring the performance of in-situ drainage treatment systems, evaluating methods of identifying selenium in geologic and overburden materials, and evaluating methods to remove selenium from drainage water.

Slurry Impoundments

Since 1996, there have been four breakthroughs from coal preparation plant slurry impoundments into underground mines. The National Research Council of the National Academies of Science conducted a study on preventing coal waste impoundment failures and breakthroughs and released a report on that study in October 2001. The report included several recommendations for joint work by the Office of Surface Mining and the Labor Department's Mine Safety and Health Administration to minimize the potential for future breakthroughs. The Office of Surface Mining and Mine Safety and Health Administration established a joint technical committee to facilitate ongoing coordination. In addition, several ad hoc technical working groups were developed to prepare responses to the specific recommendations contained in the National Research Council report. These groups, which also involved representatives from state regulatory authorities, prepared a report to Congress, which was released on August 15, 2003 (See www.osmre.gov/pdf/coalwastereport081503.pdf for a copy of the report). In addition during 2003, the Mine Safety and Health Administration hosted a one-day technical meeting on the use of geophysical methods for identifying underground mine voids and the Office of Surface Mining along with the Mine Safety and Health Administration hosted a three-day interactive forum on geophysical methods.

Revised Universal Soil Loss Equation

For the second consecutive year the Office of Surface Mining distributed, a CD-ROM package containing *Guidelines for the Use of the Revised Universal Soil Loss Equation (RUSLE) on Mined Lands, Construction Sites, and Reclaimed Lands,* for the public domain RUSLE Version 1.06, along with the software. The upgraded software now operates in WINDOWS 2000 and XP environments. The guidelines are providing information for maximizing the accuracy of soil-loss prediction estimates, recommending procedures ensuring soil-loss estimates calculations that are generally reproducible, and identifying critical areas for future research. In its outreach, the Office of Surface Mining is modifying the above RUSLE Guidelines to complement the new Department of Agriculture's RUSLE 1.06c software, and the Agriculture Department has incorporated the Office of Surface Mining Guidelines into their version of RUSLE 2.0 for agricultural purposes.

Coal Combustion By-Products

The Office of Surface Mining has continued to be involved in several Coal Combustion By-Product related activities, including technology transfer, rulemaking

efforts by the Environmental Protection Agency, and research efforts by the Energy Department's National Energy Technology Laboratory.

During 2003 the Office of Surface Mining also provided extensive technical and regulatory guidance on by-product placement at coal mining sites to the Interstate Mining Compact Commission for its State/Federal Initiative that is building a state consensus on Coal Combustion By-Products regulatory guidance. In support of by-product research activities, the Office of Surface Mining actively participates on the Energy Department's Combustion By-Products Recycling Consortium national steering committee that evaluates and makes recommendations for funding of Coal Combustion By-Products research. For additional information on by-product placement at mine sites see www.mcrcc.osmre.gov/ccb.

Bat Conservation and Mining

The Office of Surface Mining has worked to protect the populations and habitats of bats associated with mining since 1998 when a Memorandum of Understanding was signed with Bat Conservation International. During 2003, the Office of Surface Mining began planning for its third technical forum on bat conservation and mining. The subject of this forum is Protection of the Endangered Indiana Bat associated with Coal Mining. The Office of Surface Mining has also continued its efforts to produce a "state-of-the-art" manual on Bat Gate Design for distribution by Bat Conservation International and the U.S. Fish and Wildlife Service during 2004. The manual will include 41 presentations on why bats and their habitats need protection, how to plan for a mine or cave closure project, how to design specific bat friendly closures, how to manage the construction of a bat friendly closure, and how to maintain a closure structure and monitor the effects of that closure on bat populations. A Bat Conservation and Mining information is available at, www.mcrcc.osmre.gov/bats.

Reforestation

The Office of Surface Mining has sponsored outreach and technology transfer events and many technical and policy forums to promote a market-based approach to reclaiming mined lands and increasing carbon storage through reforestation. The environmental and economic benefits of this approach include higher quality reclamation, an increase in the number of sites reclaimed, economic opportunities including employment for local communities, aesthetic and recreational improvements, sale of forest products by landowners or lessee, and the opportunity for reporting carbon reductions though sequestration in forests. This activity is of interest to mining companies, electric utilities, land management companies, environmental organizations, and provides the opportunity to promote ecologically diverse balanced forest ecosystems.

The Office of Surface Mining's Reforestation effort embraces all the aspects of Secretary Norton's philosophy of partnering by working with state agencies, coal and electric utility companies, schools and universities, local communicates, conservation groups, and other federal agencies to achieve her 4Cs goal. The market-based approach to our reforestation initiative maximizes opportunities and incentives for partnering among various groups such as companies who have a special interest in planting and monitoring trees to measure carbon sequestration, water quality enhancement, and the use of coal by-products as plant growth stimulants. Reforestation also fosters environmental stewardship. In one instance, the Office of Surface Mining partnered with a coal company and a high school environmental science class. Students learned the basics of forestry, tree identification, and surveying and then assisted with statistical sampling and data collection to document survival and growth rates. This sampling will continue on an annual basis for the next ten years. In some states, the Office of Surface Mining is working with the coal industry to encourage reforestation in a manner that is in

Located in the heart of the Powder River Basin, this mine operates on a 12,150 acre permit and has removed more than 345 million tons of coal since in began in 1978. Reclamation includes reestablishing the gently rolling prairie landscape and vegetation that existed before mining began. In addition, wetlands that were disturbed during mining have been replaced. In this dry climate the water habitat provides protection for waterfowl and is an outstanding habitat for wetland plants and animals. The quality of this reclamation reflects the intent of the Surface Mining Law to minimize the adverse impacts of coal mining on fish and wildlife habitats and to enhance those environmental values where possible.

line with that state's established guidelines. The goals of other reforestation projects involving states and universities include demonstrating the technical and economic feasibility of reclaiming mined land to forest, and research on environmental practices concerning innovative reforestation techniques.

An Outreach Packet outlining the benefits of reforestation and designed to attract the attention of these potentially interested parties has been published and is available for downloading at www.osmre.gov/market-basedindex.htm. A more technical manual is being developed and will become available in 2004. A ten minute video, *Reforestation: Build a Forest for the Future,* is also available. This video explains the forestry reclamation approach technology useful to creating successful and productive forest land on reclaimed mine sites.

For additional information on the Office of Surface Mining's Reforestation Initiatives, see www.mcrcc.osmre.gov/tree.

International Activities

During 2003, the Office of Surface Mining and its state partners continued to work with the Indonesian Ministry of Energy and Mineral Resources to provide assistance in the reform of mining policy and the improvement of mine environmental management in Indonesia. The Ministry is continuing to decentralize many of its operations and responsibilities to lower levels of government, and the Office of Surface Mining is providing training to promote the implementation of decentralization activities.

As in previous years, the United States Agency for International Development provided the Office of Surface Mining with one hundred percent funding for its activities in support of technical assistance to the Ministry.

The model of Cooperative Federalism found in the Surface Mining Law is being used as a point of departure for helping the Ministry train local government officials in the many functions that make an effective mine regulatory program. As in previous years, the Office of Surface Mining has continued to rely upon personnel from state regulatory authorities to provide the expertise and technical capacity to train and otherwise assist Ministry and local government officials in their new tasks. The highly visible role of the state regulatory authorities in the project has been important in demonstrating to Ministry officials how national and regional government personnel can work together to produce positive results. Joint teams of federal and state experts have carried out most of the project's activities.

In October, a team of federal and state personnel from the regulatory authorities of Kentucky and Pennsylvania presented a course on principles of mine inspections to trainees from local and provincial governments in Kalimantan, Indonesia. Students from several provinces and local governments throughout the Indonesian archipelago attended the course, which included extensive fieldwork at mine sites in East Kalimantan.

Because of the uncertain situation in Indonesia following the violence in Bali, Office of Surface Mining international activities in Indonesia were suspended until May 2003. The activities resumed with the visit of a seven Indonesians to the United States for the purpose of learning how the federal and state regulatory programs work together to improve mining operations and protect the environment. With the assistance of personnel from the Maryland, Pennsylvania, and Colorado Regulatory Authorities, the visitors were provided with an extensive background in the key elements that contribute to a successful regulatory program. The delegation met with state regulatory program officials, visited a number of active mine sites, and were briefed by officials from other federal agencies which worked with the Office of Surface Mining and state regulatory authorities.

The Office of Surface Mining's and the states' successful program of training Ministry and local agency officials in the suppression of coal seam fires led to international media attention for the efforts of the project to eliminate hazardous fires and protect the habitat of threatened species such as the orangutan. The Project Director and other officials involved in the project presented a paper on the program's accomplishments at the February 2003 annual meeting of the American Association for the Advancement of Science.

Systems and Databases

Applicant/Violator System

One of the underlying principles in the Surface Mining Law is that those who conduct mining are responsible for returning the land and water to productive use. Section 510(c) of the Law prohibits the issuance of new permits to applicants who own or control operations with unabated or uncorrected violations.

The primary purpose of the Applicant/Violator System is to provide state regulatory authorities with a central database of application, permit, ownership and control, and violation information. Federal and state officials review Applicant/Violator System data when evaluating the applicant's eligibility for new permits. The system is also used to determine the eligibility of potential recipients of Abandoned Mined Land reclamation contracts and for inspection and oversight purposes.

Access to the system is available to the public, coalfield citizens, coal companies, and industry representatives through the use of communications software distributed (free of charge) by the Applicant/Violator System Office in Lexington, Kentucky. Upon request, this office provides system users with demonstrations and training, often tailored to meet the specific needs of the target audience, on how to access and interpret system information.

During the first three quarters of this reporting year, the Office Surface Mining responded with quality reviews for 3,055 requests for Applicant/Violator System data evaluations from state and federal regulatory authorities and state abandoned mined Land Program officials. The Office Surface Mining collected and/or settled payments of civil penalties and reclamation fees in the amount of $1,467,297 due, in part, to violation information in the system. For this same period, customer satisfaction ratings averaged 98 percent, making this the fifth consecutive year that the Lexington office has received extremely high customer satisfaction ratings.

Over the next two years, the Office of Surface Mining will be expanding and improving the Applicant/Violator System. In order to bring the now nine-year-old system into the modern "E-gov" generation, the system is being rewritten/redesigned and changed from a software dependent system to an enhanced web-based service.

General information about the system, including access and user information, instructions for obtaining access software, and how to obtain customer assistance, can be found at www.avs.osmre.gov.

Geographic Information System Databases

Development of Geographic Information System databases continues to be a priority in the Western Region. Personnel are taking both map and tabular data from mining operations and placing it into databases. This enables reviewers to bring up any of the permit application data on the computer screen for quick reference and analysis. It also allows reviewers to combine data for detailed analyses.

In 2003, the Knoxville Field Office continued development of its Geographic Information System. Coal mining permit boundaries and geologic and hydrologic resources in Tennessee were added to the system. This information was used to conduct reviews of permit applications, conduct field inspections of coal

mining operations, support water quality inspections, and supply information used in the Mountain Top Mining and Valley Fill Draft Environmental Impact Statement.

Technical Library Resource Center

In 2003 the Office of Surface Mining Technical Library continued to actively publicize the URL www.wrcc.osmre.gov/glas for access to the on-line catalogue by making it available through the Colorado Virtual Library (www.aclin.org/). This was done to make it more widely known as a resource for information related to surface mining, reclamation, and other technical subjects in the mining and environmental protection field. The bibliographic records for the books and reports, along with a growing electronic media library, on-line searches, research services, and interlibrary loans enabled the librarian to respond to more than 335 requests from state regulatory agency staff, other federal agency staff, citizens, coal industry, consultants, and academics, in addition to fulfilling more than 240 Office of Surface Mining requests for information. An "Ask A Librarian" link for individuals to contact the Librarian directly, was a new feature initiated during 2003. The technical library plays a significant role in technology transfer in assisting with the dissemination of electronic information and publications to the Office of Surface Mining's constituents.

Training, Consultations, Forums, and Conferences

National Technical Training Program

The Office of Surface Mining continued its emphasis on providing technical assistance to the states and tribes by enhancing the technical skills of regulatory and reclamation staff. During 2003, 52 sessions of 33 different courses were offered (see Figure 5). In addition to regularly scheduled courses, in response to specific requests, special sessions of the Subsidence, Blasting and Inspection, and the Excess Spoil Handling and Disposal courses were held for West Virginia students.

Figure 5

Course Name	Sessions	Students
Acid-forming Materials: Fundamentals & Applications	1	22
Acid-forming Materials: Planning & Prevention	1	16
Acid Passive Treatment	1	15
Advanced Blasting: Investigations & Analysis	4	67
AML Design Workshop: Dangerous Openings	1	12
AML Design Workshop: Dangerous Highwalls	1	12
AML Design Workshop: Fires	1	13
AML Workshop: Subsidence	1	8
AML Realty	1	17
AML Reclamation Projects	1	24
Applied Engineering Principles	2	34
Basic Inspection Workbook	0	38[1]
Blasting and Inspection	2	30
Bonding Workshop: Administrative & Legal Aspects	1	12
Bonding Workshop: Cost Estimation	1	19
Effective Writing	2	48
Enforcement Procedures	1	21
Erosion and Sediment Control	2	33
Evidence Preparation and Testimony	1	18
Excess Spoil Handling	2	46
Expert Witness	1	11
Historic and Archeological Resources	3	66
Historic and Archeological Resources: Refresher	1	16
Instructor Training Course	1	16
NEPA Procedures	2	48
Permit Findings Workshop	1	22
Permitting Hydrology	1	16
Principles of Inspection	2	35
Soils and Revegetation	2	39
SMCRA and the ESA: Implementation of the 1996 Biological...	2	56
Subsidence	3	72
Surface and Groundwater Hydrology	2	30
Underground Mining Technology	2	38
Wetlands Awareness	2	42
Total	**52**	**974**

1. Workbooks distributed

Approximately 50 percent of the U.S. surface coal mining production came from the Powder River Basin in Wyoming during 2003. In this region where the land is flat to moderately rolling and the mine sites are large, the overburden is excavated down to the coal seam using large equipment. Because very thick coal seams are mined, these operations disturb only a small amount of acreage per ton of coal mined. However, under the Surface Mining Law, they must reclaim the land and meet the same standards that all U.S. coal mines follow.

Additionally, a special session of the Principles of Inspection course was held for Alaska, and a special session of the Advanced Blasting course held for Kentucky. A new course, SMCRA and the Endangered Species Act, was offered for the first time to facilitate implementation of the 1996 Biological Opinion issued to the Office of Surface Mining by the U.S. Fish and Wildlife Service. This course, which was developed in conjunction with Fish and Wildlife Service and personnel representing the State Regulatory Authorities, provides information on how requirements of the Endangered Species Act are integrated into the Surface Mining Law permitting process. Another new course offering was Advanced Blasting: Investigation and Analysis of Blasting Effects. This course enhances student skills in gathering and analyzing blast-related information and will assist in resolving citizen complaints concerning ground vibrations, air blasts, fumes, and flyrock. Another recently developed course, Acid-Forming Materials AML Workshop, was designed to assist abandoned mine land students in the Midwest in reclaiming problematic areas. This course is currently being adapted for use by Eastern abandoned mine land experts. Modeling on the accomplishments of the highly successful state and tribal 2002 PHC/CHIA benchmarking session, the training program worked with the Interstate Mining Compact Commission to determine appropriate topics for future workshops. The initial workshop shared information about model State programs with the goal of adopting or adapting processes to more effectively delivering products and services (e.g., permitting) to customers. The Office of Surface Mining anticipates that additional workshops will be held in the near future with one on mine mapping planned for early 2004 and a second to be held later in 2004 on drilling and grouting on abandoned mine land sites or other reclamation technologies.

In line with the President's e-government initiative and in conjunction with the states, the Office of Surface Mining initiated development of a new on-line training course to provide students with basic information on acid-forming materials prior to attending advanced acid-materials classes. This will result in better prepared students and more in-class time to address applications and advanced concepts. Some cost savings from reduced travel are anticipated as well. A new course, Passive Treatment Systems for Acid-Mine Drainage, was piloted in Summer 2003. The purpose of the course is to provide students with highly interactive information and exercises that 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 passive treatment projects. The audience for this course is permitting specialists, inspectors, and abandoned mine land specialists.

All aspects of the National Technical Training Program - from identification of training needs through course development and presentation - are cooperative efforts of state, tribal and Office of Surface Mining offices. This joint effort exemplifies Secretary Norton's 4Cs of cooperating, communicating, consulting with local agencies, all for the purpose of fostering good conservation practices. During 2003, there were 171 instructors - 50 percent from 15 Office of Surface Mining offices, 40 percent from 13 States, five percent from the Interior Department's Solicitor's Office, and five percent from other sources. The 52 class sessions, which reached 974 students, were presented in 29 locations in 15 states. State students accounted for 81 percent of students; tribal students for four percent; Office of Surface Mining students for 13 percent; and remaining two percent for other participants. The program's Government Performance and Results Act attendance goal of 900 students was exceeded by 74 students and the customer satisfaction rating of 96 percent exceeded the goal of 90 percent by 6 percent.

Scientific and Engineering Software Applications Training

Training of state, tribal, and Office of Surface Mining personnel in the practical application of analytical software is an integral part of the technical assistance. Instructor-led courses incorporate the reclamation experience of its instructors and students to provide a unique training experience. Training during 2003 totaled 415 students in 88 classes, compared to 2002 levels of 500 students in 59 classes. Eight instructor-led courses were held at customer sites with critical training needs for software use. The training program employed 43 different instructors in 2003; 20 of these were state program experts. The Government Performance and Results Act rating for this training satisfaction for 2003 was 91 percent. The four categories making up this score breakdown as follows: class satisfaction 88 percent, facility 89 percent, lead instructor 94 percent, and co-instructor 91 percent. New courses offered in 2003 included Global Positioning System hardware and software use in Abandoned Mine Lands, and courses in Geographic Information Systems spatial analysis, and remote sensing.

Additional E-training courses were offered to students in 2003. Thirteen on-line Geographic Information System courses were offered in multiple sessions through a contract with the Environmental Systems Research Institute Virtual Campus for basic geographic information system training. During the year 175 students participated in the Institute classes. By the end of 2003, 89 students had completed their courses, a completion rate of over 50 percent, well above industry e-learning training completion averages.

Technical Workshops

As a part of Billings Land Reclamation Symposium's joint meeting with American Society of Mining and Reclamation, the Office of Surface Mining sponsored and video-recorded the one-day Stream Channel Design Reclamation Workshop – using the Fluvial Geomorphic Approach to Mined Land Reclamation.

In addition, the Office of Surface Mining and the Environmental Protection Agency cosponsored three joint implementation coordination workshops related to the newly promulgated Environmental Protection Agency 40 CFR Part 434 subcategory of Western Alkaline Coal Mine Drainage and four related to the 40 CFR Part 434 Remining Operations subcategory.

Bonding Assistance

During 2003 the Office of Surface Mining contracted for on-site administrative bonding technical assistance by a Bonding Specialist who provided topic specific training to the states of Alaska, Colorado, Montana, New Mexico, Utah and Wyoming. In addition, all Western state bonding staff were notified about fraudulent bonds being issued by an illegal Florida agent, in addition to providing updates and advice on the U.S. Treasury Department's Circular 570 that identifies qualified surety companies.