

TECHNOLOGY DEVELOPMENT AND TRANSFER

		2002 Actual	2003 Estimate	Uncontroll. & Related Changes (+/-)	Program Changes (+/-)	2004 Budget Request	Change from 2003 (+/-)
Regulation & Technology	\$\$\$	12,151	12,593	232	-76	12,749	156
	FTE	117	116	0	0	0	0
Abandoned Mine Land	\$\$\$	4,118	4,164	31	-11	4,184	20
	FTE	16	16	0	0	0	0
TOTAL	\$\$\$	16,269	16,757	263	-87	16,933	176
	FTE	133	132	0	0	132	0

The Technology Development and Transfer business line (program activity) provides resources for technical assistance, training, technology development and technology transfer program sub-activities. This program activity supports and enhances the technical skills that States and Tribes need to operate their regulatory and reclamation programs in order to effectively implement SMCRA. Thus, this program activity is an integral component and supports accomplishment of OSM's Environmental Restoration and Environmental Protection business lines goals.

Through support of OSM's restoration and protection goals TDT funds support two of the Departmental new Strategic plan mission quadrants and implements the Secretary's 4C's - Communication, Consultation, and Cooperation, all in the service of Conservation. TDT is a nation-wide program that provides resources to States and Tribes that meet their specific technical and training needs in carrying out the requirements of the SMCRA. Through accomplishment of program activities land and water degraded by past mining is improved supporting the Department's Resource Protection mission goal and use of responsible mineral extraction technologies under the Resource Use mission goal.

In 2004, OSM will continue to expand the use of Technical Innovation and Professional Services (TIPS) in technical decision-making processes related to SMCRA; address the remediation of acid mine drainage through participation in the Acid Drainage Technology Initiative; finalize changes and focus on implementation of the final "Ownership and Control" rule; and provide training and technical assistance to meet identified needs of States and Tribes. Also, OSM's technology transfer program will continue its support for electronic permitting and mobile computing efforts, by sponsoring interactive technical forums and workshops. In addition, OSM will continue to provide regional technical service, libraries, and more efficient access to COALEX (a computer-assisted library search service).

Operational Process (Program Activities): The Technology Development and Transfer program activities enhance the technical skills that States and Tribes need to operate their regulatory and reclamation programs in order to more effectively implement SMCRA. These program activities are an integral part of accomplishing Environmental Restoration and Environmental Protection to achieve OSM's goals and outcomes.

OSM provides technical training to OSM staff, and States and Tribes on a variety of topics. New technologies, changes in regulations, and staff turnover necessitate the need for continued technical training. To solve problems related to the environmental effects of coal mining, OSM provides multi-disciplinary technical assistance and works with industry, States, Tribes and the public on technical issues arising from new regulations. Other technical assistance efforts include the Technical Innovation and Professional Services (TIPS – Note that this is a name change that occurred in 2002. Formerly the Technical Information Processing System, the acronym remains the same), the Applicant Violator System (AVS), Electronic Permitting (EP), and the Small Operator Assistance Program (SOAP). Technology transfer is a major part of OSM's cooperative effort with States and Tribes.

<p style="text-align: center;"><i>TECHNOLOGY DEVELOPMENT & TRANSFER</i></p> <p style="text-align: center;"><i>ENCOMPASSES:</i></p> <p style="text-align: center;"><i>Technology Development</i></p> <p style="text-align: center;"><i>Technology Transfer</i></p> <p style="text-align: center;"><i>Technical Training</i></p> <p style="text-align: center;"><i>Electronic Permitting (EP)</i></p> <p style="text-align: center;"><i>Technical Innovation and Professional Services</i></p> <p style="text-align: center;"><i>(TIPS)</i></p> <p style="text-align: center;"><i>Applicant Violator System (AVS)</i></p> <p style="text-align: center;"><i>Small Operator Assistance Program Grants (SOAP)</i></p>

FY 2004 PERFORMANCE GOALS AND MEASURES

The Technology Development and Transfer (TDT) business line supports accomplishment of OSM's Environmental Restoration and Protection mission goals. TDT program activities ensure that there will be knowledgeable Federal, State, and Tribal regulatory and reclamation staff to effectively implement SMCRA, supported by the technical training and assistance provided by OSM specialists. Through accomplishment of OSM's two mission goals the business line supports the Department's Resource Protection and Use goals.

The outcome of TDT program performance is ultimately measured by the success of the Surface Mining program in carrying out the environmental restoration and protection missions. In addition, performance for the business line is measured through the number of staff technically trained (including knowledge and skills taught and applied), the utilization of automated technologies (such as TIPS), and the quality and timeliness of technical assistance provided by OSM, determined via evaluations and customer service surveys.

Table 1 - Strategic Goals and Measures

OSM Goal Areas:			
Environmental Restoration			
To provide a clean and safe environment by reclaiming and restoring land and water degraded by past mining			
Environmental Protection			
To protect people and the environment to ensure that the land is suitable for official use after mining has ceased.			
DOI Goal	DOI Outcome	OSM Goal	OSM Measures
Resource Protection — Improve Health of Watersheds, Landscapes and Marine Resources that are DOI Managed or Influenced in a Manner Consistent with Obligations Regarding the Allocation and Use of Water.	1. Number of equivalent land acres for which degradation from past mining has been reclaimed 2. Number of stream miles/ acres for which degradation from past surface coal mining has been reclaimed	Maintain a high customer satisfaction rate for scientific and technical products and assistance	Percent satisfaction with scientific and technical products and assistance.
Resource Use – Manage or Influence Resource Use to Enhance Public Benefit, Promote Responsible Use, and Ensure Optimal Value – Energy	1. Ensure X% of active sites are free of off-site impacts. 2. Number of acres where reclamation goals are achieved as evidenced by release from phase III performance bonds.	Maintain a high customer satisfaction rate for technology development and transfer, technical assistance and training program	Percent satisfaction with technical assistance and training program.

Data Verification and Validation for Measures: Technical training measures are based on customer surveys already in place and readily available course attendance records. Measures of general technical assistance, technology transfer, and AVS success will be based on customer surveys approved by OMB.

The measures of this business line are varied, based on the diversity of activities involved in achieving this goal. The satisfaction of those customers with the quality and relevance of the technical assistance provided will be indicated by customer surveys and questionnaires. Other measures will include the number of times TIPS is used and number of students trained.

Actions Required to Achieve Annual Goals: In FY 2004, OSM plans to continue its efforts in this business line. For example, as responses are received from the customer surveys, the activities within the business lines will be evaluated to identify any needed improvements or changes. Also, TIPS, NTTP, the Mine Map Repository, and AVS will increase access to users

by continuing to provide material on the Internet and supporting the administration's e-government initiative.

Resources, Skills, and Technology Needed: A goal for FY 2004 is to continue ensuring that States, Tribes, and OSM have the best available technical data and information needed to make good science-based decisions regarding mining plans, reclamation project design, permit reviews, and acid mine drainage remediation and prevention. To successfully implement the surface mining regulatory and reclamation programs, OSM, as well as the States and Tribes, must maintain multi-disciplinary staffs that are fully competent in addressing a wide variety of technical issues that impact these programs.

The total request for this business line is \$16.9 million. The FY 2004 President's Budget requests \$11.4 million for Technical Assistance (including the Applicant Violator System), of which \$1.5 million for the Small Operators Assistance Program; \$2.3 million for Technical Training; and \$3.2 million for Technology Transfer efforts are allocated to meet the annual goals set forth above.

Included in the FY 2004 President's budget request for Technology Transfer program activity is \$200,000 for the Acid Drainage Technology Initiative (ADTI), an ongoing effort of OSM, State and other Federal agencies, academic, and industry as part of the Clean Streams Program. The objectives of the ADTI are to compile, assess, and documents the "best-science" technology solutions to acid mine drainage (AMD) reclamation problems as well as to refine the most effective methods for accurate AMD prediction.

The following section details, by program activity, the funding and FTE resources required to meet our customer satisfaction performance measures. It also includes examples of the types of technical training, assistance efforts, and transfer provided by this business line.

**Table 2 – Justification of Program and Performance
Technology Development and Transfer
Summary Increases/Decreases for FY 2004
(Dollars in Thousands)**

Program Activity		Regulation & Technology			Abandoned Mine Lands			Total			Inc/Dec
		2002 Act.	2003 Est.	2004 Req.	2002 Act.	2003 Est.	2004 Req.	2002 Act.	2003 Est.	2004 Req.	
Technical Assistance	\$\$\$	8,611	8,983	9,090	2,335	2,352	2,357	10,946	11,335	11,447	112
	FTE	80	79	79	4	4	4	84	83	83	0
Training	\$\$\$	1,951	1,985	2,008	233	241	246	2,184	2,226	2,254	28
	FTE	18	18	18	4	4	4	22	22	22	0
Technology Transfer	\$\$\$	1,589	1,625	1,651	1,550	1,571	1,581	3,139	3,196	3,232	36
	FTE	19	19	19	8	8	8	27	27	27	0
TOTAL	\$\$\$	12,151	12,593	12,749	4,118	4,164	4,184	16,269	16,757	16,933	176
	FTE	117	116	116	16	16	16	133	132	132	0

ONGOING PROGRAM

The following program activities support OSM's goal to strengthen the capabilities of the States, Tribes, and OSM staff to implement SMCRA effectively through quality technical and scientific information, expertise, and training. Skill and knowledge enhancement is critical to the continued success of the Surface Mining program and accomplishment of the Department's Resource Protection and Use mission goals.

OSM's stakeholders (States, Tribes, and industry) continue to express support for Technology Development and Transfer (TDT) efforts and encourage OSM to provide the types of technical support needed to effectively and efficiently meet SMCRA, the National Environmental Policy Act, and other environmental and safety laws. Cost-effective compliance will help industry remain competitive with other energy sources. Helping industry achieve up-front compliance will reduce the need for additional regulatory resources. The TDT program area described in the following pages represents those activities where OSM staff provides direct technical support and ongoing efforts in other business lines.

1. Technical Assistance

This program activity provides assistance to State regulatory and reclamation staff, and to the OSM staff that review and monitor State programs, develop rules or policy, litigate SMCRA challenges or enforcement actions, or maintain other technical support infrastructure like TIPS, AVS, and technical training programs. Technical activities such as permit review, citizen complaint evaluation, and cumulative hydrologic impact assessment take place where OSM is the regulatory authority. Of the \$11.4 million requested, \$0.7 million support OSM's Environmental Restoration and \$10.7 million supports OSM's Environmental Protection mission goals.

Technical assistance also is provided for AML project design and monitoring where OSM is responsible for AML emergency and priority projects. However, these types of endeavors are integral parts of the Environmental Protection and Restoration business lines. They are not included in the TDT program activity.

OSM intends to attain a 92 percent customer service rate for its technical assistance efforts in FY 2004. Customer surveys are used to document the responsiveness of OSM's technical assistance to its customers in a timely and professional manner. By meeting the technical assistance needs, OSM can help effectively achieve OSM's Environmental Restoration and Environmental Protection mission goals.

a. Technical Policy Assistance

OSM specialists provide technical assistance to State and OSM regulatory and reclamation policy staff. The areas of assistance include rulemaking; citizen complaint investigations regarding the mining-relatedness of offsite impacts; guideline development; State program amendments; State mining permit evaluation; AML problem

evaluation; blasting policy; prime farmland reclamation standards; coal combustion by-product placement; reclamation bonding; threatened and endangered species; land unsuitability determinations; participation as technical experts on interagency committees; acid mine drainage (AMD) prevention and remediation; stream and underground mine flooding; bond release and sufficiency; mountaintop mining and valley fills; permit findings; remining; impoundment stability; subsidence caused by underground mining; and assistance in fostering tribal primacy by helping tribes develop technical capabilities.

Projected activities for FY 2004 include:

- Mountaintop mining and valley fills: (MTM/VF) In late 1998, settlement of the Clean Water Act (CWA) litigation counts (the *Bragg v. Robertson* case in federal district court in southern West Virginia) obligated OSM, the Fish and Wildlife Service (FWS), Environmental Protection Agency (EPA), Corps of Engineers (COE), and West Virginia Department of Environmental Protection (WVDEP) to prepare an EIS by the end of 2000. The lack of comprehensive data on the impacts of MTM/VF warranted undertaking studies spanning several years, delaying completion. The Bragg settlement agreement also established a coordinated process for obtaining authorization for surface coal mining operations placing fill in waters of the United States, under section 404 of the (CWA).

OSM has committed 52 person years to both the EIS and the authorization process, including technical studies assessing future mining potential; evaluating the impact of mining restrictions on coal recoverability, economics, and environmental impacts; analyzing offsite impacts of mine dust and blasting fumes; blasting citizen complaints; valley fill hydrology and stability; cumulative stream and deforestation impacts; and documenting stream conditions downstream from mountaintop mining. In the Spring of 2003, the draft EIS will be released for public comment. We anticipate the EIS will be finalized in FY 2004.

- Impoundment Leaks into Underground Mine Workings: During the coal preparation process waste rock is separated from the coal. The larger, coarse fragments of coal waste (typically shale) are used to construct an embankment or dam, which impounds the fine coal waste fraction in slurry (i.e., mixed with water). In heavily mined areas, many of these impoundments must be constructed over active or abandoned underground coal mine workings.

Since 1994, there have been six reported unplanned discharges into underground mine workings from overlying impoundments. Four of these breakthroughs had discharges to the surface. The latest breakthrough occurred in early FY 2001 (October 2000), in Martin County, Kentucky when more than 250 million gallons of coal waste slurry and black water entered underground mines through subsidence cracks, exiting two mine portals in two different watersheds. The slurry moved downstream until the tributaries joined, entering the Tug Fork

River, and continued flowing through the Big Sandy River until assimilated by the Ohio River. Water users all along the path of the slurry were forced into alternative sources. A monumental environmental cleanup effort was required.

During FY 2002, OSM, Appalachian States, and MSHA completed their investigation of the impoundment leak into the underground mine. The National Academy of Sciences (NAS) also completed its study addressing technical issues related to impoundments above underground mines. In addition, OSM, in coordination with Appalachian States initiated evaluation of other high-risk mining-related impoundments over underground mines to ensure against future incidences. OSM also evaluated and began implementation of appropriate recommendations from the study conducted by NAS.

In FY 2003, OSM, in coordination with the States and MSHA, will determine whether revision to the existing regulations and engineering practices are necessary as a result of investigations and NAS study. OSM and MSHA have formed a joint technical committee and several ad hoc work groups to review technical issues related to underground mining and surface facilities. This study will continue into 2004. OSM will sponsor an interactive forum on the use of geophysical methods for locating underground mine workings, which will be held in Lexington, Kentucky in July of 2003.

- Blasting: The use of explosives is an integral part of most surface coal mining. Overburden must be broken, often through the use of explosives, before it can be removed to expose the coal for mining. Citizens living near a mine sometimes-express concern about the vibrations, noise, and flyrock resulting from blasting. SMCRA and OSM's regulations contain requirements limiting the energy of blasts to protect the public and property from damage caused by blasting.

Many States, including Pennsylvania, Ohio, Alabama, Missouri, Oklahoma, and Kentucky frequently ask for OSM help in evaluating damage complaints, reviewing blasting plans, or setting vibration limits to ensure the prevention of damage to property. OSM helps the States measure damage potential through field's studies and set protective limits on unique structures such as historic buildings, mobile homes, hospitals, water towers, and log homes. OSM is also providing specialized training for West Virginia in the use of a computerized blasting evaluation program developed by OSM staff. The program is called the "Blast Log Evaluation Program". This program has been made available for free download from the TIPS website.

During 2003 and 2004, OSM will continue to evaluate data specific to unique structures (e.g. Navajo hogans) to determine amplification factors and damage potential from ground vibration and air blast. This information also will generate data that will be used to evaluate the effect of ground vibrations from large cast blasting operations on water wells less than 100 feet deep.

Beginning in FY 2003, OSM will be assisting five to six Eastern states in the development of a consistent training and examination program for blasting personnel to facilitate a reciprocity agreement between these states. The project will extend into 2004. The function of OSM will be to advise the states on program requirements and technical issues.

- Designating Areas Unsuitable for Surface Coal Mining: Section 522 of SMCRA (Designating Areas Unsuitable for Surface Coal Mining) establishes a process by which the public may petition the regulatory authority to limit or prohibit all or certain types of surface coal mining operations on non-Federal lands to protect certain features or environmental values. OSM receives and processes these petitions for all lands for which it is the regulatory authority. The decision-making process includes preparation of an environmental impact statement and a takings implication assessment.

OSM also is responsible for making valid existing rights determinations under section 522 (e) for all Federal lands and all lands for which OSM is the regulatory authority. Section 522 (e) prohibits or limits surface coal mining operating within certain areas, subject to valid existing rights.

Both unsuitability determinations and valid existing rights determinations require substantial technical and programmatic resources. They also involve litigation support if a takings claim is subsequently filed against the Federal Government.

- EPA Rulemaking on Coal Combustion By-Products (CCBs): OSM continues to work with EPA on reviewing and analyzing information related to EPA's intended drafting of a proposed rule in FY 2003 concerning the placement of CCBs at mine sites. This work will continue into 2004. During FY 2001 and 2002, EPA and OSM visited sites in several states to evaluate current practices and regulatory programs. OSM continued to assist EPA in its data collection, review, and analysis through its participation in meetings, monitoring implementation of EPA's risk analysis model, participation in site visits, and review of future proposed rules. OSM and the states provided EPA with significant information on how the existing SMCRA and solid waste regulatory programs operated by the states achieve adequate protection for the environment and the public at sites involving placement of CCBs at mine sites.
- Acid Mine Drainage (AMD): Surface and underground coal mining activities expose iron sulfide minerals in rock to weathering. The interaction of these rocks/minerals with air and water can result in acid mine drainage, which is the number one water quality problem in Appalachia and to a lesser, but still serious, extent in other coal and hard rock mining regions. OSM technical staff resources are focused on advancing and applying the best science to remediate AMD from abandoned pre-SMCRA mines and to prevent active mines from contributing additional new sources of AMD.

During FY 2003 and 2004, OSM will continue to participate in the Acid Drainage Technology Initiative (ADTI). ADTI is a collaborative effort among federal agencies, industry, the states, academia, and the National Mine Land Reclamation Center (NMLRC) to promote communication and technology enhancement in the field of acid mine drainage. The main goals of ADTI are to identify, evaluate and develop “best science” practices to prevent acid mine drainage and to describe, for existing sources of acid mine drainage, the best technology for avoidance/remediation practices.

OSM staff contributed significantly to an ADTI publication addressing avoidance/remediation of existing sources of acid mine drainage for Eastern coal mining and a comprehensive manual on acid mine drainage prediction focusing on Eastern coal mining. Both volumes were very positively received by the mining community. Ongoing projects that OSM is sponsoring in FY 2003 include:

- Field verification of the widely-used Acid Base Accounting method for predicting acid mine drainage production by comparing the quality of water at mines terminated from SMCRA jurisdiction;
- Continued development of two standardized kinetic test procedures for evaluating coal-mine related acid mine drainage potential by more realistically simulating the chemical conditions under which acid mine drainage forms; and

During FY 2003, OSM will work with other ADTI partners in its plans to develop a five-year roadmap for future activities, with actions to implement and refine these activities ongoing during FY 2004.

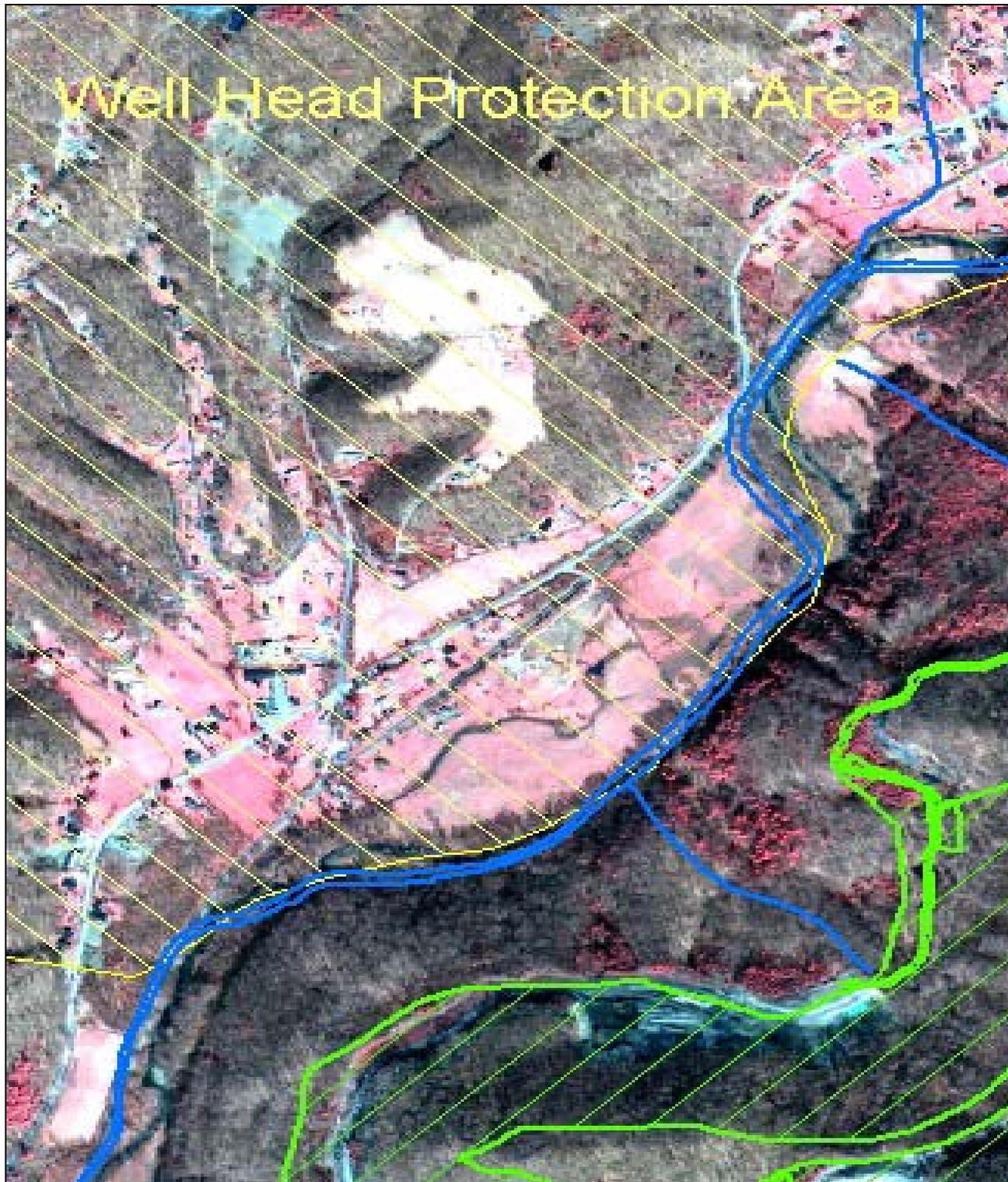
- Invasive Species: Executive Order 13112 of February 3, 1999, Invasive Species, directs Federal agencies whose actions may affect the status of invasive species to identify those actions and to the extent practicable and permitted by law, take actions to address the problem (consistent with their authorities and budgetary resources); and not authorize, fund or carry out actions that the agency believes are likely to cause or promote the introduction or spread of invasive species.

Educational materials have been placed on OSM’s Internet home page, and information on invasive species issues is under development for inclusion in the *Soils and Revegetation* training course which is taught as part of OSM’s Technical Training Program. States were surveyed to determine their efforts to address the threats from noxious weeds and invasive species, and programs were found to vary widely. OSM will assess and develop any Federal guidance necessary in this area into FY 2004.

b. Site-Specific Technical Assistance

OSM specialists assist in the technical aspects of compliance monitoring (including inspection and enforcement assistance), experimental practice reviews, reclamation cost estimate calculation, bond release application reviews, bond approval reviews, bond forfeiture reclamation designs, land unsuitability determinations, surveying, revegetation, geologic sampling, AML designs, subsidence and AMD abatement, and any technical assistance on citizen complaints and ten-day notices. Site-specific technical assistance varies from year to year and we cannot predict what specific types of assistance will be needed in FY 2004. Below are examples of the types of assistance provided to States and Tribes.

- Claiborne County, Tennessee: Having begun in 2003 and continuing into 2004, Knoxville Field Office personnel is supporting the analysis of extensive plans for surface coal mining operations in Claiborne County, Tennessee by technical reviewers using remote sensing technology and GIS. Satellite imagery of the mining area has been acquired under the TIPS Remote Sensing Initiative and is being analyzed. This imagery will be used to determine land use classification, build highly accurate elevation models to conduct flooding analysis, and investigate potential hydrologic impacts. Current mining operations exist within 1,000 feet of the wellhead protection area for a local community water supply system.



- Current and proposed surface mining in relation to municipal water supply in Claiborne County, Tennessee on March 5, 2002.

Proposed mining operations, which are projected to continue for the next 20 years, are located less than 500 feet upstream of the wellhead protection area as

shown above. This municipal water supply system was developed in the early 1980's through a multi-agency cooperative effort costing millions of dollars. An earlier study concluded that the receiving stream could not be restored to its original hydrologic condition because of the impacts of previous coal mining operations. OSM contributed approximately \$670,000 through the Abandoned Mine Land program to the effort as a Priority 1 project.

- Aerial Photography: At the request of the Pennsylvania Department of Environmental Protection, 100,000 acres of the southern Anthracite field was mapped using color aerial photography in support of the full-cost bonding program. One-foot pixel orthoimagery and 5-foot contours were delivered to the Pottsville office of the PA-DEP to support this work, along with TIPS hardware and software to support the volumetric analysis. Several bond amounts were changed as a result of the work. This project demonstrated that the technology works and other OSM customers will demand access to the method. Therefore, similar projects are expected through 2004. Aerial photography can be very costly, but the savings realized in setting correct bond amounts outweighs the cost.
- Hydrologic Balance Issues from Underground Mining: Over a century of extensive underground coal mining in Pennsylvania and West Virginia have left miles of interconnected, flooded working called mine pools. The water level in these mine pools may rise and overflow into streams or could potentially create a mine "blowout," which may result in rapid and sometimes catastrophic discharges of large amounts of stored mine water, often acidic in nature.

The Fairmont Mine Pool extends for more than 27,000 acres encompassing several pre-and post- SMCRA mines. These mines, which have filled with acidic water, threaten to discharge into the Monongahela River. EPA Region III, OSM, and West Virginia are cooperating on a study to delineate the extent of these pools, identify discharge points, and, ultimately develop strategies to prevent degradation of streams from potential discharges. During FY 1998, OSM installed a monitoring network of boreholes to assess the fluctuating pool levels and allow modeling of the hydrology of the pool. In FY 2002, OSM extended the monitoring network to other mined-out areas. Three new monitoring wells were drilled in the mine pool in FY 2003 to allow more comprehensive data collection. This study will assist Pennsylvania, West Virginia, other States, OSM, and EPA to evaluate possible solutions to protect the hydrologic balance from future "Fairmont Pools."

- Bond Approval and Administration: To ensure that bonds are sufficient to reclaim forfeited sites on permits situated on lands for which OSM has or shares regulatory authority responsibilities, OSM calculates bond amounts using engineering and science-based reclamation cost estimates. OSM also evaluates bond mechanisms posted with OSM to ensure legal, financial, and regulatory requirements are met. OSM provides technical assistance and training on bonding

activities, including the newly launched bond calculator software, and a technical review of any issues identified in a State program's bonding activities.

During FY 2002, OSM received about 65 requests for technical assistance on reclamation bonding from States, Tribes, other Federal agencies, and the coal mining industry. Approximately the same numbers of requests are expected in FY 2003, and again in FY 2004. Also, in FY 2002 OSM completed special on-site training for OSM engineers featuring the Bond Calculator software. OSM anticipates receiving several requests for specific on-site bonding technical assistance and training in FY 2003, and the same for FY 2004.

- AMD Treatment: At the request of West Virginia and Pennsylvania, an interagency team is developing software that will accurately calculate annual treatment costs for sites that have discharge pollution. This program will assist the states in determining bond adjustments, watershed groups in planning for restoration projects, and industry in determining budgets for water treatment. The program is currently in beta testing by potential users and will be made available for application in early FY 2004.

c. Mine Map Repository

OSM maintains a mine map repository authorized under the former Bureau of Mines and subsequently transferred to OSM. This repository, located in OSM's Appalachian Regional Coordinating Center in Pittsburgh, Pennsylvania, maintains the only national inventory of maps of abandoned coal and non-coal mines throughout the United States. Mapping information is used to fulfill customer requests for unique information that can range from rare maps for small uncommon projects to a national collection for assisting in large interstate projects. OSM customers include State regulatory and reclamation staff, local government agencies, developers, engineering and mining companies, architects, universities, law firms, environmental consultants, pollution control boards, realtors, law-enforcement agencies, historical societies, and homeowners. Some of the costs for this program are paid out of offsetting receipts from the sale of maps.

The OSM is automating the repository operational process. The new technology will enable OSM customers to retrieve mine maps and related information more efficiently via the Internet. Future enhancements are planned through partnering with the United States Geologic Survey (USGS). Operating revenues will increase into 2004 due to a new and revised fee schedule for business clients.

d. Small Operator Assistance Program (SOAP)

Section 507 (c) of SMCRA provides that up to \$10 million may be appropriated each year from AML fees to assist eligible small operators to meet the costs of regulation. SOAP pays some costs of obtaining the hydrologic, geologic, and other environmental information needed to prepare coal mining permit applications. Regulatory authorities

contract with public and private laboratories to collect the data and provide the environmental analyses. Mine operators with annual coal production of less than 300,000 tons per year are eligible for assistance under SOAP.

States with approved regulatory programs are responsible for administering SOAP. They receive grants from OSM to pay qualified laboratories to provide the authorized technical services. OSM is responsible for SOAP programs in non-primacy States such as Tennessee. In FY 2002, six State SOAP programs (Alabama, Kentucky, Maryland, Ohio, Pennsylvania and West Virginia) assisted 107 operators. The program generates benefits for AML around 5 times its costs because the small operators pay AML fees, and also remine and reclaim abandoned mine lands which would otherwise be eligible for AML funding. The program is expected to operate at a similar level in 2004.

e. Permitting

Western Region Coal Mine GIS: An Internet Map Server system has been implemented for five western mines that allows OSM Western Region users to access high resolution satellite imagery of each mine permit. As additional image acquisitions are made, users will be able to compare changes in each mine over time. The system will streamline regulatory inspection, tracking, and permitting. OSM intends to pursue a licensing agreement with the image data providers so that we can allow authorized States, Tribes, mine operators and other federal agencies to access the system in FY 2003.

Tennessee GIS: The Knoxville Field Office Geographic Information System (KFO GIS) is the only federal repository of coal mining geographic data sets for mining operations located within Tennessee. OSM, the mining industry, and the general public use these spatial data sets of coal mining-related impacts to visualize and understand the relationships of coal mining operations to the environment. In FY 2002, KFO GIS responded to 82 internal and external user requests, providing approximately 564 information products and services. In 2004 the Knoxville Field Office plans to expand the GIS database and begin acquiring spatial data to digitally map the extent of underground coal mining in Tennessee.

Mobile Computing: The OSM continues efforts in applying mobile computing devices and software to permitting and AML field work. The technology allows Inspectors to take maps and permit text data to the field for inspection and verification of mining and permitting activities. The application of AML design and re-design in the field is also being applied along with traditional methods to eventually integrate mobile computing as a tool in AML work. The technology is very encouraging and once devices and software have stabilized, will be transferred to our customers. This technology will result in a more efficient means of implementing the SMCRA. In 2004 we plan to expand this technology's use and availability.

f. Technical Innovation and Professional Services (TIPS)

The goal of TIPS is to provide State and OSM personnel with a comprehensive set of analytical tools to aid in technical decision-making processes related to the SMCRA. Services include: providing the technical tools to complete regulatory and reclamation tasks faster and more accurately, ensuring that the tools allow for electronic sharing of data, providing a comprehensive training program in core software for users, providing core-software tools at the user's desktop; conducting the necessary research and development that ensures that core software is the state-of-the-art; and providing technical assistance in software and hardware use. Customers include states, tribes and OSM offices nationwide.

The system is comprised of off-the-shelf computer hardware and software supported by OSM in partnership with the States and Tribes. TIPS consists of Windows-based computers at State, Tribal, and OSM offices with access to system license servers via the Internet. The software that the system provides covers a wide range of subjects necessary to assist technical staff in carrying out their duties in both the environmental protection and restoration programs under SMCRA. There are 19 commercially available software applications covering geospatial, hydrology, engineering, and statistical topics. These applications assist in the technical decision-making associated with conducting reviews of permits, performing hydrologic assessments, quantifying potential effects of coal mining, preventing acid mine drainage, quantifying subsidence impacts, measuring revegetation success, assisting in the design of abandoned mine land reclamation projects, and providing the scientific basis for environmental evaluations.

Examples of OSM TIPS related projects include:

Remote Sensing: TIPS began exploring the application of this new technology in 2001 in response to customer requests. Remote sensing tools allow SMCRA authorities to evaluate the effects of mining and reclamation with airborne and satellite images. Such information triggers a timely application of remedial measures resulting in faster and more effective reclamation.

TIPS is supporting the use of high resolution satellite imagery by state regulatory agencies in 5 eastern states by providing over 500 km² of imagery for pilot project purposes. All imagery was acquired, processed, and delivered to the state personnel in FY 2002. Stereo viewing hardware and image processing software were also deployed. At the end of the FY 2002, state personnel had used the image processing software for over 300 8-hour days. TIPS also hosted 10 state personnel for a 4-day remote sensing training class in Denver to train them on the use of the software and imagery. An extensive publication detailing the applications of the imagery in the Appalachian region will be published in 2003 as a result of these efforts.

TIPS received a 2nd place award for "Innovative Uses of Geospatial Technology" from *Geospatial Solutions Magazine*. Entries were submitted by 37 government and private organizations from around the world highlighting innovative uses of GIS, GPS and

remote sensing technology. TIPS received the award for the use of imagery as an inspection tool at the western mines.

TIPS staff made 14 presentations at various OSM, professional society, and government meetings about the use of remote sensing technology for SMCRA enforcement. Acquisition of remote sensing imagery is a major cost factor in the TIPS budget. These acquisitions will continue into 2004.

Hydrologic Impact Analysis: In recognition of the on going sensitivity of issues arising from concerns for the impacts of coal mining on water, during the last several years TIPS has sought to expand and enhance the tools available to professionals responsible for SMCRA regulatory decision making. In FY 1999, TIPS spearheaded a search for software applications to assist these professionals analyze the hydrologic impacts of past, current and future mining on the quality and quantity of surface and ground water. TIPS selected and sponsored a State-Federal team to conduct the search. This team identified six software applications to augment the three available applications to serve as Core Hydrology Software. In FY 2000 TIPS obtained and began distributing this suite of software applications. During 2001 through 2003, OSM developed and implemented a plan for the phased development and offering of specialized training on these applications for AML and permitting professionals. This effort will continue in 2004.

The Enos Refuse Area Project: Software from the TIPS program will be used in a cooperative project between OSM and the Indiana Department of Mines, Division of Reclamation to design a passive treatment facility intended to abate acid mine drainage from a large, abandoned, coal-processing waste disposal area in Pike County, Indiana. In FY2001 and 2002 the site was evaluated with the aid of AquaChem software provided through TIPS. In FY 2003 and 2004 Autodesk Map 5 and SurvCADD XML software will be employed to design passive treatment facilities that will include such technologies as vertical flow wetlands and aerobic wetlands to remove pollutants prior to discharge into the South Fork of the Patoka watershed.

TIPS Website: The TIPS website (www.tips.osmre.gov) provides information about TIPS, including current TIPS training classes, descriptions of TIPS software, access to digital data files for public domain TIPS software, lists of TIPS specialists, standardized AML emergency design drawings, and digital topographic maps for coal-producing areas within the United States. Upgrading and improving the website and its capabilities will continue into FY 2004.

g. Reclamation Support Activities

Mountaintop Mining/Valley Fill EIS:

Several key technical studies for the EIS are based on geospatial analysis using TIPS geographic information system (GIS) tools. In particular, OSM utilized TIPS-provided GIS software in FY 2002 and 2003 to assist in conducting the MTM/VF EIS Future

Mining Study, Valley Fill Inventory, Stream Study, Macroinvertebrate Study, Ephemeral/Intermittent Point Study, and Cumulative Impact Analysis. Use of TIPS GIS tools produces map and information displays that help the readers of the draft EIS to better understand the scope of past and present mountaintop mining activities, including valley filling practices; the amount of headwater streams filled; the extent of forest impacts; as well as the influence of mining and other human activities on downstream water quality, benthics, and other physical stream characteristics. Following the public comment period on the draft EIS in mid-FY2003, additional TIPS analysis may be needed to support finalization of this EIS in 2004.

Enhanced Contemporaneous Evaluation of Reclamation: As part of an effort to more effectively evaluate reclamation as it occurs at each mine, inspectors from OSM with assistance from technical specialists are using GPS units to locate the boundaries and input data for the areas as they are reclaimed. The field data (slopes, topsoil depths, etc) are subsequently downloaded into a GIS under development for each mine. This process will enable the OSM, States and industry professional and technical staff to keep track of the status of reclamation on each acre of mined land as it occurs. The continued success of this method means that OSM plans to expand its use through FY 2004.

h. Applicant/Violator System (AVS)

The Applicant/Violator System (AVS) is an informational database OSM maintains to support many types of research and program efforts but primarily in support of permit eligibility determinations under section 510(c) of SMCRA. As part of the permit review process, State and Federal regulatory authorities use the information contained in the AVS to evaluate an applicant's mining and violation history in order to determine the applicant's eligibility to engage in surface coal mining operations. OSM responds to approximately 3,500 requests per year for these evaluation reports. The AVS is also used to determine the eligibility of potential recipients of AML reclamation contracts and grants under the Small Operator Assistance Program.

AVS Office staff provides services to other customers including the coal industry, citizens groups, and other Federal agencies. Some of the services provided include: providing software and technical assistance for customers wishing to access the AVS from a personal computer; updating information in the AVS for coal companies that mine in more than one State; providing basic and advanced system training; and providing investigative assistance to others on complex ownership and control issues. These and other activities will be continued throughout 2004.

Ownership and Control Rule: Based on settlement negotiations with the National Mining Association, OSM was required by the court to issue proposed changes to the 2000 final rule. During 2003, OSM will propose changes to those rules. During 2004, OSM will finalize changes and focus on implementation of the final "Ownership and Control" and related regulations by providing assistance to the states in the form of training, program review, and implementation strategies.

E-government Initiatives: During 2004, OSM will continue efforts for a redesign of system software incorporating improved user-friendly technologies, including a web-based application. MINE.gov, a portal to provide customers “one-stop” access to mining related data from Federal and State sources, is a new concept that may satisfy part of this need. This cross agency initiative is in response to the Presidential e-government mandate. The AVS Office will continue to establish partnerships among OSM, other Federal and State agencies, the coal industry, and citizens for MINE.gov development and guidance.

As an example of the potential functionality of MINE.gov, several OSM units, including the AVS Office, are partnering with the Interstate Mining Compact Commission, the Internal Revenue Service, the Mine Safety and Health Administration, and the Small Business Administration in the development of a pilot program that will allow industry to report tonnage and other production information on a single electronic form. Several coal companies volunteered to participate in the pilot program during the fourth quarter of 2002. In 2003, the AVS Office, will partner with the Mine Safety and Health Administration to produce a joint business case for the MINE.gov project. During 2004, the implementation of the project will proceed with the introduction of expert tools. Such tools, currently under development, will allow the user to aggregate and compile mining information across State and Federal agencies resulting in improved citizen services and agency decision-making.

AVS Website: The AVS website (www.avs.osmre.gov) provides general information about the system, including how to get system access and technical support; provides access to the Ownership and Control Rule, the AVS Users Guide and System Advisory Memorandums; and allows AML Contractors to download necessary forms to obtain a permit eligibility check. In addition, interested parties may request to receive an electronic organization structure report for a coal company. The AVS Office is designing a basic system training course that will be accessible from the website in 2004.

2. Technical Training

Of the \$2.3 million for Technical Training, \$2.0 million of the funds support OSM's Environmental Protection activities and \$0.3 million support Environmental Restoration activities. Training provided ensures OSM, State, and Tribal staff possess the necessary knowledge and skills to implement the Surface Mining program. This subactivity is an integral component of OSM's Restoration and Protection business lines and supports the Department's Resource Protection and Use goal areas.

a. National Technical Training Program

OSM established the National Technical Training Program in 1985, recognizing the need for an ongoing educational program to increase the technical competence and professionalism of Federal, State, and Tribal personnel. The program delivers training related to permit approval, bond release, reclamation, and enforcement. The training received serves to update technical expertise and fosters consistent application of standards. Training is provided in each of the disciplines involved in implementation of SMCRA, which include engineering, hydrology, blasting, agronomy, and botany. The program also ensures training is available to enable SMCRA staff to maintain the ability to gather and present information as an expert with the most recent data available. In addition, periodic training is needed to disseminate the latest technological and the other changes in regulatory and associated reclamation activities.

All aspects of the program from identification of needs through course development and presentation are cooperative efforts of State, Tribal, and OSM offices. In FY 2002, 82% of students were from States and Tribes; 16% from OSM; and 2% from the public. Of the 28 State and Tribal programs, 20 have fewer than 50 employees and another 5 have fewer than 100 employees. There is an economy of scale achieved by the pooling of State and Federal resources that allows instruction in a wide variety of subjects each year for all State, Tribal, and OSM programs. By pooling and coordinating resources, the National Technical Training Program has been able to provide a unique and critical resource to States and Tribes that neither OSM nor the States/Tribes could provide individually.

In FY 2002, a new course, *SMCRA and the Endangered Species Act*, was piloted to facilitate implementation of the 1996 Biological Opinion that was issued to OSM by the U.S. Fish and Wildlife Service (USFWS). This course, which was developed in conjunction with USFWS, provides information on how requirements of the Endangered Species Act are integrated into the SMCRA permitting process. *Advanced Blasting: Investigation and Analysis of Blasting Effects* was also piloted. This course enhances student skills in gathering and analyzing blast-related information and will assist in resolving citizen complaints from ground vibrations, air blasts, fumes, and flyrock. A new course for AML students, *Acid-Forming Materials AML Workshop*, brought together experts to exchange information on reclaiming problematic areas in the Midwest. This course will be adapted in FY 2003 for Eastern States. Another new FY 2002 offering

was *OSM Orientation for New Personnel*. This course familiarizes students with the missions of the Department of Interior and the Office of Surface Mining.

In FY 2002, in support of the e-Government initiative component of the Administration Management Plan, the training program made solid progress in making GPRA follow-up evaluations and other administrative processes available through the Internet. In 2003, OSM in conjunction with the States, initiated development of a pilot on-line training course to provide students with basic information on acid-forming materials prior to attending advanced acid-materials classes. Also, in FY 2002, the training program provided technical and logistical support for a highly successful State and Tribal benchmarking workshop on the PHC/CHIA process as well as a related seminar on performance measurement and strategic planning. The workshop was attended by 83 State, Tribal, and OSM representatives. The 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. OSM anticipates that similar additional workshops will be held in future years to address additional topics.

Future plans for the training program for FY 2003 and FY 2004 include development of new courses and continuing the benchmarking initiative with the States as mentioned above. New courses include *Passive Treatment Systems for Acid-Mine Drainage*. The course will include topics such as wetlands and anoxic limestone drain treatments. The audience for the course is permitting specialists, inspectors, and AML specialists. A new course on the *Basics of Mine Subsidence* will introduce non-technical staff to basic concepts related to mine subsidence and the surface effects of underground mining. The audience for this course is managers, attorneys, and non-technical program staff who would benefit from a general understanding of the subject. A refresher course for instructors will be updated to enhance their delivery skills. And, a course in *Quantitative Hydrogeology: Theory and Application* will be developed to provide students with an introduction to using quantitative methods to describe ground-water flow and transport. Upon course completion, students will be able to apply the methods to conduct impact analyses, field investigations, and computer modeling. The course is targeted for hydrologists, geologists, engineers and others who routinely work with ground-water issues and will be tailored to coal mining hydrology. In keeping with the e-Government initiative, we will also pursue making additional materials, such as components of the Orientation course, available on-line.

In FY 2002, the Technical Training Program provided 49 sessions of 36 courses to a total of 932 participants at 30 locations in 12 different States. The 932 students trained exceeded the program's goal of 900 students, and resulted in a 96 percent customer effectiveness rating, exceeding its target of 90 percent. In FY 2003 and FY 2004, OSM plans to meet its target goals.

b. TIPS Software Application Training

TIPS established a software application training program specific of the use of the software in Title IV and V applications, including permitting analysis, AML reclamation design, construction and monitoring. TIPS software training is a cooperative State-Federal effort: 21 of the 45 current TIPS instructors are from State programs.

In FY 2002, 500 technical professionals from the States, Tribes, OSM, and industry were trained in 59 classes under the TIPS computer applications training program. Thirty of these classes were held at OSM's regional computer training facilities. Ten of these classes were conducted at customer sites. The table below shows the various courses conducted at the TIPS regional training centers and customer sites. These classes are specially designed to address mining specific applications, as requested by TIPS users and the TIPS steering committee, and therefore are uniquely different from courses available from the vendors. Nineteen sessions of on-line GIS classes were offered through ESRI Virtual Campus. These classes prepared TIPS customers in GIS basics as prerequisites to reclamation-specific TIPS GIS classes.

TIPS Customer Courses Conducted in FY 2002

COURSES
Global Positioning Systems (GPS)
ArcGIS (geographic information system)
ArcView(GIS)
Computer-Aided Design Applications
Statgraphics (Statistics software)
Groundwater Vistas
Galena slope stability
SurvCADD (landform model)
AquaChem (water quality)
SDPS (subsidence prediction)
Aqtesolv (ground water model)
SedCAD (surface water sedimentation)
GIS Online Courses

For FY 2003 and FY 2004, the TIPS training program plans on scheduling 30 classes to be held at regional training centers each year, with at least 10 classes conducted at trainee sites per year. Also, additional e-Training courses will be offered in GIS, CAD and GPS software

In FY 2002, the TIPS training program exceeded its target customer satisfaction rate of 88 percent by 3.5 percent, for an average satisfaction score of 91.5 percent. In FY 2002 and FY 2003, OSM intends to meet its respective 88 and 89 percent customer satisfaction goals for each year, and to provide training for approximately 800 students in each year.

c. Regional/Site Specific Training

OSM has regional training centers, which offer classes on customer requested topics and provide facilities for the national training program to minimize expenses. In FY 2003 and FY 2004, examples of such training may include:

- Tribal Training: OSM offers training to tribal staff in formal OSM training classes (NTTP and TIPS) as well as through courses offered by State universities and attendance at OSM forums and workshops. This effort is carried out under provisions of the Energy Policy Act of 1992, which includes:
 - (1) Courses relating to SMCRA to assist the tribes (Navajo, Hopi, Crow and Northern Cheyenne) in their development of regulations and programs for assuming the regulation of surface coal mining and reclamation operations on Indian lands.
 - (2) Courses to enable the tribes to assist OSM in the inspection and enforcement of surface mining activities on Indian lands, including, but not limited to, permitting, mine plan review, and bond release.
 - (3) Courses in the use of TIPS provided software and technology.
- Regression Time Series Analysis of Hydrology and Soils Data. The workshop provides advanced statistical analysis. In FY 2004, statistical expertise will become more important as a tool for final bond release applications in the West being considered by OSM and the States. OSM will continue to provide on demand advanced applied statistics workshops dealing with soils, vegetation, and hydrology issues in the arid and semi-arid western States.
- Electronic Permitting Workshop: In support of paperless permitting initiatives in FY 2002, OSM conducted a two day Digital Image in Mining Reclamation workshop, and a one day/two part, GIS and Digital Imagery workshop. In FY 2004, OSM plans to conduct an interactive forum and exhibition in support of paperless permitting. The forum will feature case studies and examples of electronic permitting. The exhibition will feature innovative technologies relating to electronic permitting, paperless permitting, digital imaging, and e-Government.

3. Technology Transfer

Of the \$3.2 million requested, \$1.7 million of the funds for technical transfer support OSM's regulatory program activities and \$1.5 million support OSM's abandoned mine land program. Technical transfer is an integral component of OSM's Restoration and Protection business lines providing national support to State and Tribal programs. Through the development of new technology and experimental practices this subactivity supports the DOI Resource Protection and Use goal areas.

A sound technical development program ensures that the most current and valid scientific information is available to the industry, States, and Tribes. OSM plans to attain a 92 percent service rate in FY 2004.

a. Technology Development

OSM seeks to meet the needs of State, Tribes, and all OSM staff, as well as the public and the coal industry by solving problems related to reclamation projects, and regulatory implementation through cooperative research efforts with other bureaus. OSM does not fund research of its own. OSM's research needs are coordinated with the regulatory and research programs of the USGS and other Federal agencies having responsibility for or supporting environmental protection.

OSM participates on the Department of the Interior's Base Mapping Needs Committee to coordinate OSM's mapping needs with other Interior bureaus. The Base Mapping Needs Committee ranks and funds mapping requests based on multi-party needs; current work includes the 2004 National Map pilot project in Colorado.

OSM works with the academic community and private research organizations to identify potential areas of cooperation. The National Mine Land Reclamation Center (NMLRC), located at West Virginia University, receives funding from several Federal and State agencies including OSM and industry organizations to research solutions to environmental problems associated with coal mining.

An industry/government (State and Federal) academic task force developed joint action plans to define "best science" practices that are expected to solve acid mine drainage problems, and to work toward implementation of those practices through the coalfields. Cooperative efforts involving many agencies, groups, and individuals are implementing the Acid Mine Drainage Technology Initiative (ADTI). NMLRC acts as the coordinator.

b. Electronic Permitting

The goal of Electronic Permitting is to obtain computer-generated permit applications in which all text, baseline data, models, drawings, and maps are in electronic media. As a long-term program that has significant monetary and time savings, electronic permitting provides more complete and up-to-date records for those involved in the permitting

process. Currently, OSM is assisting primacy States in development and implementation of electronic permitting.

Electronic permitting provides State, Tribal, and OSM permit reviewers with computer-based tools to access electronic documents, maps and data, and to perform necessary environmental analyses. Electronic data and information can be downloaded directly onto computer systems, where users can access the computer databases and analytical software, such as those provided by TIPS, making data manipulation and analyses more efficient and accurate. Electronic permitting saves staff time by reducing many “clerical” aspects of accessing and transferring hard copy information. Additional benefits include the ability to share computer-based data with managers, field personnel, other agencies, the public and industry.

In FY 2004, OSM plans to continue to (1) coordinate activities with primacy States, tribes and industry; (2) sponsor interactive forums, training and workshops for primacy States, tribes and industry; and (3) expand Federal/Industry electronic data exchange initiatives. OSM will support electronic permitting initiatives of States by concentrating on their needs in the area of data conversion, acquisition and storage, and interpretation of remote sensing data.

Examples of electronic permitting achievements include the following:

- *Alabama* – The Alabama Surface Mining Commission (ASMC) is receiving EP through e-mail and CD submissions. The State has established a GIS for the coalfields and is actively incorporating EP information into the system.
- *Alaska* – Having approved a fully electronic permit, the staff is in the process of improving its existing permitting database *Coal Permit Information Tracking System* (CoalPITS), using the Colorado template. The resulting database will enable the staff to track all permitting activities including inspection and enforcement, disturbance and reclamation, as well as store maps and imagery. The database will also be available to the users on the OSM network.
- *Colorado* – In FY 2002 Colorado completed a digital imaging project converting into electronic format all the paper maps and permit related documents for all mines with active permits, in addition to those in reclamation or cessation. Colorado’s permitting staff continues to populate and use the MS-based workflow database that tracks permitting information and generates electronic reports and correspondence automatically.
- *Kentucky and Virginia* – Permits are now processed electronically routinely. All permit applications are electronically routed and reviewed from submittal to approval. Permit applications can be delivered electronically or in hard copy, in which case they are scanned into the office network by State personnel.

- *Montana* – In the process of converting its permit and annual report maps database into a digital paperless system, the staff have assembled over 100 electronic maps. Five mines are reporting the hydrologic information electronically, and two mines are submitting annual reports electronically.
- *North Dakota* – Following the success in approving the nation’s first paperless permit, North Dakota’s partnership with their coal industry continues exploring the use of digital tools. A second paperless permit in electronic format has been approved and another mine is converting all its paper documents into electronic format, in preparation for a paperless permit application submittal. These paperless coal mine permits are to be found on a CD-ROM on file at the Public Service Commission, at OSM, and at the County Auditor’s Office (the public access site). Each CD-ROM contains all the information normally contained in numerous three-inch binders and on many CAD maps and drawings. In addition, a mine in full reclamation and preparing for bond release, is converting all permit documents, data, and maps into electronic format to facilitate collaboration with the State Regulatory Agency.
- *Texas* – The coal industry in Texas has submitted all or portions of the permits in an electronic format. The State has jointly developed CAD standards with the coal industry for the submission of mapping information. The State utilizes the mapping and database information to conduct permit reviews and analyses such as cumulative hydrologic impact analyses.
- *Utah* – Twelve of the Utah coal operators have made informal CD permit application submittals, and one official amendment has been submitted on a CD. Utah currently retrieves water-quality information and reports water-quality data electronically for twenty-seven operations by means of either the Internet or e-mail. Utah is preparing mine permit information in GIS format, and will make these maps available directly over the Internet.

c. *Technology Transfer and Publications*

Technology Transfer is accomplished through a variety of activities. State technical representatives meet frequently with OSM regional staff to share resources whenever practicable to resolve regional technical issues. OSM sponsors or attends interactive technical forums, computer applications workshops, and technical seminars to address mining and reclamation environmental issues. After coordinating the need of States, Tribes, and industry, OSM plans and presents technical topic forums. The following describe types of workshops and forums.

Mountaintop Mining and Valley Fills (MTM/VF) EIS Stakeholder Outreach: Development of an EIS is an open and interactive process. To prepare this EIS, more than 30 technical studies were conducted on a wide variety of technical topics. OSM and EPA sponsored several workshops during FY 2002 and 2003 to disseminate new technical information on MTM/VF impacts to the public and to receive peer review

feedback on the studies. These events were held throughout West Virginia with attendees from state and federal regulatory responsibility for coal mining, coal mining companies and their technical consulting firms, environmental community, and the public. The most recent forum was held by OSM on the EIS economic studies in early FY 2003. Additional public outreach and technology transfer will occur in FY 2003 following release of the draft in Spring 2003. OSM also will post the draft EIS and the many study results on the web during mid-FY 2003. If additional studies are required (i.e., based upon public comments on the-draft), similar processes to disseminate information will occur prior to publication of a final EIS. Such efforts would extend into FY 2004.

Reforestation Initiative: OSM continues its effort to encourage reforestation practices that would increase the amount of mined land reclaimed as forest. This effort has resulted in technical and policy symposia, a website, speaking at professional organizations, and publications that transfer state-of-the-art science and technology. A technical interactive forum on Market-Based to Mined Land Reclamation and Reforestation was conducted in 2002. 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 through sequestration in forests. This activity is of interest to mine operators, utilities, land management companies, mining companies, environmental organizations, and provides the opportunity to promote ecologically diverse balanced forest ecosystems. A 20-minute video promoting the technical feasibility of reforestation of mined lands was produced and released by OSM during 2002. An Outreach Packet outlining the benefits of reforestation and designed to attract the attention of these potentially interested parties has been published and a more technical manual will be released by FY 2004.

Bond Release: The last in a series of five Interactive Bond Release Forums on Arid and Semi-Arid Areas titled *Approaching Bond Release: Post Mining Land Use in the Arid Semi-Arid West* was held in Bismarck, North Dakota, in August of 2002. OSM will continue co-sponsoring bond release forums in FY 2004 and subsequent years because of increased permitting activity in the west and increased bond release inspections. The states are continuing to encounter new issues needing discussion and resolution in all regions and find the interactive technical forums a suitable format. Proceedings of the previous interactive bond release forums are available on the OTT website (www.ott.wrcc.osmre.gov/library/proceed.htm).

Coal Combustion By-Products (CCB): OSM has successfully pioneered numerous technology transfer events and products on this topic beginning with its first national technical interactive forum in 1996. Examples of activities during FY 2002 include: OSM conducted its 3rd technical interactive forum on coal combustion by-products; updated and maintained its informational website, including proceedings from the workshop and other new information (<http://www.mercc.osmre.gov/ccb/>); and served on a national steering committee to review proposals for CCB recycling. During 2002/2003, OSM will continue its assistance to ASTM in the development of new standards for

testing Coal Combustion By-Products that would be used in reclamation at mine sites, and its efforts with other organizations in this area.

Bat Conservation and Mining: The OSM sponsored Bat Conservation and Mining Steering Committee has been responsible for conducting two technical interactive forums, publishing proceedings, and development of an informational Website. During FY 2002, OSM cosponsored a technical interactive forum entitled “Bat Gate Design.” The purpose of this forum was to develop a “State of the Science” manual on the design, construction, installation and management of bat gates. The OSM sponsored Bat Conservation and Mining Steering committee was awarded the 2002 DOI Environmental Achievement Award for its efforts in this area.

Reports, Forum, and Workshop Proceedings: OSM publishes and co-sponsors the publication of numerous forums and workshop proceedings and various topical reports. These publications are distributed to interested parties at technology transfer events, upon request, and at various websites maintained by OSM. The agency uses the Internet to make available and seek comments to its reports and technology transfer products for as wide a client audience as possible. In FY 2003 and 2004, OSM will continue to develop, distribute, and communicate these products.

OSM Technical Library: OSM maintains technical libraries provides access to technical, scientific, and legal information for the agency, States, tribes, industry, citizen groups, and the public through a variety of services, reference assistance, technical research, document delivery, and the dissemination of critical current awareness information. The libraries anticipate that by being on the web, the use of the collection will increase significantly. In addition, it is projected that the Libraries will receive approximately 350 publication requests in FY 2003 and again in FY 2004. As well as providing technical information and services to State Regulatory Agencies and other OSM customers on a variety of mining-related topics, the technical library shares its collection through interlibrary loan with libraries around the world. In order to provide worldwide access to the information resources in the collection, the library catalog is web-accessible to anyone with Internet access. Additional library information may be found on the web at www.ott.wrcc.osmre.gov/library.htm.

d. Experimental Practices Program

Section 711 of SMCRA allows variances from Sections 515 and 516 performance standards as alternative or experimental mining and reclamation practices to encourage advances in mining technology or to allow innovative industrial, commercial, residential, or public (including recreational) post-mining land uses. However, the experimental practices must be at least as environmentally protective as the performance standards promulgated under Sections 515 and 516 of SMCRA. The experimental practice also must not reduce the protection afforded public health and safety below that provided by the applicable performance standards. Approval and monitoring of a permit containing an experimental practice requires a close working relationship between the operator, the regulatory authority, and OSM.

Since the inception of the program, 40 experimental practices have been approved. Sixteen were determined to be successful and three unsuccessful; sixteen are currently underway; one was terminated due to regulation change, and four have been completed but final reports not yet received.

OSM received six new experimental practices from Alabama, Virginia, Pennsylvania, West Virginia, and Kentucky in FY 2002. An additional 10 applications are anticipated in FY 2003, all from Kentucky, West Virginia, and Virginia. It is likely that the interest in experimental practices will continue at the same level in FY 2004.

e. Educational Outreach

To make the public and students aware of OSM's responsibilities and of its environmental stewardship mission, OSM staff provides educational outreach to science teachers associations, science classes, educational fairs, Earth Day events, career days, foreign visitors, grassroots organizations, and professional associations and societies. This outreach includes demonstrating phases of surface mining reclamation using an open-pit mine model with reclamation equipment and activities in place, as well as providing educational posters and materials involved in permitting, monitoring and reclaiming a mine site. Additional outreach is provided through publications and distribution of forum proceedings, such as the *Approaching Bond Release: Revegetation, Reclamation Issues, and Surface Mining Applications in the Arid and Semi-Arid West*; the *Boy Scout Mining Information Handbook*; *Wildlife Habitat Construction and Wildlife Use of Reclaimed Lands in the Arid and Semi-Arid West*. Conversion of important technical documents into electronic format, such as the *Handbook of Western Reclamation Techniques*, and *Sagebrush Establishment on Mined Lands: Ecology and Research*, and compilations of technical information such as OSM's Mid-Continent Regional Coordinating Center's Comprehensive Technology Transfer CD, further assist with their dissemination. Assisting in the integration of the *Handbook of Western Reclamation Techniques* into university curricula is made easier as the above documents are also made available on OSM website. Outreach efforts will expand and continue in FY 2003 and 2004.

FY 2002 PROGRAM PERFORMANCE ACCOMPLISHMENTS

In 2002, the major accomplishments in the Technology Development and Transfer program activity include:

- The Small Operators Assistance program helped 107 small coal mine operators collect technical data needed for mine permit applications.
- National Technical Training Program (NTTP) offered 49 sessions of 36 different courses in addition to regularly scheduled courses in response to specific requests. Special course offerings included: NEPA procedures course for Navajo students, and a special Bonding Workshop session in Virginia.
- NTTP provided technical and logistical support for a state and tribal benchmarking workshop on the Probable Hydrologic Consequences/Cumulative Hydrologic Impact Analysis attended by 83 Federal, State, and Tribal representatives.
- The Technical Innovation and Professional Services offered eight on-line training courses for the first time in 2002.
- Technical library staff responded to more than 325 requests from state regulatory staff, other federal agency staff, citizens, coal industry, consultants, and academics.
- OSM held three National Technical Interactive Forums were conducted on “Coal Combustion By-Products and Western Coal Mines; Bat Gate Design; and Market-Based Approaches to Reclamation and Reforestation.”

	2002 Planned	2002 Actual	Change	Reason for Change/Comment
Customer service rate in the quality of technical assistance.	92%	98%	+6%	Exceeded performance target.
Customer satisfaction in the quality and timelines of Applicant Violator System (AVS) provided services.	90%	97%	+7%	Exceeded performance target.
Customer effectiveness rate in the quality of technical training (NTTP).	90%	96%	+6%	Training courses address real issues participants deal with on their jobs.
Number of Students trained (NTTP).	900	932	+32	Exceeded performance target.
Customer satisfaction rate for TIPS training.	88%	91.5%	+3.5%	Exceeded performance target.

FY 2003 PLANNED PROGRAM PERFORMANCE

- OSM will provide TIPS training for approximately 800 students.
- Technical library staff respond to 350 publication requests from state regulatory staff, other federal agency staff, citizens, coal industry, consultants, and academics.
- OSM will assist five to six Eastern states in the development of a consistent training and examination program for blasting personnel to facilitate a reciprocity agreement between these states.
- OSM will continue to participate in the Acid Drainage Technology Initiative (ADTI) a collaborative effort among federal agencies, industry, the states, academia, and the National Mine Land Reclamation Center (NMLRC) to promote communication and technology enhancement in the field of acid mine drainage.
- In 2003, the AVS Office, will partner with the Mine Safety and Health Administration to produce a joint business case for the MINE.gov project, a portal to provide customers “one-stop” access to mining related data from Federal and State sources.
- NTTP will initiate pilot on-line training course to provide students with basic information on acid-forming materials prior to attending advance materials class.

	2002 Actual	2003 Planned	Change	Comments/Explanation of 2003
Customer service rate in the quality of technical assistance	98%	94%	-4%	OSM continues to strive for the highest possible customer satisfaction with technical assistance.
Customer satisfaction in the quality and timelines of Applicant Violator System (AVS) provided services.	97%	95%	-2%	The FY 2004 goal is increased to 95% based upon prior year performance data in excess of the previous goal of 90%.
Customer effectiveness rate in the quality of technical training (NTTP)	96%	90%	-6%	In 2004 will increase the customer satisfaction rate to 92% based upon prior years performance data.
Number of Students trained (NTTP)	932	900	-32	Goal represents the minimum amount of students to be trained annually.
Customer satisfaction rate for TIPS training	91.5%	89%	-2.5%	Goal is same as previous year's goal.

JUSTIFICATION OF 2004 PROGRAM CHANGES

Technology Development and Transfer	FY 2004 Budget Request	Program Changes (+/-)
\$(000)	16,933	-87
FTE	132	0

Program Changes:

Information Technology (-\$87) - The Department is undertaking significant information technology reforms to improve the management of IT investments, to improve the security of systems and information, and to realize short and long-term efficiencies and savings. The Department is taking a corporate approach that will include consolidated purchases of hardware and software, consolidation of support functions including helpdesks and email support, and web services, and coordination of training.

In addition to Department-wide efforts, the Bureau will explore further savings in information technology by fully participating in Departmental enterprising and capital planning projects, delaying system enhancements, consolidating bureau level services (i.e., servers and helpdesk), accelerating the acquisition of the MS Enterprise Licensing agreement, and reviewing life cycle replacements. In addition, potential savings may result from competitive sourcing studies.

FY 2004 TECHNOLOGY DEVELOPMENT AND TRANSFER PERFORMANCE

DOI Strategic Goal: Resource Use – Provide Access for Responsible Use and Optimal Value						
End Outcome Goal 2.1: Manage or Influence Resources to Enhance Public Benefit, Promote Responsible Use, and Ensure Optimal Value – Energy						
End Outcome Measure(s)	FY 2001 Actual	FY 2002 Plan	FY 2002 Actual	FY 2003 Plan	FY 2004 Plan	Change in Performance 2003 to Planned 2004
Ensure 94% of active sites are free of off-site impacts.	93.9%	94%	92.8% ¹	94%	94%	0
Number of acres released from phase III performance bonds.	81,853	75,000	73,407	70,000	70,000	0
Intermediate Outcome: Improve information base, resource management and technical assistance.						
Intermediate Outcome Measures	FY 2001 Actual	FY 2002 Plan	FY 2002 Actual	FY 2003 Plan	FY 2004 Plan	Change in Performance 2003 to Planned 2004
% satisfaction with technical assistance and training program.	99.6%	92%	100%	92%	92%	0
DOI Strategic Goal: Resource Protection – Improve Health of Watersheds, Landscapes and Marine Resources						
End Outcome Goal 1.1: Improve Health of Watersheds, Landscapes and Marine Resources						
End Outcome Measure(s)	FY 2001 Actual	FY 2002 Plan	FY 2002 Actual	FY 2003 Plan	FY 2004 Plan	Change in Performance 2003 to Planned 2004
Number of equivalent land acres for which degradation from past mining has been reclaimed.	13,808 ²	8,200	8,019 ³	6,900 ⁴	6,900	0

DOI Strategic Goal: Resource Protection – Improve Health of Watersheds, Landscapes and Marine Resources						
End Outcome Goal 1.1: Improve Health of Watersheds, Landscapes and Marine Resources						
End Outcome Measure(s)	FY 2001 Actual	FY 2002 Plan	FY 2002 Actual	FY 2003 Plan	FY 2004 Plan	Change in Performance 2003 to Planned 2004
Number of stream-miles/ acres for which degradation from past surface coal mining has been reclaimed.	N/A	N/A	N/A	N/A	150 ⁵	0
Intermediate Outcome: Improve information base, resource management and technical assistance						
Intermediate Outcome Measures	FY 2001 Actual	FY 2002 Plan	FY 2002 Actual	FY 2003 Plan	FY 2004 Plan	Change in Performance 2003 to Planned 2004
% satisfaction with scientific and technical products and assistance.	94.6%	90%	96%	90%	92%	+2%

1\ In fiscal year 2002, we did not achieve the target by 1.2%. Overall on a state-by-state basis, the percent of sites free of off-site impacts remain high.

2\ FY2001 accomplishments reported by the States and Tribes included more than one fiscal year. OSM's calculated estimate for 2001 was 8,600.

3\ This is below the 2002 target goal; however, there is a delay in reporting projects completed by the states and it is anticipated that the goal will be attained when all on-the-ground reclamation is reported.

4\ FY 2003 performance reflects \$17.5 million decrease in regular (i.e. non-emergency and non-Clean Streams) grants to States and Tribes.

5\ Target represents the number of impounded acres of surface water to be improved.