TECHNOLOGY DEVELOPMENT AND TRANSFER

		2003 Actual	2004 Estimate	Uncontroll. & Related Changes (+/-)	Program Changes (+/-)	2005 Budget Request	Change from 2004 (+/-)
Regulation & Technology	$$$	12,511	12,593	179	715	13,487	894
	FTE	113	112	-2	0	110	-2
Abandoned Mine Land	$$$	4,137	4,133	24	385	4,542	409
	FTE	16	15	0	0	15	0
TOTAL	$$$	16,648	16,726	203	1,100	18,029	1,303
	FTE	129	127	-2	0	125	-2

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 Strategic plan mission quadrants (Resource Use and Resource Protection) 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.

In 2005, 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 related 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), the Applicant Violator System (AVS), Electronic Permitting (EP), and the Small Operator Assistance Program (SOAP). OSM also established an intergovernmental team, the National Technology Transfer Team (NTTT) to provide direction, communication and coordination of efforts related to technology transfer and development. This team is a permanent entity and will continue throughout FY 2005. Technology transfer is a major part of OSM's cooperative effort with States and Tribes.

TECHNOLOGY DEVELOPMENT & TRANSFER ENCOMPASSES:

Technology Development

Technology Transfer

Technical Training

Electronic Permitting (EP)

Technical Innovation and Professional Services (TIPS)

Applicant Violator System (AVS)

Small Operator Assistance Program Grants (SOAP)

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.

Actions Required to Achieve Annual Goals: In FY 2005, OSM plans to increase 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, the National Technical Training Program (NTTP), TIPS, 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. In addition, the newly established National Technology Transfer Team will provide direction, communication and coordination efforts related to technical issues and studies.

Resources, Skills, and Technology Needed: A goal for FY 2005 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 $18.0 million. The FY 2005 President's Budget requests $11.9 million for Technical Assistance (including the Applicant Violator System), of which $1.5 million for the Small Operators Assistance Program; $2.9 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 2005 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 1– Justification of Program and Performance
Technology Development and Transfer
Summary Increases/Decreases for FY 2005
(Dollars in Thousands)

Program Activity		Regulation & Technology			Abandoned Mine Lands			Total			Inc/Dec
		2003 Act.	2004 Est.	2005 Req.	2003 Act.	2004 Est.	2005 Req.	2003 Act.	2004 Est.	2005 Req.	
Technical Assistance	$$$	8,925	8,979	9,555	2,337	2,328	2,334	11,262	11,307	11,889	582
	FTE	78	76	75	4	4	4	82	80	79	-1
Training	$$$	1,972	1,984	2,272	239	243	634	2,211	2,227	2,906	679
	FTE	17	18	17	4	4	4	21	22	21	-1
Technology Transfer	$$$	1,614	1,630	1,660	1,561	1,562	1,574	3,175	3,192	3,234	42
	FTE	18	18	18	8	7	7	26	25	25	0
TOTAL	$$$	12,511	12,593	13,487	4,137	4,133	4,542	16,648	16,726	18,029	1,303
	FTE	113	112	110	16	15	15	129	127	125	-2

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 Resource Use goals.

OSM's stakeholders (States, Tribes, and industry) continue to express support for Technology Development and Transfer 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 $11.8 million requested, $2.3 million support OSM's Environmental Restoration and $9.5 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. These types of endeavors are integral parts of the Environmental Protection and Restoration business lines and are not included in the TDT program activity.

OSM intends to meet a 94 percent customer service rate for its technical assistance efforts in FY 2005. 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 sufficiency and bond release; 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; 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 2005 include:

- Mountaintop mining and valley fills: (MTM/VF) In late 1998, settlement of the Clean Water Act (CWA) litigation counts in 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. The draft EIS was published in May 2003 and the public comment period closed January 21, 2004. The agencies are presently reviewing comments and target finalizing the EIS and record of decision in FY 2005. 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). As a result, the agencies have increased scrutiny of proposed coal mining operation applications proposing valley fills and OSM has provided technical support to assist WVDEP in permit reviews.

- 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 were six reported unplanned discharges into underground mine workings from overlying impoundments. Four of these breakthroughs caused pollutional discharges to streams in Virginia, West Virginia, and Kentucky. The latest breakthrough occurred in October 2000 in Martin County, Kentucky. More than 300 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, entered the Tug Fork River, and continued flowing through the Big Sandy River until assimilated by the Ohio River over 70 miles downstream. Although there were no fatalities, significant property damage and aquatic impacts occurred. Municipal water supplies all along the path of the slurry were forced to seek alternative sources. A monumental environmental cleanup effort by the responsible coal company was required--approaching $60 million dollars. Civil suits and potential additional damage costs are still pending.

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) completed a Congressionally-directed study of technical issues related to impoundments above underground mines. OSM, in coordination with Appalachian States, evaluated high-risk mining-related impoundments over underground mines to ensure against future breakthrough incidents. OSM evaluated and began implementing appropriate recommendations from the NAS study.

During FY 2003, OSM and MSHA, in response to a Congressional request in the FY 2003 Omnibus Appropriations Act, submitted a progress report on impoundment review and related activities as well as actions taken relative to each of the NAS issues. The 2003 report to Congress included recommendations for future action on: review and approval of impoundment plans or permits; requirements for mine surveying and mine mapping in the vicinity of impoundments; and the use of geophysical methods to locate mine workings. Additionally, in July 2003, OSM sponsored an interactive forum for more than 200 attendees from government, industry, academia, and consultants on the use of geophysical methods for locating the extent of underground mine workings in Lexington, Kentucky.

In FY 2004 and 2005, OSM, the States, and MSHA will assess whether revisions to existing engineering practices are necessary as follow through from impoundment investigations and the NAS study. OSM and MSHA will continue cooperating with the states to address technical issues related to underground mining and surface facilities.

- 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 2004 and 2005, 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.

OSM will publish a revised Blasting Guidance Manual during FY 2004, in concert with the States and the technology transfer program. The manual will provide updated technical information on blasting technology, monitoring, complaint investigation, and enforcement investigations and should ultimately lead to reductions in blasting risk and complaints.

Beginning in FY 2004, OSM will assist several Eastern states and the countries of Jamaica and Indonesia 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 2005. 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 concerning the placement of CCBs at mine sites. This work will continue into 2005. 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 2004 and 2005, 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 the ADTI Coal Mining Sector's efforts to address the goals of prediction of potential sources of acid mine drainage, as well as avoidance or remediation of existing sources of acid mine drainage associated with coal mining. Ongoing projects that OSM is sponsoring in FY 2004 include:

  - Continued assistance in evaluating acid mine drainage producing sites, water quality, treatment designs and system evaluations and follow up monitoring of the performance of passive treatment systems installed under the Appalachian Clean Streams Program. This effort will include the analysis and summation of site evaluations of passive treatment systems constructed in recent years in order to classify the degree of treatment success or failure of the system. This information will then be used to develop decision-making criteria to guide in determining best-use practices for future passive treatment installations.

  - Continued development of 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.

  - Continued work to identify geologic sources of selenium associated with coal mines, understand and predict the chemistry governing the mobilization of selenium into coal mine discharges, and identify effective methods to predict, prevent and mitigate the offsite discharge of selenium-contaminated discharges.

During FY 2004, OSM will work with other ADTI partners to continue development and begin implementation of a five-year roadmap for future activities, with actions to begin implementation in late FY 2004 and refine these activities ongoing during FY 2005.

A major development for addressing AMD occurred in FY 2003, with the release of an OSM software application called AMD Treat. This product allows for the site-specific and accurate estimation of costs for treating pollutional discharges. The program was developed in FY 2003 and became a part of OSM's TIPS suite of computer programs. Revisions and updates will continue through FY 2004 and FY 2005.

Remining: In FY 2003 and 2004, OSM partnered with the EPA to develop remining regulations to encourage the mining industry to remine abandoned coal mine sites without adequate reclamation. Implementation of the rule will serve as an incentive for cleaning up old mines by using best management practices to achieve water quality improvement. Remining results in greatly improved reclamation of sites that would otherwise require AML funding for cleanup. The rule was published in FY 2003. Workshops were held throughout the coalfields to promote and explain the new rule to States and industry. Support to OSM States on outreach and implementation of the remining provisions will continue through FY 2005.

- 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 2005. Below are examples of the types of assistance provided to States and Tribes.

- Full-cost Bonding: At the request of the Pennsylvania Department of Environmental Protection (PADEP), 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 2005. Aerial photography can be very costly, but the savings realized in setting correct bond amounts outweighs the cost. OSM also conducted three special sessions of the AMD Treat TIPS training course for PADEP to assist the State in conducting site-specific bond adjustments for conversion of existing bonds to full-cost bonding of long-term treatment of pollutional discharges.

- Hydrologic Balance Issues from Underground Mining: Over a century of extensive underground coal mining in Pennsylvania and West Virginia left miles of interconnected, flooded workings that we call "mine pools." The water level in these mine pools may rise and overflow into streams. The pools could also potentially create a mine "blowout." Rapid and sometimes catastrophic discharges of large amounts of stored mine water may occur in either case. The mine pools may present dangers to life, property, and surface stream water quality.

  The Fairmont Mine Pool extends for more than 27,000 acres, encompassing several pre-and post- SMCRA mines. These mines have filled with acidic water and threaten to discharge into the Monongahela River. EPA Region III, OSM, and West Virginia are cooperating on studies 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 by serving as a model approach for evaluating possible solutions to protect the hydrologic balance from future "Fairmont Pools." In FY 2005 OSM will host an intergovernmental/interagency workshop to evaluate all research and monitoring efforts to date in an effort to partner together on solutions and next steps to address this issue.

In FY 2004, OSM and the States plan to explore the feasibility of developing a computer application that will model existing underground mine pools and predict potential flooding rates and discharge locations/amounts. If the application is deemed feasible, OSM will undertake development of this product, continuing into FY 2005.

- 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.

- Indiana Subsidence Team: OSM is participating on a team with the Indiana Division of Reclamation to develop methods for prioritizing underground mined areas and analyzing existing technology for subsidence prevention efforts. During 2004, the team is finalizing an information booklet entitled "Living Near Indiana Coal Mines" for distribution to property owners and developers in mined areas. The book is intended to educate and inform the public on important issues to consider when building and buying in mined areas. Indiana officials hope that a secondary outcome of the booklet is a reduction in the growth of the AML Inventory that occurs when people build new structures that are not properly designed for conditions in mined areas. The booklet will be published during 2004 and distribution will continue through 2005.

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 2003, 5 State SOAP programs (Alabama, Kentucky, Ohio, Pennsylvania and West Virginia) assisted 56 small mine 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 and FY 2005.

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.

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 2003, KFO GIS responded to 97 internal and external user requests, providing approximately 472 information products and services. KFO expects increases in user requests in FY 2004 and 2005. In FY 2004 KFO began to digitally map the extent of underground mine works in Tennessee. Several hundred mapped areas are planned to be completed in FY 2005.

Mobile Computing: 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 and 2005 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.

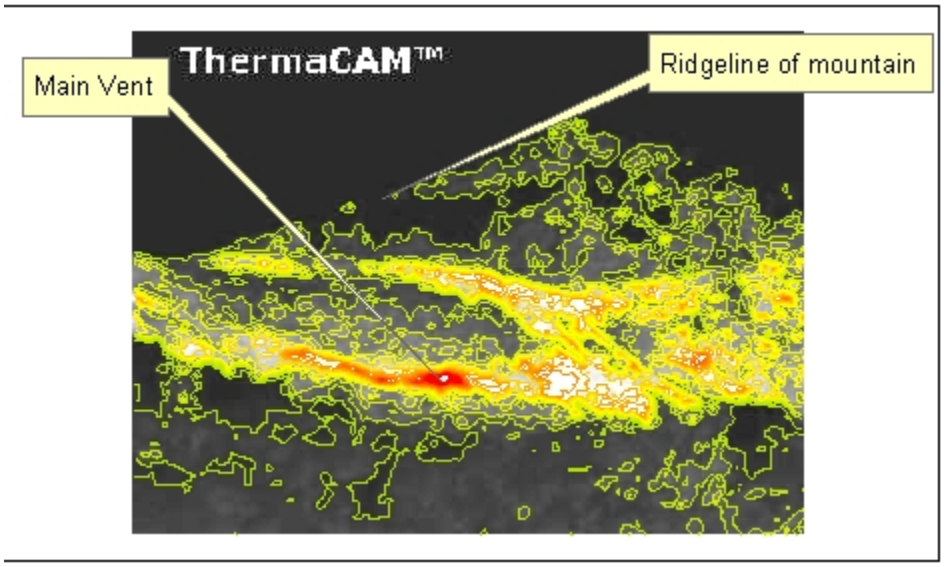
The system is comprised of off-the-shelf computer hardware and software supported by OSM in partnership with the States and Tribes. TIPS consists of Windows-based computers at State, Tribal, and OSM offices with access to system license servers via the Internet. The software that the system provides 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:

Thermal Camera: TIPS has acquired a thermal camera (ThermaCAM™ E4) for use in locating acid materials and coal fires. The ThermaCAM is a hand held device that can also be used from aircraft. More information is available on the TIPS Website at www.tips.osmre.gov. TIPS will make this device available to state and tribal agencies and OSM offices on a checkout basis.

Thermal images and graphs are stored in the camera until downloaded to a personal computer where they can then be used as base layers in a Geographic Information System, (GIS) or for inclusion in reports. Storage capacity is 50 jpeg-type images. The

camera records temperatures in the range of -20ºC to +250ºC (-4ºF to +482ºF) with an accuracy of ± 2ºC or ± 2% of absolute temperature in ºC. Thermal imaging is best performed in the cool winter months when ambient air temperature is least likely to interfere with measurements.



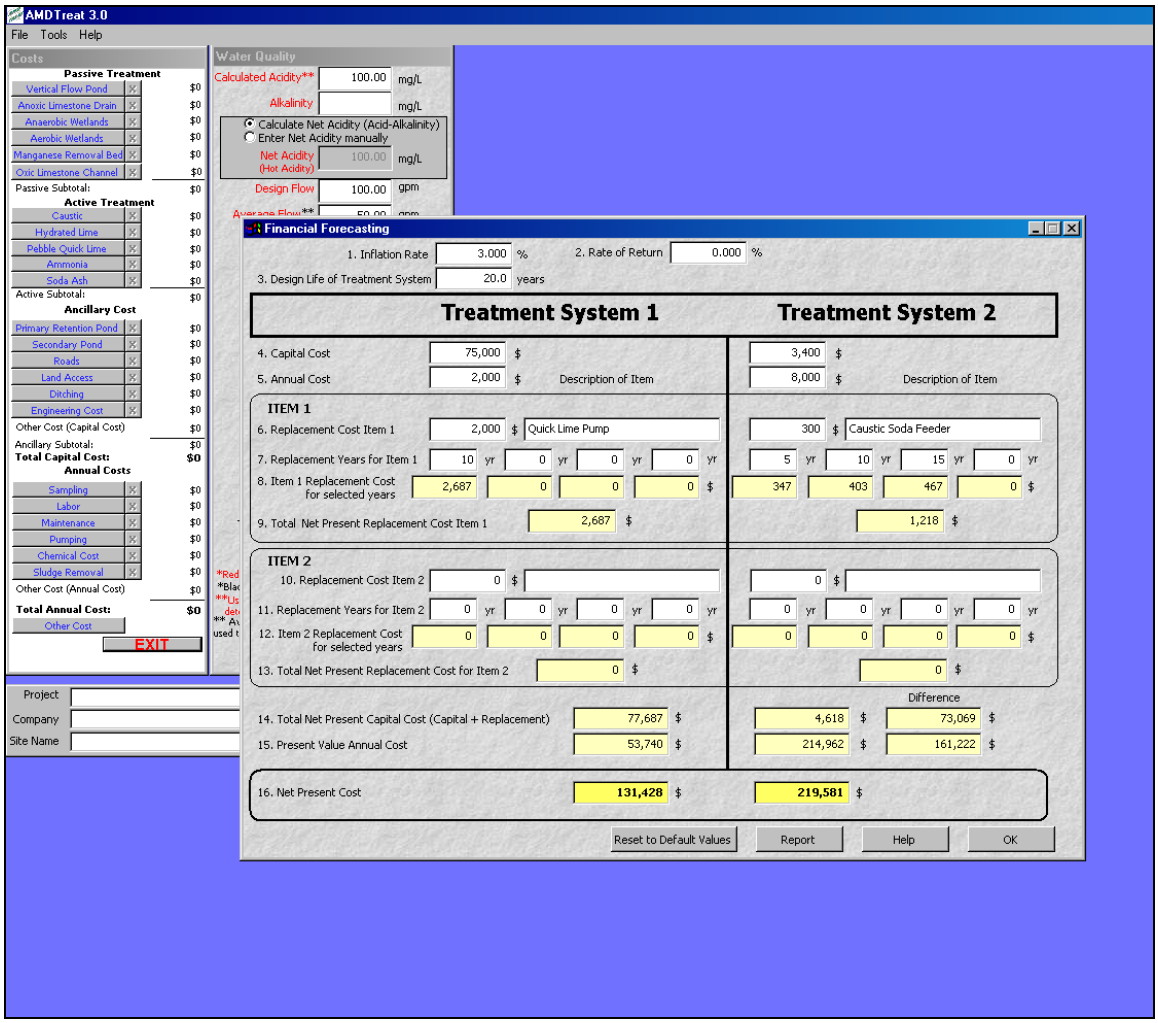
The first training class in the use of the ThermaCAM was conducted on November 24, 2003, at the WRCC Training Center in Denver. The ThermaCAM is available for checkout through TIPS for State, Tribal and OSM offices.

TIPS and the AMDTreat Team offer software solution to mine drainage cost projections :

> *"The Team consulted, cooperated, and communicated with all affected parties to insure the best possible result. This led to the development of an efficient and effective tool to improve the conservation of one of America's most precious natural resources–water."*
>
> *Secretary Norton's 4Cs Award nomination*

OSM, in cooperation with the Pennsylvania and West Virginia Departments of Environmental Protection, jointly developed a computer program called AMDTreat to estimate the capital and annual costs to abate pollutional mine discharges.

Discharges currently impact over 2500 miles of streams in Pennsylvania alone. AMDTreat uses a three-step approach to estimate treatment costs: (1) Users enter water quality and quantity data, (2) Users "model" an active and/or passive treatment system by selecting the applicable treatment components from the software menu, and (3) Users customize each treatment system to site-specific conditions by controlling the size, quantity, and unit cost of treatment components.



AMDTreat screen capture showing the financial forecasting module that allows for the evaluation of the economics of long-term water treatment.

AMDTreat provides the states, industry, watershed groups and the public with a means to consider long-term economics when choosing among various treatment options.

Largely as a result of the extensive outreach conducted during development of AMDTreat, the Development Team was awarded the Secretary of Interior's "Four C's" Award."

As an extension of the earlier outreach and development efforts, TIPS is delivering a comprehensive training program to support and facilitate the states' use of AMDTreat. Both Pennsylvania and West Virginia are currently engaged in the process of addressing extensive AMD legacies, both from pre-law and post-law sites. AMDTreat is a powerful tool being employed in this effort. The training provided by TIPS is providing the states with a much needed jump start in the use of the software.

In the first three months after the release of AMDTreat, its website (http://amdtreat.osmre.gov) recorded more than 150,000 hits and generated over 500

written requests for the software. Requests for and downloads of the software have originated from 20 states and 18 foreign countries.

Field Mapping Using Mobile GIS: During 2003, OSM staff used GPS enabled tablet computers and ArcPAD GIS software to map several thousand acres of land that were mined and left inadequately reclaimed due to the bankruptcy of a mining company in Missouri. The mapping effort was initiated to aid in estimating reclamation liability of this multiple-permit bond forfeiture area. The work clearly demonstrated the usefulness of Mobile GIS technology for mapping, data collection and reclamation cost analysis. Additional efforts were underway during 2004 in Alabama and Illinois to improve the quality and accuracy of water and soil data collection. During 2003 and 2004, OSM conducted a series of workshops, assistance efforts and hands-on training sessions with state regulatory and AML programs to help introduce them to Mobile GIS and Mobile computer assisted drafting (CAD) technologies for their program operations. During 2005, TIPS OSM and state participants in the Mobile Computing effort will work with other SMCRA programs to further perfect the technology and integrate it in SMCRA operations.

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 2005.

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. TIPS GIS tools produce 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 a National information database OSM maintains to support many types of research and program efforts, but primarily it supports 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 continue throughout 2005.

Ownership and Control Rule: Settlement negotiations with the National Mining Association concerning their judicial challenge of certain aspects of the 2000 Ownership and Control rule concluded and a proposed rule reflecting the settlement was published in 2003. A final rule is expected to be published in 2004. In 2005, OSM will provide assistance to States anticipating implementation of the revised rules in the form of training, technical assistance, program review and strategic development.

E-government Initiatives: During 2004, OSM will continue to redesign the AVS software. The redesign will incorporate improved user-friendly technologies and feature a web-based platform. The last upgrade of the AVS software occurred in 1994. Once completed, the current redesign will incorporate many technological advances since 1994 and trigger delivery of operation training and technical assistance to our State partners, as well as to OSM and other Federal users. As we have in the past, OSM will continue to provide the software free-of-charge to the industry and general public.

AVS Website: The AVS website (www.avs.osmre.gov) provides general information about the system, including how to 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 $2.9 million for Technical Training, $2.3 million of the funds support OSM's Environmental Protection activities and $0.6 million support Environmental Restoration activities. Training provided ensures OSM, State, and Tribal staff posses the necessary knowledge and skills to implement the Surface Mining program. This activity supports the Department's Resource Use and Resource Protection goals.

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. This joint effort exemplifies Secretary Norton's 4C's of cooperating, communicating, and consulting with local agencies to foster good conservation practices. In FY 2003, 85 percent of students were from States and Tribes; 13 percent from OSM; and 2 percent 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.

National Technical Training Program (NTTP)
FY 2003 Planned Program Performance: Train 900 students; customer effectiveness rate in the quality of technical training – 90%.

In 2003, the NTTP Manager estimated the funding needed to achieve the planned program performance. The bulk of costs for training students are travel and per diem. Using financial data and data from the course needs assessment, the manager was able to determine the amount of funding needed to achieve the planned performance goal of training 900 students.

As a result, in FY 2003, the Technical Training Program provided 52 sessions of 33 courses to a total of 974 participants at 29 locations in 15 different States. Fifty percent of the instructors were from 15 OSM offices, 40 percent from 13 States, 5 percent from Solicitor's offices, and 5 percent from other sources. The program trained 974 students, exceeding its goal of 900 students, and had a 96 percent customer satisfaction rating, exceeding its target of 90 percent by 6 percent.

In FY 2003, a new course, SMCRA and the Endangered Species Act, was offered for the first time. The course facilitates 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. Another new FY 2003 course offering is 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 from ground vibrations, air blasts, fumes, and flyrock. Another recently developed course, Acid-Forming Materials AML Workshop, was designed to assist AML students in the Midwest in reclaiming problematic areas. This course currently is being adapted for use by Eastern AML experts.

Also piloted in FY 2003, is the Passive Treatment Systems for Acid-Mine Drainage course. 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. In line with the President's e-government initiative and in conjunction with the States, OSM 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. Two modules were completed in FY 2003 and we expect the remaining modules to be completed in FY 2004. Some costs savings from reduced travel are anticipated.

Also in FY 2003, in support of the e-Government initiative component of the Administration Management Plan, the training program, in partnership with the U.S. Fish and Wildlife, made solid progress in making GPRA follow-up evaluations, course registration, and other administrative processes available through the Internet. We expect these processes will be available in 2004.

In conjunction with the States, OSM evaluated proposals for several new hydrology courses including one on quantitative hydrogeology and one on forensic investigation of hydrologic problems. The Quantitative Hydrogeology: Theory and Application course will be developed to provide students with an introduction to using quantitative methods to describe ground water flow and transport. Students will learn to apply the methods to conduct impact analyzes, 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. Work on the Forensic Hydrology Investigations course will be completed in 2004. In FY 2004 we will develop a refresher Instructor Training Course for our more than 200 instructors based on their request to enhance their presentation delivery skills. The course will be piloted in 2005. In 2004, we will also be assessing development of two new courses for AML staff—one on site investigations and the second, a workshop on drilling and grouting techniques.

Modeling on the success of the 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. OSM anticipates that additional workshops will be held in, possibly in late 2004 or early 2005. Topics for benchmarking sessions are determined by State and OSM participants. Initial interest has been shown in topics such as subsidence control; bonding calculation and methodologies; contemporaneous reclamation; reclamation technology and techniques for active and abandoned mines; water quality jurisdictional issues, and effective outreach and response to citizens under the Surface Mining Control and Reclamation Act (SMCRA).

In FY 2004 and 2005, OSM intends to continue to provide training to approximately 900 students. The program increased its customer effectiveness rating goal for FY 2004 to 92%, and increased the goal to 93% for FY 2005.

b. TIPS Software Application Training

TIPS established a software training program focused on use of TIPS provided software in Title IV and V applications, including permitting analysis, and AML reclamation design, construction and monitoring. TIPS software training is a cooperative State and Federal effort – In FY 2004, 16 of the 48 current TIPS instructors are from State programs.

In FY 2003, 446 technical professionals from the States, Tribes, OSM, and industry were trained in 88 classes under the TIPS computer applications training program. Thirty-six of these classes were held at OSM's regional computer training facilities. Ten classes

were conducted at customer sites. The table below shows the various categories of 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. Forty-four 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 2003

COURSES
AMDTreat (AMD cost estimation)
ArcGIS (Geographic Information System)
TerraSync Global Positioning Systems (GPS)
ArcPAD (GIS mobile computing)
ArcView (GIS)
Computer-Aided Design (CAD) Applications
Statgraphics (Statistics software)
Groundwater Vistas (ground water model)
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 2004 and FY 2005, the TIPS training program plans on scheduling at least 30 classes to be held at regional training centers each year, with additional customer site classes conducted where appropriate. Also, additional e-Training courses will be offered in GIS, CAD and slope stability software.

In FY 2003, the TIPS training program exceeded its target customer satisfaction rate of 88 percent by 3 percent, with an average satisfaction score of 91 percent. In FY 2004 and FY 2005, OSM intends to meet its 89 percent customer satisfaction goal, and to provide training for approximately 500 students annually. Also, 60 more students will be trained in Mobile Computing in FY 2005.

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 2004 and FY 2005, 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.

Revised Universal Soil Loss Equation Learning Modules: For the third consecutive year OSM's Western Region distributed CDs with 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 upgraded software now operating in WINDOWS 2000 and XP environments. The guidelines are providing guidance 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, OSM has modified the above RUSLE Guidelines to complement the new U.S. Department of Agriculture's RUSLE 1.06c software. In addition, two e-learning modules on the RUSLE model have been added to the RUSLE CD and to the RUSLE information on the web site. Each module consists of a set of PowerPoint slides and a live narrative by the author, walking the user though the slides, the first set being information on creation of the RUSLE model for mined lands, construction sites, and reclaimed lands, and the second one on the use and misuse of RUSLE.

Western Regional Workshops: In FY 2004, OSM sponsored four regional information workshops for new technologies implementation, at the Western primacy States request. All states regulatory agencies are attempting to develop processes for records conversion and document management within the framework of existing budgets, staffing resources, and prioritized needs. Most states welcome technical assistance in developing practical systems and standards for records conversion into Adobe Acrobat PDF documents and

Optical Character Recognition (OCR) technology to produce useable text from scanned documents; in addition to having a document management, and control database.

The seven western states participating in the workshops, shared the different technologies available, and mastered by their staff, making other participants aware and appreciative of what is involved in implementing these new technologies.

Permitting management and staff often need assistance in understanding and training for the transition into electronic permitting. All states agree that electronic permitting will ultimately save money, time and staff resources, but the transition requires the ability to work in both the old and the new environments. Having sufficient knowledge of the demands of new technologies, as well as having resources to get through this transition, is the key to success. The technology transfer workshops offered opportunities for developing standards for data, protocols for generating and submitting GIS information, and possibly developing application standards that would integrate GIS information into the daily workflow process and provide these same data over the Internet.

3. Technology Transfer

Of the $3.2 million requested, $1.6 million of the funds for technical transfer support OSM's regulatory program activities and $1.6 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 activity supports the DOI Resource Protection and Resource 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, however, in FY 2005 it proposes to support applied Science projects that address our major environmental issues. Currently, 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.

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 coordinate activities with primacy States, tribes and industry and 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.

A few examples of electronic permitting achievements include:

- *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.

- *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.

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. OSM partners with the States to develop technology transfer priorities. The OSM national and regional technology transfer teams evaluate initiatives to encourage networking and information sharing that will result in program improvement or enhancement.

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. Additional public outreach and technology transfer occurred in FY 2003 and 2004 following release of the draft in May 2003. OSM posted the draft EIS and the many study results on the web for public review. 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 2005.

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 though 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.

In FY 2003, the Mid-Continent Region conducted a workshop on "Reforestation of Drastically Disturbed Lands", and in FY 2004 the Appalachian Region launched an initiative that focuses on encouraging and supporting the reforestation of mined land in the mountains of Appalachia. These initiatives encourage partnerships with the states, academia, citizens groups, and industry to educate, promote, and assist in reforestation efforts.

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 2003 include: OSM initiated planning for its 4th technical interactive forum; updated and maintained its informational website, including proceedings from the workshop and other new information (http://www.mcrcc.osmre.gov/ccb/); served on a national steering committee to review proposals for CCB recycling; provided assistance to others concerning proposed EPA rulemaking on placement of CCB; and served with DOE on a steering committee developing an international coal ash symposium. In FY 2004 and 2005, OSM will continue its efforts in this important area.

Indiana Bat & Coal Mining Forum: The endangered Indiana Bat is found in more than half of the states with SMCRA regulatory programs. OSM works with the state SMCRA programs and the Fish and Wildlife Service to ensure that these valuable animals receive full protection under the Endangered Species Act with minimal disruption to the production of coal. OSM is planning to hold an interactive forum November 16-18, 2004 in Louisville, KY, the purpose of which is to ensure protection of Indiana Bats through improved SMCRA permitting procedures. There will be five sessions on: The Biology and Life History of the Indiana Bat; Field Techniques for Biological Assessment; Consultation Process; Case Studies; and Guidance Development for Permitting. OSM organized a steering committee of experts from state and federal agencies and universities to plan and carry out the forum. Proceedings will be produced.

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 2004 and 2005, OSM will continue to develop, distribute, and communicate these products. In FY 2005 proposes a national forum on Bat Habitat Conservation in Louisville, Kentucky.

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 2004 and again in FY 2005. 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.

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, 44 experimental practices have been approved; 18 were determined to be successful and 3 unsuccessful; 19 are currently underway; 1 was terminated due to regulation change, and 3 have been completed but final reports not yet received.

OSM received 6 new experimental practices from, Virginia, West Virginia, and Kentucky in FY 2003. It is likely that the interest in experimental practices will continue at the same level in FY 2004 and FY 2005.

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 2004 and 2005.

FY 2003 PROGRAM PERFORMANCE ACCOMPLISHMENTS

In 2003, the major accomplishments in the Technology Development and Transfer program activity include:

- The Small Operators Assistance program helped 56 small coal mine operators collect technical data needed for mine permit applications.
- National Technical Training Program (NTTP) offered 52 sessions of 33 different courses. In addition to regularly scheduled courses, NTTP held special sessions of the Subsidence course, the Blasting and Inspection course and the Excess Spoil Handling and Disposal course for West Virginia students; a special session of the Principles of Inspection course for Alaska; and a special session of the Advanced Blasting course for Kentucky.
- The Technical Innovation and Professional Services conducted 88 classes for 446 students.
- Technical library staff responded to more than 335 requests from state regulatory staff, other federal agency staff, citizens, coal industry, consultants, and academics.
- OSM sponsored an interactive forum for more than 200 attendees from government, industry, academia, and consultants on the use of geophysical methods for locating the extent of underground mine workings in Lexington, Kentucky.

FY 2004 PLANNED PROGRAM PERFORMANCE

- OSM will provide TIPS training for approximately 500 students.
- Technical library staff will respond to 350 publication requests from state regulatory staff, other federal agency staff, citizens, coal industry, consultants, and academics.
- 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 2004, the AVS Office will continue to redesign the AVS software.
- NTTP will continue development of its on-line training course to provide students with basic information on acid-forming materials prior to attending advance materials class.
- Meet performance goals as follows:

	FY 2003 Actual	FY 2004 Plan	FY 2004 Plan versus FY 2003 Actual
Customer satisfaction in the quality and timeliness of AVS provided services. (BG)	98%	95%	-3% (-3%)
Customer service rate in the quality of technical assistance. (BG)	100%	94%	-6% (-6%)
Percent satisfaction with scientific and technical products and assistance. (BG)	93%	92%	-1% (-1%)
Customer effectiveness rate in the quality of technical training – NTTP. (BG)	96%	92%	-4% (-4%)
Number of students trained – NTTP. (BG)	974	900	-74 (-8%)
Customer satisfaction rate for TIPS. (BG)	91%	89%	-2% (-2%)
Accomplishment Data: Technical training measures are based on customer surveys and course attendance records. Measures of general technical assistance, technology transfer, and AVS success are also based on customer surveys.			

JUSTIFICATION OF 2005 PROGRAM CHANGES

Technology Development and Transfer	FY 2005 Budget Request	Program Changes (+/-)
$(000)	18,029	1,100
FTE	125	0

National Technical Training Program (+$400,000) - OSM's National Technical Training program works to ensure that the succession planning goals of State, OSM, and Tribal surface mining agencies are met so that new staff are trained or cross-trained prior to the departure of existing staff. With additional funding in 2005, the program will develop several critical new classes to meet changes in available technology and in the changing workforce. These new classes will make available to students the latest advances in reclamation technology to effectively implement SMCRA. This includes a refresher course for more than 200 NTTP and TIPS instructors to incorporate advances in instructional technology. It also includes development of new hydrology courses that will address the theoretetical principles and field methods critical to accurately using and interpreting hydrologic models. To meet the needs of new AML project managers, NTTP will re-vamp the five workshops that address AML problems including dangerous openings, dangerous highwalls, underground mine fires, landslides, and subsidence. In addition, work will begin on developing two new courses—one on AML site investigations and the second, an advanced workshop on drilling and grouting techniques.

Technical Innovation and Professional Services (TIPS) (+$400,000) - TIPS established a software training program focused on use of TIPS provided software in Title IV and V applications, including permitting analysis, and AML reclamation design, construction and monitoring. This funding will help expand the program in three areas—mobile computing, training, and remote sensing. For mobile computing, 30 ruggedized notebook computers and mobile GIS/GPS units with CAD and GIS mapping abilities will be purchased. They will be distributed to OSM, state, and tribal authorities that have the most immediate need for the field technology. TIPS training courses are much needed and in the past we have only been able to meet at a maximum 45 percent of the requests. To help meet the demand for training, TIPS has begun to develop web-based versions of its classroom courses. Funds will be used to expand this program area. In the area of remote sensing, TIPS has recently completed prototyping of the thermal imaging technology, demonstrating its applicability to mapping acid-mine drainage and areas of burning coal both in stockpiles and outcrop. TIPS will procure additional thermal imaging cameras with the funds being made available.

Applied Sciences (+$300,000) - OSM is proposing to advance reclamation technology by supporting initiatives and applied science projects and technical studies that would lead to more efficient and effective environmental practices. Applied science and technology development in the areas of reforestation, underground mine-pools, Acid Mine Drainage prevention, coal waste impoundments, valley fills, use of coal combustion by-products (CCB's), etc. are needed to ensure quality reclamation and compliance in the coalfields of the United States. Issues surrounding mountaintop mining, stream loss from longwall mining, underground mine pools and impoundments have occurred in the past few years that require resolution through science and technology. Supporting this effort is necessary to improve the efficiency and effectiveness of our state regulatory programs in how they deal with issues that are in need of new and more current science and technology applications.

FY 2005 TECHNOLOGY DEVELOPMENT AND TRANSFER PERFORMANCE

Resource Protection End Outcome Goal 1.1: Improve Health of Watersheds, Landscapes, and Marine Resources							
End Outcome Measures:	**FY 2002 Actual**	**FY 2003 Actual**	**FY 2004 Plan**	**FY 2004 Revised Final Plan**	**FY 2005 Plan**	**Change in Perfor-mance 2004 to Planned 2005**	**Long-term Target (2008)**
Number of land acres reclaimed or mitigated from the effects of degradation from past mining. (Calculated equivalent acres) **(SP)**	8,606	6,539	6,900	6,900	8,200	1,300 +19%	8,200
Number of stream-miles for which degradation from past surface coal mining has been improved **(SP)**	UNK	UNK	150	150	175	25 +17%	175
Number of surface acres of water for which degradation from coal mining has been improved. **(SP)**	UNK	UNK	150	150	175	25 +17%	175
Resource Use End Outcome Goal 2.1: Manage or influence resource use, and ensure optimal value.							
Percent of active sites that are free of off-site impacts. **(SP)**	92.8%	92.8%*	94%	93%	93%	0	93%
Number of acres where reclamation goals are achieved as evidenced by release from Phase III Performance Bonds. **(SP)**	73,407	60,641*	70,000	70,000	70,000	0	70,000
Bureau and PART Measures:							
Customer satisfaction in the quality and timeliness of AVS provided services. **(BG)**	97%	98%	95%	95%	95%	0	95%
Customer service rate in the quality of technical assistance (applies to both the Resource Protection and Resource Use Goals). **(BG)**	98%	100%	94%	94%	94%	0	94%
Percent satisfaction with scientific and technical products and assistance (applies to both the Resource Protection and Resource Use Goals). **(BG)**	96%	93%	92%	92%	92%	0	92%
Customer effectiveness rate in the quality of technical training – NTTP (applies to both the Resource Protection and Resource Use Goals). **(BG)**	96%	96%	92%	92%	93%	1% +1%	93%
Number of students trained – NTTP (applies to both the Resource Protection and Resource Use Goals). **(BG)**	932	974	900	900	900	0	900
Customer satisfaction rate for TIPS training (applies to both the Resource Protection and Resource Use Goals). **(BG)**	91.5%	91%	89%	89%	89%	0	89%
*Figures are annual estimates based on 9 months of actual data. SP = DOI Strategic Plan Measure; PART = Program Assessment Rating Tool Measure; BG = Bureau Measure; UNK = data is unavailable.							