



# **ABANDONED MINE LANDS 2004 ANNUAL REPORT FOR NORTH DAKOTA**

## **PART I. INTRODUCTION**

The North Dakota Abandoned Mine Land Reclamation (AMLR) program continues to operate under the guidelines of the Surface Mining Control and Reclamation Act (SMCRA), the approved State Reclamation Plan, the Federal Assistance Manual, and associated rules, regulations and policy decisions. The State AMLR program is administered by the Abandoned Mine Lands Division (AML D) of the Public Service Commission (PSC). The State was granted primacy in 1981 and they administer an excellent AMLR program in full compliance with their approved AMLR Plan. Oversight of the state reclamation program is conducted by the Casper Field Office (CFO) of the Office of Surface Mining (OSM), and the topics of this report were selected in concert with the State. This evaluation is based on OSM Directive AML-22 and covers the period of July 1, 2003 to June 30, 2004.

North Dakota is a minimum program state that receives only \$1.5 million dollars each year to accomplish the necessary reclamation of hazardous abandoned mines. With this limited funding, the AMLD must complete reclamation work in an efficient and cost effective manner to stretch their fiscal capabilities as far as possible. All of the project design and specification work is completed in house by staff personnel, and the actual reclamation work is contracted out to private construction firms. The minimum funding the State receives does not allow for completion of the majority of the projects in one construction season, so larger projects must be phased over a period of years to achieve adequate reclamation. Several projects are presently ready for immediate construction if additional funding were to become available. These are listed on chart #I.

The AMLD initiates reclamation activities each spring as soon as weather conditions allow. Many of the rural sites are accessible only by dirt and gravel roads, which must be allowed to dry sufficiently before heavy equipment can travel on them. Work may start as much as two months earlier on sites that are located near the paved road system, and it continues until it is halted by the severe weather conditions usually encountered in North Dakota during the winter. Some types of work, such as drilling to locate underground voids, can be continued into the winter months. However, this is generally the time of the year when future projects are designed, and other coordination necessary to get projects ready for the next construction season is completed. All of the reclamation completed in North Dakota to date has been on abandoned coal mines, and no non coal work is planned. The State estimates that it will take at least ten to fifteen years to reclaim the coal problems now listed on their inventory with the present minimum program funding level.

The CFO continues to enjoy an excellent working relationship with the staff of the North Dakota AMLD. Their personnel are experienced, knowledgeable and dedicated to the goals of the program. The AMLD also maintains a good relationship with the other State and Federal agencies that must be contacted during the course of preparing projects for reclamation.

One AMLR grant was awarded to the State during this evaluation period and it became active on March 1, 2004. The grant was approved well within the government performance period requirement of 60 days. No problems or issues exist in the North Dakota AMLR program.

The following is a list of acronyms used in this report:

SMCRA	Surface Mining Control and Reclamation Act
AMLIS	Abandoned Mine Land Inventory System

AMLR	Abandoned Mine Land Reclamation
AMLD	Abandoned Mine Land Division
PSC	Public Service Commission
OSM	Office of Surface Mining
CFO	Casper Field Office
AML	Abandoned Mine Land

## **PART II. NOTEWORTHY ACCOMPLISHMENTS**

The AMLD staff continues to be a major contributor of technical presentations at the annual conferences of the National Association of Abandoned Mine Land Programs, and new and innovative reclamation techniques are provided for the benefit of the entire association in most issues of the association newsletter. Staff personnel also gave a technical presentation at the Fifth Biennial Workshop of the Interstate Technical Group on Abandoned Underground Mines during this evaluation period. The expertise of the AMLD staff is well recognized throughout the abandoned mine reclamation community, and they readily share this expertise with other programs.

## **PART III. ON SITE EVALUATION OF PROJECTS**

During this evaluation period visitations were made to seven completed projects and two projects that were under construction. One of the completed projects visited was an emergency project, and the Buechler/Garrison project was visited twice. It is difficult, if not impossible, to recognize reclaimed abandoned mines in North Dakota that have gone through two or more seasons of vegetation growth from the surrounding terrain. The great majority of the AMLR sites have a vast amount of good quality topsoil on them so revegetation is usually not a problem, and each site is left as near to the original contour as possible. The following is a brief description of the sites visited during this evaluation period:

The Buechler/Garrison AML project was a drill and grout project designed to fill voids under and adjacent to a State Highway just outside of Sawyer, North Dakota. This is a heavily undermined area and several previous projects have been reclaimed in this area. Subsidence had occurred in the borrow ditch and in the roadway itself posing a hazard to users of the area. Drilling adjacent to the roadway was being done vertically, and every 20 feet a slant drill hole was bored under the surface of the road. When voids were discovered they were grouted with a cement mixture to stabilize the surface. The grout is pumped in under pressure so that the mixture will penetrate the rubble caused by the subsidence and add an additional measure of support to the surface. One of the voids under the road took 215 concrete truck loads of grout before it was filled. Each truck load represents eight cubic yards of material, so the voids the local citizens were driving over on a daily basis were certainly large enough to cause a major problem if subsidence occurred. Exploratory drilling and geophysical investigations were also conducted within residential areas in the town of Garrison. A project to fill mine voids at these sites will be conducted in 2005.

The Custer Mine site is one example of a large project that was completed in phases. This 640 acre site was completed in three phases over a three year period. The first phase eliminated a highwall that was immediately adjacent to a paved major highway. Parts of this highwall were actually encroaching into the paved area and posed a very dangerous hazard to anyone driving on the highway. The second and third phases eliminated highwalls that were further from roadways, removed some toxic spoil piles and enhanced the area for wildlife. Several bodies of water were retained in the reclamation process and they are now well stocked fisheries as well as excellent waterfowl habitat. The area is managed by the North Dakota Fish and Game Department and is a popular area for fishermen, hunters and other recreationists.



**Custer reclamation project during reclamation in 1997.**



**Custer reclamation project after reclamation in 2004.**



The Bowbells Mine was a small abandoned surface mine that was reclaimed in 1995. It consisted of a dangerous highwall, an open pit and spoil piles. The highwall has been reclaimed to a safe slope and the old pit is now a wetland that is heavily utilized by waterfowl during the wet season and a grazing pasture for cattle when it is dry. The uniform slope of the reclaimed highwall is the only clue that a mine once operated on this property.



**Bowbells project before reclamation in 1995.**



**Bowbells project after reclamation in 2004.**

The Columbus Mine project was in its fifth phase of reclamation when we visited the site. This is a large surface and underground abandoned mine that consists of several open pits, highwalls and large amounts of spoil. Some of

the nontoxic spoil was left in place to provide wildlife habitat, and several ponds of water remain on the site for waterfowl, wildlife, recreation and livestock use. Spoil that has tested positive for contaminants is buried in a secure manner to prevent pollution of the surface or underground water systems. Tremendous amounts of dirt have been moved in the leveling of this site to bring it back to approximate the original contour in some areas. Vegetation on the parts of the site that were reclaimed during the late 1990's is excellent and these areas are now providing good habitat for wildlife and waterfowl.

Just a few miles from the Columbus Mine is the Noonan Reclamation project. It is similar to the Columbus site in that it is a large project, a lot of the water on site was retained, only the most hazardous spoil piles were reclaimed, and the nontoxic spoil piles were left in place to provide wildlife habitat. The site is managed by the Game and Fish Department and is heavily utilized during the hunting season. Some of the water bodies are in excess of 50 feet deep and can retain fish populations through the long winter months providing a good public recreational fishery. The more shallow and weed lined ponds support a large population of waterfowl, and other wildlife species are abundant on the site. Even though the topsoil was not saved during the mining operation and was mixed with subsoil during the reclamation, the vegetation growth in most of the area is excellent.

The Tioga Project consisted of two small abandoned underground mines that caused a number of very dangerous subsidence holes and one partially collapsed mine opening on facing hillsides adjacent to a ranch house. The area of these mines was used for livestock pasture and posed a definite hazard to the ranch family. Livestock was lost in some of the subsidence holes, and the number of holes that had appeared finally caused the pasture to become too dangerous to be used. The holes were excavated to the old mine workings, filled, and compacted, as was the mine opening. The vegetation was in the first growing season during our visit to the site and was adequately covering the disturbed areas to prevent erosion.

The Washburn Emergency Project was completed in May of 2000 and was visited to ensure that no signs of coal fires remain, and to see how the revegetation of the site has progressed. There were concerns that the fire in the coal spoil that was ignited by a grass fire may have moved into underground coal. Cattle are utilizing the site and the vegetative cover of the site is very good. No signs of any underground fire were noted and the coal fines that were on the surface have been buried to remove future fire hazards.

Three completed projects in the Wilton, North Dakota area were visited. These were Wilton B, Wilton C-1 and the Wilton Subsidence Project. The Wilton B and Wilton C-1 were small surface mines that were completed in 1991 and 1984, and both were in excellent condition. One of the old pits was impounded and provided good water for livestock and wildlife. Woody plants have taken a good hold on the sites as well as the native grasses, and some of the trees were in excess of 20 feet high. If a person did not know where the sites were, it would be virtually impossible to tell that abandoned mines had been reclaimed on these sites. The Wilton Subsidence Project was a large subsidence that appeared in a rancher's back yard, with several more openings appearing in a shelter belt of live trees on two sides of the residential area. The subsidence area in the yard had settled a few more feet and had been filled by the landowner and reseeded. We met with the landowner to see if he had information on other subsidence events and to check areas where previous events had taken place. No new openings were found, but the area will continue to be monitored by the AMLD.





**Wilton subsidence project before reclamation in 1999.**



**Wilton subsidence project after reclamation and maintenance in 2004.**

#### **PART IV. FISCAL AND ADMINISTRATIVE CONTROLS**

The CFO conducted financial oversight during this evaluation period and reviewed drawdowns, timeliness of grant applications and reports, program income, travel, accounting, audits, bidding procedures and property inventories. The drawdown analysis was conducted for the existing AML grant, and nine of the eighteen draws of funds were reviewed. The correct amount was drawn each time and all AMLD drawdowns followed appropriate expenditures on AML reclamation projects. Required grant reports are being submitted in a timely manner and all program income earned under the grant is being reported correctly and applied back to the grant. Under current A-133 guidelines the North Dakota AML program does not meet the dollar criteria to qualify for a standard audit. The North Dakota State auditors recently performed a risk analysis as required by A-133 and an audit was not deemed to be necessary.

Travel policies and procedures were reviewed and travel vouchers were sampled to ensure that the AMLD is following State rules. The travel records of three of the four AMLD personnel were reviewed for the past year to determine if travel and financial reimbursement were properly authorized and completed. In addition, the salary and benefits from both existing grants were examined to see that only individuals conducting Title IV work were being paid from AML grant funds. No discrepancies were noted in any of the above reviews. Nine AML projects were investigated to see if bidding procedures in competition for construction contracts followed existing guidelines. In all cases the lowest bidder was selected and the correct procedures were followed. The AMLD continues to report and transfer property correctly in each grant. A property inventory was conducted in early 2004, meeting the common rule requirements.

#### **PART V. COAL OUTCROP FIRE PROGRAM**

The AMLD conducted its first coal outcrop fire suppression project during the winter of 2003. The objective was to extinguish coal seam outcrop fires actively burning on U.S. Forest Service lands in the southwestern part of North Dakota. An estimated 30 outcrop fires have been discovered that were ignited as a result of a 1999 grass fire that burned approximately 70,000 acres of valuable grassland, fences, power poles, ranch buildings and one home in only 14 hours in a large grassland area near the Montana border. A primary concern is the possibility of additional grass fires being ignited as the overburden above the smoldering coal fires begins the natural progression of cracking and collapsing. This allows oxygen to get to the smoldering coal and causes flames that may breach the surface. Since the 1999 fire, at least four subsequent grass fires have been attributed to the burning coal seams. Underground lignite coal fires have been documented to burn for decades in North Dakota if left unattended.

Because of limited funding, suppression activities were conducted on only eight of the highest priority fires. Seven of the sites were completely excavated, mixed with wet, inert overburden material, and enclosed in a burial trench away from the coal source. One site was too large to be completely excavated and it was trenched to isolate it from any combustible material and allowed to burn itself out. Because of the size and isolation of the National Grasslands area, over one million acres, it is expected that additional fires will continue to be discovered. The federal lands are also interspersed with private ownership property. The work was completed in less than one month, and subsequent site inspections indicate that all burning materials have been successfully extinguished. The AMLD intends to submit another outcrop fire grant to continue the work in 2004/2005 as an additional \$27,000 has been made available to the State. Several photos of the fire suppression work are attached at the end of this report.



## **PART VI. PUBLIC AND INTERAGENCY PARTICIPATION**

The AMLD goes to great lengths to develop and maintain a good relationship with all the State and Federal agencies that it must work with in the reclamation of abandoned mine lands. This includes the close coordination with local agencies and groups, and the landowners who have AML sites on their land. When a project must be completed in phases, the necessary clearances and permits are obtained for the entire project during the initial phase. Planning for the complete construction portion of the project is also completed at this time. This saves a lot of staff time for the AMLD and the other agencies involved, and the private landowner can be given a schedule of when his property will be in use by the reclamation contractor. Habitat enhancement for wildlife and waterfowl is incorporated into each project where it is feasible, and the retention of surface water on reclaimed property is a high priority. The AMLD has worked closely with the North Dakota Game and Fish Department and Ducks Unlimited in the design of reclamation projects, impoundments, and in establishing seed mixtures for revegetation. They have also worked closely with the State Historic Preservation Office to record a significant amount of the mining history of the State to be provided to libraries, educational facilities, and to mitigate the loss of important cultural resources during the reclamation process.

## **PART VII. AMLIS INVENTORY MAINTENANCE**

The AMLD considers inventory maintenance a high priority and it is accomplished in an excellent manner. The State has in place a system to ensure that any information entered into the AMLIS is accurate. A sample of AMLIS information was reviewed during this EY to confirm that the system is operational and accurate. The small staff of the AMLD spends the entire summer construction season in the field supervising the reclamation of abandoned mine sites, so information regarding completed sites is not compiled and entered into the AMLIS until weather conditions prohibit the continuation of outside work. However, new sites are entered into the system as soon as they are discovered, and funding status is adjusted as it occurs. When the authorization to proceed with a reclamation project is sent to the State, it includes instructions to move funding from the unfunded column to the funded column in AMLIS and send verification of this change to the CFO.

**NORTH DAKOTA  
CONSTRUCTION READY PROJECTS  
CHART # I**

<b>Project</b>	<b>Cost</b>	<b>Economic Impact *</b>	<b>Environmental Benefits</b>
Lehigh Project-Phase VII	\$400,000	Income: \$1.3 Employment: 34	Subsidence Elimination Public Safety
Beulah Project-Phase IV	\$700,000	Income: \$1.7 Employment: 56	Subsidence Elimination Public Safety
Haynes Highwall and Sinkhole Project	\$300,000	Income: \$1.0 Employment: 27	Highwall Removal Subsidence Elimination
Columbus-Phase V	\$700,000	Income: \$1.7 Employment: 56	Highwall Removal Public Safety
Maintenance Project	\$100,000	Income: \$0.6 Employment: 14	Reclamation Preparation Subsidence Elimination
Wilton Project	\$381,600	Income: \$1.2 Employment: 33	Subsidence Elimination Public Safety
Williston Project Phases I Through IV	\$2,000,000	Income: \$4.7 Employment: 150	Subsidence Elimination Public Safety
Garrison Project	\$250,000	Income: \$1.0 Employment: 28	Subsidence Elimination Public Safety
Snake Road, Burlington Project	\$250,000	Income: \$1.0 Employment: 28	Subsidence Elimination Public Safety
Total	\$5,081,600	Income: \$14.2 Employment: 426	Restoration of Land Public Safety

\*Income expressed in millions of dollars

Employment expressed in number of persons employed as a result of the expenditure

## CHART # II, NORTH DAKOTA ACRES AND HAZARDS

Hazard <sup>1</sup>	July 1, 2003 Status <sup>2</sup>	FY 2004 Additions <sup>3</sup>	Reclaimed in FY2004 <sup>4</sup>	July 1, 2004 Status <sup>5</sup>
CS Clogged Stream	None	None	None	None
CSL Clogg. Stream Lands	None	None	None	None
DH Dangerous Highwalls	107,525 Lin. ft.	None	1200 Lin. ft.	106,325 Lin. ft.
DI Dangerous Impound.	None	None	None	None
DPE Dngr. Piles & Embk.	30 acres	None	None	30 acres
DS Dangerous Slides	None	None	None	None
GHE Gas & Haz. Expl.	None	None	None	None
UMF Undrgrnd Mine Fires	None	None	None	None
HEF Hazard Eqpt & Facil.	6	None	None	6
HWB Hazard Water Body	25	None	None	25
IRW Indust/Resid Waste	17 acres	None	None	17 acres
P Portals	10	None	None	10
PWAI Pol. Wtr. Ag & Inds	5	None	None	5
PWHC Pol. Wtr. Hu. Cons.	1	None	None	1
S Subsidence	2,000 acres	None	16 acres	2093 acres
SB Surface Burning	10 acres	None	10 acres	None
VO Vertical Opening	155	None	30	125
SA Spoil Area	110 acres	None	None	110 acres
BE Bench	None	None	None	None
PI Pits	None	None	None	None
GO Gobs	1 acre	None	None	1 acre
SL Slurry	None	None	None	None
HR Haul Roads	None	None	None	None
MO Mine Openings	None	None	None	None
SP Slump	None	None	None	None
H Highwalls	None	None	None	None
EF Eqpt & Facilities	None	None	None	None
DP Indus/Resident Waste	30 acres	None	None	30 acres
WA Water Problems	10 GPM	None	None	10 GPM

<sup>1</sup> AMLIS Keyword

<sup>2</sup> A "snapshot" of the status at the beginning of EY03

<sup>3</sup> PAD additions, by keyword, during the year

<sup>4</sup> Reclamation Accomplishments- GRPA requirement

<sup>5</sup> A "snapshot" of the status at the beginning of EY04



**CHART #III  
NORTH DAKOTA  
COMPLETED PROJECTS**

<b>Project Name</b>	<b>Project Cost</b>	<b>Economic Impacts</b>	<b>Environmental Benefits</b>
2003 Beulah/Zap Phase VII Pressure Grouting	\$276,278.80	Income: \$1.1 Employment: 26	Subsidence Prevention
2003 Buechler/Garrison Pressure Grouting	\$228,238.56	Income: \$1.0 Employment: 23	Subsidence Prevention
2003 Columbus Phase V	\$174,469.02	Income: \$.7 Employment: 11	Dangerous Highwalls
2003 Sinkhole Filling Maintenance	\$24,034	Income: \$.16 Employment: 7	Subsidence Reclamation
Noonan Planting Project	\$3,508.11	Income: \$.01 Employment:2	Tree Plantings
Custer Maintenance	\$15,780	Income: \$.02 Employment:4	Subsidence reclamation
2004 Beulah Coal fire Emergency	\$2,050	Income: \$.01 Employment: 2	Subsidence reclamation
Coal Fire Suppression Project	\$37,000	Income: \$.18 Employment:8	Coal Fire Suppression



Condensation is formed by steam venting from the coal fire at the Wambach 26A site. The coal seam at this site was 9 feet thick with only 6 feet of overburden. Wambach 26A proved to be one of the most aggressive and hottest coal fire suppression project sites completed.





Burned and charred grass at the Sather - Hanson 10 site. Most of the coal seam fires were started by a grass fire in October 1999 that burned 70,000 acres of Badlands. Looking at this picture, it is easy to see how grass fires can reignite due to the burning coal seam fires. To date, at least four grass fires have reignited in the Badlands. The source of the fires were traced back to burning coal seams.



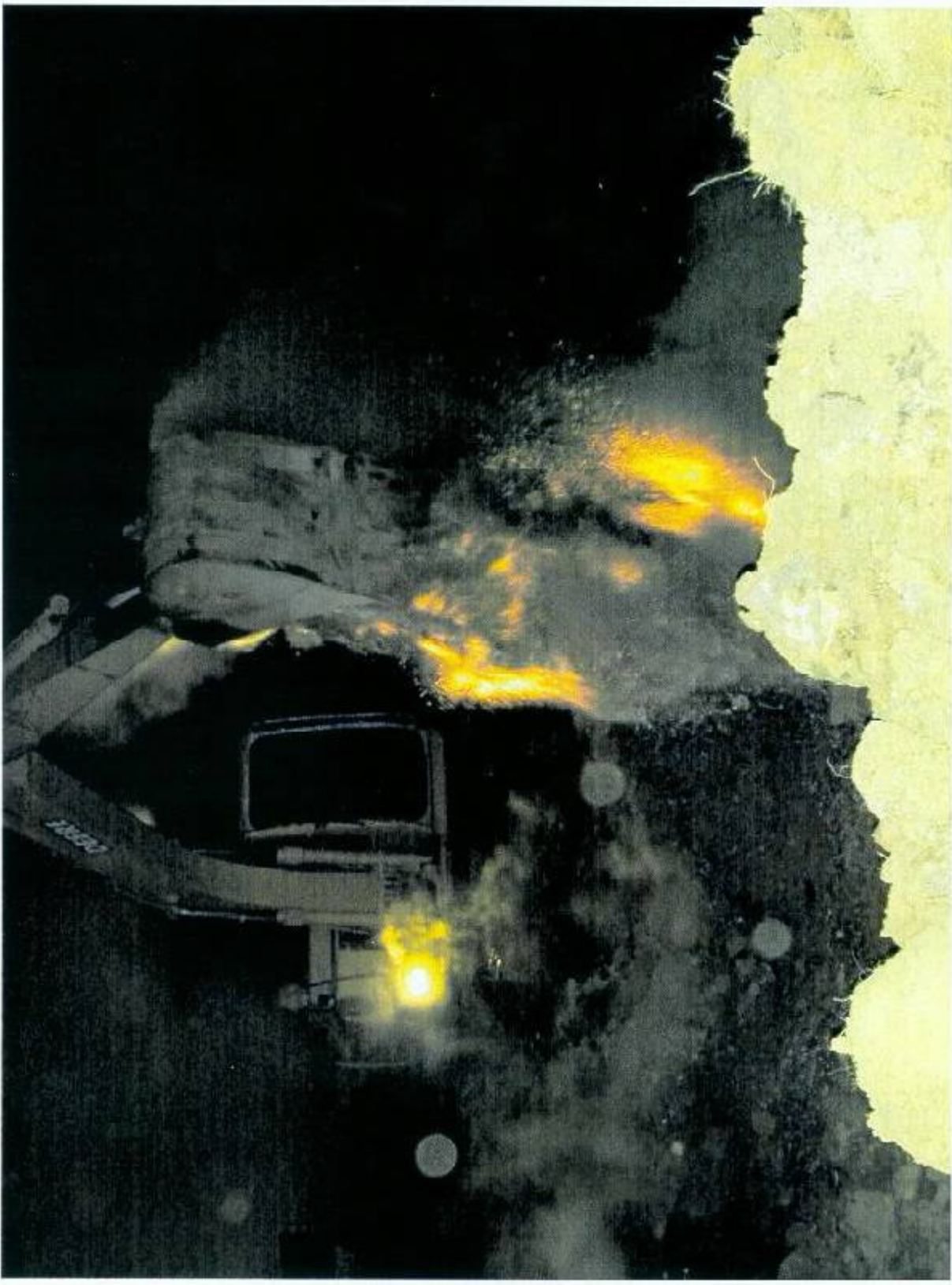


Fractured and slumping overburden at the Wambach 25 site. The coal seam at this site is 7 feet thick and the overburden is 4 feet thick. As the coal fire progresses farther into the hill, this fracturing and slumping process allows combustion gasses to escape and a new supply of oxygen to feed the burning underground coal.





The excavator digging out burning coal at Wambach 26A. The steam produced by the hot coal coming into contact with cold air made visibility a factor at some of the sites. The hot coal is excavated, mixed with non-combustible material and respread after extinguishment.



The excavator slinging hot coal at Sather- Hanson 10. Once the burning coal seam is exposed, excavation continues until all burning and hot material has been separated from the rest of the coal seam. Final inspection of the excavated coal seams were generally conducted in the morning. Backfilling commenced when all portions of the exposed coal face were cool to the touch.