

# Supplement to the 1999 Report on the Effects of Underground Coal Mining *AT A GLANCE*

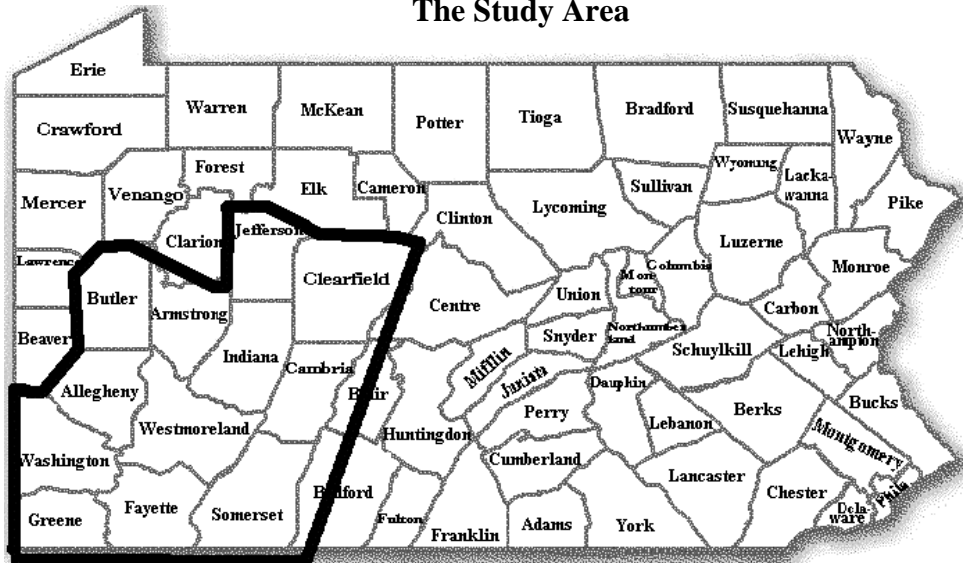
The Pennsylvania Department of Environmental Protection (DEP) has prepared a supplement to its 1999 report, *The Effects of Subsidence Resulting from Underground Bituminous Coal Mining on Surface Structures and Features and Water Resources*. The supplement was prepared to address unresolved issues from the 1999 report and comments received regarding that report.

DEP prepared the 1999 report in accordance with the Act 54 amendments to the Bituminous Mine Subsidence and Land Conservation Act, which, for the first time, provided for the replacement of water supplies affected by underground mining and the repair of certain classes of structures damaged by mine subsidence.

To complete the initial study, DEP focused data collection on 1,884 properties in a 10-county area in western Pennsylvania. The properties were identified through mine map reviews, mine operator reports, claim records and property owner survey questionnaires. Data collected for the initial report revealed that many cases had been resolved. However, there were other properties with no reports and many cases where the status of claims was unclear or in need of investigation. In order to provide a more accurate picture, DEP conducted additional investigations and surveys of property owners and mine operators.

The supplemental information reveals that subsidence damage from underground mining was reported on nearly half of the properties in the study area. Underground mining resulted in impacts on overlying land, structures and water resources. Seventy percent of these damages have been resolved. Mine operators have responded to these impacts by providing temporary and replacement water supplies, repairing land and structure damage and compensating property owners. To date, enforcement action has been limited to six orders requiring compliance with the damage repair and water supply replacement requirements of Act 54.

**The Study Area**



## Updated Findings

The information gained through additional investigations and surveys enabled DEP to compile records on more properties and to refine the scope of study population. The study population was trimmed from 1,884 properties to 1,855 properties after filtering out duplicates and reports that were not related to mining during the study period (August 1993 – August 1998). The number of properties with definitive information increased from 1,060 to 1,677. The table below summarizes and contrasts current information with that available at the time of the 1999 report.

Categories	Properties	
	1999	2000
Total properties	1884	1855
Properties with definitive information	1060 (56%)	1677 (90%)
Properties reporting damage	629	802
Damage (% of total properties)	33%	43%
Damage (% of properties with definitive information)	59%	48%
Damage cases resolved	367 (58%)	558 (70%)
Damage cases “in process”/Other status	262 (42%)	244 (30%)

At the conclusion of data collection, information had been obtained on 90 percent of properties within the revised study population. The final count of properties with associated reports of damage was 802, which represents 43 percent of the total study population or 48 percent of the properties with definitive reports. The information also revealed that 70 percent of cases had been resolved.

As shown in the accompanying table, the most frequently reported types of impacts were water supply problems. Structure damages were reported less frequently and land damage least frequently. Resolution rates ranged from 74 percent for water cases, 72 percent for structure damage cases and 62 percent for land damage cases.

Types of Reported Impacts		
<i>Water</i>		
Categories	1999	2000
Total properties	1884	1855
Properties reporting damage	533	678
Cases resolved	373 (70%)	500 (74%)
Cases “in process”/Other status	160 (30%)	178 (26%)
<i>Structures</i>		
Categories	1999	2000
Total properties	1884	1855
Properties reporting damage	280	352
Cases resolved	179 (64%)	252 (72%)
Cases “in process”/Other status	101 (36%)	100 (28%)
<i>Land</i>		
Categories	1999	2000
Total properties	1884	1855
Properties reporting damage	150	188
Cases resolved	39 (26%)	117 (62%)
Cases “in process”/Other status	111 (74%)	71 (38%)

## Longwall vs. Room-and Pillar Mining

To better clarify the effects of longwall mining versus the older room-and-pillar method, information relating to these different mining methods was put into separate categories.

Longwall mining is a high-extraction mining method where coal is removed in panels and the timing and extent of subsidence is planned and predictable. In room-and-pillar mining, coal pillars are left in the mined-out coal seam to support the roof and can often lead to unexpected subsidence after the operation ends.

The 1,855 properties within the revised study population included 932 properties that were situated above longwall mines and 923 properties that were situated above room-and-pillar mines. The information collected revealed that 324 properties in the longwall group and 551 properties in the room-and-pillar group had no reported damage. In the longwall group, 523 properties had associated reports of damage compared to 279 from the room-and-pillar group. There were also 49 properties in the longwall group that had been purchased by the mine operators and had no reports indicating the presence or absence of damage. There were also 36 longwall properties and 93 room-and-pillar properties that had no definitive reports.

<b>Account of Damage by Mine Type</b>			
<b>Category</b>	<b>Longwall</b>	<b>Room-and-Pillar</b>	<b>Total</b>
Properties with no damage	324	551	875
Properties with reported damage	523	279	802
Properties owned by operators	49	0	49
Properties with no information or no usable information	36	93	129
<b>TOTAL</b>	<b>932</b>	<b>923</b>	<b>1,855</b>

The extent of impacts varied among the 802 properties with reported damage, as shown in the table below. There were 114 properties with reports of combined impacts to water supplies, structures and land. There were also 188 cases with two types of impacts. The remainder of the cases involved one type of impact, with water supply impacts being the most prevalent. The table below shows the extent of impacts among the 802 properties with reported damages and provides a breakdown of impacts by mine type.

<b>Information Relating to Extent of Impact</b>			
<b>Extent of impacts</b>	<b>Longwall</b>	<b>Room-and-Pillar</b>	<b>Total</b>
Water, Structure and Land	104	10	114
Water and Structure	138	9	147
Structure and Land	18	2	20
Water and Land	16	5	21
Water only	167	229	396
Structure only	61	10	71
Land only	19	14	33
<b>TOTAL</b>	<b>523</b>	<b>279</b>	<b>802</b>

## Follow-up Issues

DEP followed up on all cases where mining had reportedly altered the flows of overlying streams. Through additional investigations, the list was refined to 15 streams that were confirmed to be perennial (i.e., flow year-round) prior to mining. Nine of these streams exhibited pooling conditions resulting from subsidence along their channels, and four streams exhibited diminished flow. Two streams exhibited both pooling and diminution along undermined segments. Although pooling was the most widely observed condition, DEP found that subsidence effects on aquatic resources and stream uses were largely uncertain. To determine the effects of subsidence on streams, wetlands and riparian areas, DEP is contracting with an outside consultant to complete an independent, scientific study.

Through feedback on the 1999 report, DEP found that a high-profile case involving damage to a large, privately owned water transmission line had been omitted from damage summary tabulations. In order to ensure coverage of all water system operators, DEP re-examined its list of water system operators and contacted 12 water system operators that were not previously contacted. No additional damages were found.

DEP has implemented changes to improve its data collection programs and improve the quality of future reports. DEP has revised its regulations to require mine operators to report all incidents of subsidence damage and water supply impacts to its McMurray District Mining Office. DEP has also made improvements to its databases so that it can readily identify all claims that have not been resolved and the length of time those cases have gone unresolved. In addition, DEP is contracting with independent consultants to perform three separate studies on the effects of subsidence on streams, wetlands and riparian areas; forestland; and property values.

For a printed copy of the Supplement or the 1999 report, contact Harold Miller at 717-783-8845, e-mail [Miller.Harold@dep.state.pa.us](mailto:Miller.Harold@dep.state.pa.us), or write to Department of Environmental Protection, Bureau of Mining and Reclamation, P.O. Box 8461, Harrisburg, PA 17105-8461.

This fact sheet and related environmental information are available electronically via Internet. For more information, visit us through the Pennsylvania homepage at <http://www.state.pa.us> or visit DEP directly at <http://www.dep.state.pa.us> (choose directLINK "Act 54").



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