

**Comments on the Department of Environmental Protection's  
5<sup>th</sup> Act 54 Report (2013-2018) on the Impacts of Underground  
Bituminous Coal Mining**

**Prepared for: The Pennsylvania General Assembly, the Governor, and the  
Secretary of the Department of Environmental Protection**

**Prepared by: The Citizens Advisory Council to the Pennsylvania  
Department of Environmental Protection**

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## Introduction

These comments generally address issues and recommendations following the format of the Citizens Advisory Council's 21 July 2015 final Comments on the 4<sup>th</sup> Act 54 Report (2008-2013). Updated information is provided where available. Like previous responses to the Department of Environmental Protection's prior Act 54 Reports, a volunteer Act 54 Work Group of Council members drafted these comments for the full Council following the receipt of public comments to the Council regarding the Department's Report for the 2013-2018 (5<sup>th</sup>) Act 54 reporting period. The purpose of these Comments is to summarize current information from the Department's Report of ongoing impacts from underground bituminous coal mining in Pennsylvania in the light of public comments provided to the Council and to provide recommendations. Some of the additional information requested by the Council subsequent to publication of the 5<sup>th</sup> Report was provided to the Work Group by the Department (**Appendix A**). These Comments take particular note of responses to prior Council recommendations and provide updated recommendations together with their technical justification (**Appendix B**). The remaining three appendices provide additional documentation not available elsewhere. The citation and attachment of all appendices is not an endorsement of their content; they are used for informational purposes only.

The two most recent Act 54 reports are available in full on the Department's web page (<https://www.dep.pa.gov/PublicParticipation/CitizensAdvisoryCouncil/Issue-Areas/Pages/Act54.aspx>). Such reports are mandated by Act 54 of 1994, which amended Pennsylvania's Bituminous Mine Subsidence and Land Conservation Act (BMSLCA). That 1966 law had been enacted because unpredictable subsidence damage to surface structures and water supplies by abandoned and by unregulated active room-and-pillar mines was a widespread problem in southwestern Pennsylvania. The BMSLCA prohibited mine subsidence damage to existing homes and certain other structures. Room-and-pillar mining technology subsequently improved, and subsidence damages to surface features were reduced. Then the mining industry sought changes to the BMSLCA to allow the use of more efficient, high-extraction (longwall) technology to remove Pittsburgh Seam coal faster using less labor. In 1994, Act 54 removed the BMSLCA prohibition on structural damage to allow intentional subsidence, but required prompt repair or replacement of damaged structures and water supplies by mine operators. Act 54 did not, however, authorize any environmental damage. As part of Act 54 the General Assembly required the Department to report on the resulting impacts of underground mining at 5-year intervals.

Like the 3<sup>rd</sup> and 4<sup>th</sup> Reports, the 5<sup>th</sup> (2013-2018) Report was drafted under contract to the Department by the University of Pittsburgh. Each of the Department's 5-year Reports has garnered extensive comments from coalfield residents and the environmental community, as well as from the mining industry. Each of the Reports has documented significant continuing damage, overwhelmingly by longwall mine subsidence rather than by ongoing traditional room-and-pillar underground mining, despite the Department's issuance of regulations, its technical recommendations, and changes in its mine permit program. Impact prediction and avoidance have not progressed, yet permits are routinely approved. The actual repair of subsidence damages to structures, water supplies, and environmental resources remains rare, slow, and poorly documented. Small improvements have been made in the Department's recordkeeping, but major

gaps still surround the recording and communication of data regarding mine impacts. These issues have remained the same for thirty years, and longwall mining is expected to continue for another thirty years in southwestern Pennsylvania. Glaring regulatory weaknesses have persisted for decades, while concerns of the Council and the public continue unabated. Questions from the public and from the Council remain unanswered by the Department, and most are not addressed in the 5<sup>th</sup> Report.

## **Issue 1. Water Resource Impacts**

Despite the Council's 2015 recommendation, no technical committee has been established by Executive Order of the Governor to study whether water resources impacted by underground coal mining can be restored to their pre-mining physical, chemical, and biological conditions. During the 5<sup>th</sup> Act 54 period all 183 underground-mining-damaged streams were affected by one of the 6 active longwall mines; no stream impacts were recorded at the 37 active room-and-pillar mines or 5 pillar-recovery mines. The 27.4 miles of damaged streams represented 44% of all the stream miles undermined at the 6 active longwall mines. 90% of those damaged stream segments suffered flow losses; only 10%, the more easily repaired "pools" subsided behind "gate" dams during the period. The Report is silent as to precisely when each 5<sup>th</sup> period damage had occurred and its recovery status at the end of the period. Some unspecified amount of flow augmentation was reported as made by mine operators at 92 stream segments during the period.

Like the 4<sup>th</sup> Report, the 5<sup>th</sup> is silent as to whether many previously damaged streams recovered to pre-mining conditions, and if they had been restored, how much time had elapsed before those efforts were successful. Fewer than 60% of the 126 stream segments for which industry reports claimed recovery during the 5<sup>th</sup> period were released by the Department from further monitoring during the 5<sup>th</sup> period, all many years after the damaging, subsidence-caused flow losses had occurred. At least 30 (75%) of the not-released (but operator-reported as "recovered") streams had remained damaged for more than 5 years. Fuller records were kept of efforts to mitigate pooling: the average interval between pooling damage (which affects sediments, water temperature, and biota in pools behind the dams created by subsidence) and gate dam cutting by the mine operator was 3.4 years, with the longest reported interval more than 9 years. The Department released 42 pooled streams from monitoring based on its conclusion that stream uses had recovered, with time from damage to release averaging nearly 8 years and the longest nearly 14 years. Flow loss can terminate all uses of surface streams; pooling may allow some uses to persist, but typically entails severe biological impacts on stream ecosystems.

The Council's Work Group reviewed additional information provided by the Department concerning mine consultants' Stream Recovery Evaluation (SRE) files mentioned in the 5<sup>th</sup> Report. The release status of recovered streams tallied in the 5<sup>th</sup> Report differed from that in the files provided to the Council. The acceptance rate of proposed SREs varied widely by mine. Few if any of the SREs strictly followed the Department's technical guidance (fully applicable since 2007) for documenting stream recovery, but half (49%) of the submitted SREs were released during the period. The Department's full 2005 technical-guidance-requested stream flow documentation was provided in no SRE. All SRE files are fragmentary,

and none mentions the accuracy of pre-mining damage *prediction* at any damaged site. Sparse if any information is included on site-specific measures taken by mine operators to lessen actual damage, such as the amount or timing of flow augmentation, the quality of augmentation water, or even major interventions such as liner installation that attempted to restore surface stream flow. SREs never discuss efforts to restore floodplain wetlands, even where mitigation monitoring was required by (and presumably supplied to) the Army Corps of Engineers. (See **Appendix A**. Council's Review of Stream Recovery Evaluation Reports Filed During the 5<sup>th</sup> Act 54 Report Period).

**Thus the Council renews its 2015 recommendation for a scientific study to ascertain whether water resources impacted by underground coal mining can practically be restored to pre-mining flow patterns and pre-mining chemical and biological characteristics, and how long successful restoration takes.**

## **Issue 2. Repair of Potable Water Supply and Structure Impacts**

In 2015 the Council recommended that Act 54 be amended to require that measures actually implemented to restore, replace, or repair damaged water supplies be reported to the Department by mine operators. According to the 5<sup>th</sup> Report "Repair" was the reported resolution for only 23 (5%) of combined 423 underground-mine-liable impacts to structures, land, and water supplies recorded from active mines. This same pattern had been documented during all previous Act 54 periods. 229 (99% of) mine-damaged structures were affected by longwall mines, while 191 (83% of) water supply damages during the 5<sup>th</sup> period also stemmed from active longwall mines. Unspecified "Agreements" continued to be the prime category of resolution for damages noted by the Department, with "Purchase of Property" the second most common---in neither case does the permittee divulge or the Department know whether any repair of the damaged feature was ever attempted or completed. The Department keeps no records as to whether damages on mine-purchased properties are ever repaired. Overall, actual repair of mine-liable damage by active mines to structures, water supplies, and land was the documented resolution during the 5<sup>th</sup> period in only 37 (8%) of 486 cases. For damage from longwall mines only, "repair" was the reported resolution in 27 (6%) of 450 cases. Damage from active room-and-pillar and pillar recovery mines together was reported as repaired in 10 (28%) of 36 cases.

**Council renews its 2015 recommendation that the Department create clear records for the actions taken in response to longwall mine-attributable damages, and particularly whether or not a damaged feature was ultimately repaired or replaced as envisioned by Act 54.**

## **Issue 3. 35° Rebuttable Presumption Zone**

No reassessment of the rebuttable presumption zone wherein damage can be readily associated with longwall mining has occurred since the Council's 2015 recommendation that the basis for this guideline be studied, given recent decades of experience with damages outside the zone and the increasing size of longwall mine panels. A Rebuttable Presumption Zone (RPZ) was adopted by Act 54 in 1994 as a way to

estimate the most probable area on the land surface that may be affected by longwall mining subsidence. The RPZ, which also is mentioned in the Department's 25 Pa. Code Chapter 89 underground mining regulations, is the area within which a mine operator is presumed to be liable for any contamination, diminution, or interruption to a water supply, unless it can demonstrate otherwise. The RPZ is determined by projecting a 35-degree angle from vertical extending from the outside of a coal removal panel to the land surface. Because it is measured from the mined area, the size of the RPZ on the surface will vary depending on the depth of a specific coal seam (*i.e.*, the overburden depth).

Beginning with the 2<sup>nd</sup> Act 54 Report (compiled for the Department by California University of Pennsylvania) many subsidence damages have been observed outside the 35° RPZ, not to mention beyond other zones (30° angle of draw, 200-foot wide buffer, and 1,000-foot wide buffer) also sometimes considered by the Department for documentation of features at risk. The 4<sup>th</sup> Act 54 Report found that 50% (186 of 371) mining-labile water supply damages had occurred outside the 35° RPZ, in one case at a distance equivalent to an 85° angle. The 5<sup>th</sup> Report (unlike the 4<sup>th</sup>) does not document the specific number of mine-labile water supply impacts which occurred outside the RPZ during the period, but the small-scale maps displayed in its Appendix B suggest that there were numerous such occurrences. The initial scientific basis thirty years ago for such angles was weak, the mining literature now records subsidence damage out to nearly 2,000 feet from longwall panel edges, and it remains unclear why the Bureau of Mining Programs has not seen fit to reevaluate the adequacy of such distances.

**Thus the Council renews its recommendation that the likely extent of subsidence damages be studied and appropriate revisions made in the Department's regulations and mine permit process.**

#### **Issue 4. Time Frame for Water Supply Replacement Liability**

No action has been taken on the Council's 2015 recommendation that the Act 54 2-year limit on mine operator liability to restore or replace a water supply should be replaced by findings of Department investigations of later impacts where damage has been found to increase at some time after mining ceases. The 5<sup>th</sup> Act 54 report did not address this issue. **The 2015 recommendation still is appropriate.**

#### **Issue 5. Time Frame for Water Supply Damage Compensation**

Act 54 (Section 5.1[g]) and 25 Pa. Code 89.152(a) regulations specify that a water supply is to be replaced or the landowner is to be compensated within three years of damage. During the 4<sup>th</sup> Report period public testimony to the Council claimed that resolutions were taking longer than statutorily prescribed. Thus the Council recommended in 2015 that actions be taken to produce more timely rectification of underground mine damage to water supplies.

Damage determined by the Department to be mining-labile by active mines affected a total of 191 water supplies during the 5<sup>th</sup> period. Of the 158 water supplies damaged by longwall mines, only 5 (3%) were reported as "Repaired", and those repairs took an average of 496 days. One other damaged water

supply (an agricultural spring) received a permanent replacement, but that took 1,353 days (nearly 4 years). Of the 27 water supplies damaged by room-and-pillar mines, 3 (11%) were “repaired”, and the repairs took an average of 134 days. Three others received a permanent replacement, and those took an average of 357 days. Of the 6 water supplies damaged by pillar-recovery mines, none was “repaired”, but 1 received a permanent replacement supply that took 60 days.

**The Council’s 2015 recommendation that the timeliness of water supply replacement should be investigated and any need for further measures to reduce delay and protect public health has not been addressed.<sup>1</sup> Response to the Council’s 2015 recommendation is still needed.**

### **Issue 6. Notification of Water Supply Contamination, Diminution, or Interruption**

Landowners and water users are required by Act 54 to notify the mine operator of damage to water supplies. No action has been taken on the Council’s 2015 recommendation that *also the Department* be notified as soon as the mine operator is notified, so that it can ensure that appropriate and timely action is taken. This issue is not addressed in the 5<sup>th</sup> Report. **The Council still believes that the Department should receive prompt notification of any damage to water supplies and keep accurate records of steps toward, and the timeliness of, resolutions.**

### **Issue 7. Comprehensive Review of Bituminous Underground Mining Regulations**

In 2015 the Council recommended a comprehensive review of regulations and mining methodology to ascertain the adequacy of the Department’s regulations to prevent or mitigate damage from underground mining, especially to water resources. No action was taken on this recommendation during the 5<sup>th</sup> Report period.

Over the 25-year period of Act 54 Reports, there have been 3,095 reported underground bituminous coal mine impacts to structures, water supplies, land, or streams, 82% due to longwall mining. From the 4<sup>th</sup> to the 5<sup>th</sup> period the area from which coal was mined underground decreased from 31,343 acres (54% longwall) to 28,854 acres (62% longwall). From the 4<sup>th</sup> to 5<sup>th</sup> periods new structural damages decreased from 230 to 229, new water supply damages decreased from 193 to 158, new land damages increased from 53 to 63, and new stream damages increased from 85 to 183. (The stream damage increase in part reflects more accurate reporting subsequent to the adoption of 2005 Technical Guidance Document #563-0300-001.)

<sup>1</sup> If damage to a surface landowner’s water supply is determined by the Department to be mine-liable, the operator is to provide a temporary replacement until there is a permanent resolution. The typical temporary replacement is a “water buffalo”---a tank which is installed on a landowner’s property and periodically refilled by truck. However, any testing of replacement water quality is the burden of the landowner, and residents have indicated that the Department takes no responsibility to ensure that the quality of the temporary water is adequate or healthy. Act 54 Reports do not address this matter.

Specific Council 2015 recommendations to investigate the following remain current and should be addressed by the Department and in its 6<sup>th</sup> Act 54 Report (for the 2018-2023 period):

- measures to ensure that subsidence damage is limited through the regulation of appropriate overburden rates;
- advancements in technology and modeling that better predict the likelihood of subsidence and measures to prevent such subsidence;
- trend analysis data collected by the Department to compare actual occurrences of mine subsidence damage with impact predictions;
- locational and other technical data that provides evidence of the likelihood of mine subsidence damage in certain areas of the Commonwealth;
- data assessing the impacts of mining subsidence to water quality, including the degradation of the Commonwealth's Exceptional Value (EV) and High Quality (HQ) streams to lower designations based upon the effects of mining subsidence;
- historical data that compares impacts that were predicted vs. impacts that were not predicted; and
- current modeling to aid in the prediction of stream flow loss, and impacts to wetlands and groundwater.

#### **Issue 8. Technical Guidance Document #563-300-001 (Surface Water Protection)**

In 2015 the Council recommended that the Department's 2005 technical guidance document (TGD) *Surface Water Protection---Underground Bituminous Coal Mining Operations* be uniformly enforced by the Department, with incorporation of any appropriate provisions into mandatory regulations. This has not been done but is still essential. Both the 5<sup>th</sup> Report and followup investigations by the Council in **Appendix A** (below) show that this technical guidance still is not being fully implemented.

The Council understands that this technical guidance document is under revision and currently is slated for public review during the third quarter of 2023. The Council commends the Bureau of Mining Programs for planning to include the latest versions of the Department's metrics for biological assessment in the revised TGD, but cautions that it has not yet addressed measures for comparing the results of pre-mining data (old metrics) with post-mining data (new metrics). Even if the current TGD revision schedule is met, its provisions are unlikely to be implemented until the 8<sup>th</sup> Act 54 Report period (2028-2033), if the Department elects to enforce it uniformly.

**The Council recommends that the Department insure uniform adoption of this new guidance document by the mine permit program and award revision of this document high priority. The Council further recommends that the Department fully integrate the expertise of the Division of Water Quality (DWQ) into the permit review work of the Bureau of Mining Programs and the District Mining Offices and that the DWQ promptly incorporate the credible electronic mapping now provided by mining consultants in permit applications into its "Networked Streams of Pennsylvania" database.**

## **Issue 9. Technical Guidance Document #363-0300-001 (Wetlands Replacement)**

The Council in 2015 recommended that Department's technical guidance for wetland replacement design and monitoring be updated and incorporated into mining regulations to enable the Department to evaluate subsidence impacts. No action has been taken on this recommendation. According to the 5<sup>th</sup> Act 54 Report:

The determination [of wetland acreage undermined] could not be fully accomplished due to incomplete data availability to the University. .... As a result of the incomplete and inconsistent data obtained for wetlands, the University could only report limited conclusions. [Section 10, the shortest section of the 5<sup>th</sup> Report]

The resulting wetlands information in the 5<sup>th</sup> Report is not accurate and thus virtually meaningless. There was no change from the situation described by the 4<sup>th</sup> Act 54 Report in 2014:

The analysis and reporting on underground mining effects on wetlands is still in its infancy. .... The permit applications ... do not contain sufficiently detailed wetlands inventories, if any wetland information is present at all. [p. XI-7]

Wetlands outside the floodplain of subsidence-damaged streams continue to be ignored by the Department during mine permit review and followup assessment.

**The Council recommends that the Department fully and immediately implement the 2022 technical guidance for stream encroachment and wetland assessment for all activities covered by 25 Pa. Code Chapter 102 and Chapter 105 permits statewide into the requirements for underground bituminous coal mining permits wherever there is a potential for mine damage to water resources including wetlands: TGD 310-2137-002 and -003 *Pennsylvania Function-Based Level 2 Rapid Assessment* documents that address palustrine and riverine ecosystems. Those documents are being applied when the Department reviews applications to permit proposed damages to streams and wetlands across the Commonwealth.**

## **Issue 10. Pre-mining Stream Flow Data**

In 2015 the Council expressed concern about the dewatering of six streams that the Department had deemed "irreparable." It recommended that the Department follow up on their status and also require more appropriate pre-mining inventory of all streams to enable more accurate prediction of flow losses. The 5<sup>th</sup> Report contains no information regarding those six "irreparable" streams, but does comment (p. 7-14 and 9-13) on the inadequate hydrologic sampling presented during the period to the Department concerning pre-mining flows in other stream flows that hampered documentation of use recovery.

The Department has cooperated with the United States Geological Survey (USGS) in research on the baseflow hydrology of headwater streams in southwestern Pennsylvania (Hittle & Risser. 2019. 42 pages). On 2 July 2020 Ms. Elizabeth Hittle of USGS reviewed her findings with the Council's Act 54 Work Group. The new, practical USGS methodology for characterizing pre-mining baseflow hydrology clearly would provide a major improvement in the documentation of conditions in streams threatened by water loss atop longwall mines, but the Department has not moved to recognize, much less adopt such methodology, into its technical guidance for stream protection. 153 incidents of significant stream



flow loss were recorded affecting 24.6 miles of streams (29% of the total stream miles undermined) during the 5th Report period.

**Thus the Council strongly recommends that the Department adopt the mandatory use of the USGS methodology to characterize pre-mining baseflow hydrology in all longwall permit applications as soon as possible.**

### **Issue 11. Pre-mining Wetland Identification**

In 2015 the Council recommended that the Department revise its permit application instructions to make certain that each applicant accurately identified the location and characteristics of all wetlands within longwall mine permit areas and that the Department cooperate with the US Army Corps of Engineers to incorporate appropriate measures into all permits to minimize impacts on wetlands. The Council notes that the Department currently expects applicants to identify wetlands only within floodplains where subsidence impacts to streams are predicted and continues to ignore wetlands above longwall mines outside floodplains.

The Council repeats its 2015 recommendation that as soon as possible the Department, with the assistance of the Corps, require identification of all wetlands within underground bituminous coal mining permit areas in every permit application, with adequate followup to assure that potential damage to wetlands has been minimized and, where unavoidable, effectively documented as successfully mitigated prior to bond release. There is no reason why the coal mining industry should not be held to the same standards for wetland protection as other industries and activities across the Commonwealth. Thus the Council repeats its 2015 recommendation that all wetlands on longwall mine sites be identified and impacts minimized. To the end the Bureau of Mining Programs should adopt the substance of TGD 310-2137-002 and -003 *Pennsylvania Function-Based Level 2 Rapid Assessment* documents for palustrine and riverine resources throughout the Commonwealth.

### **Issue 12. Updating Mine Permit Applications and Regulations**

In 2015 the Council recommended that the Department keep its mining regulations and permits up to date with respect to, and in line with, changes in underground coal mining technology. The 5<sup>th</sup> Act 54 Report does not review this issue, and obsolete aspects of current regulations, technical guidance, and permits have been noted above. The Council commends the Department for planning to update and reformat its Underground Bituminous Coal Mining Manual after receiving many comments on needed changes from the mining industry and from the public. The Department currently is expending many millions of dollars of federal and State funds to clean up the damages left by legacy coal mining prior to 1976. It should be no less concerned about the avoidance and prompt repair of new damages by ongoing mining.

**The Council still recommends that the Department keep its regulations, permits, and mine monitoring up to date, and that it assign priority to updating its Engineering Manual. The Council encourages not only the cleanup of legacy impacts from coal mining but also the prevention of ongoing impacts to the extent possible.**

### **Issue 13. Updating Hydrologic Information During Mine Expansion**

**In 2015 the Council recommended that the Department revise its permit procedures to require updating of basic hydrological information whenever permit areas are expanded. This recommendation still stands.** (See discussion under Issue 10 above.)

### **Issue 14. Time for Departmental Permit Review**

In 2015 the Council recommended that the Department assure that adequate review time was provided for thorough, independent analysis of information contained in permit applications. The 5<sup>th</sup> Act 54 Report does not address this issue. The Council understands that mining permit backlogs have been significantly reduced. **This recommendation still stands.**

### **Issue 15. Replace Bituminous Underground Mining Information System (BUMIS) Database**

BUMIS for many years has recorded the activities performed by Department staff responding to complaints received regarding bituminous underground coal mine damages. The detailed information submitted electronically to the Department in mining permit applications is not compatible with or incorporated into BUMIS, and BUMIS data are not compatible with the Department's own GIS data.

Act 54 requires the Department to compile, on an ongoing basis, the information contained in deep mine permit applications, in monitoring reports, in other data submitted by operators, from site inspections and enforcement actions, and from any other appropriate source in order to determine, to the extent possible, the effects of deep mining on subsidence of surface structures and features and on water resources, including sources of public and private water supplies. Such data must be analyzed by the Department, utilizing the services of professionals or institutions recognized in the field, and submitted at 5-year intervals to the Governor, to the General Assembly, and to this Council. Four informative, if incomplete, 5-year reports have been generated to date, beginning with the 2<sup>nd</sup> report period (1998-2003).

The comprehensive information necessary for analysis and presentation in 5-year reports mandated by Act 54, however, is not contained in or retrievable from BUMIS, even if its archaic software were updated. Thus the Department has repeatedly paid contractors hundreds of thousands of dollars to create new GIS databases to help extract essential data directly from mining permit files and other sources in order to evaluate impacts and link those data with some of the information in BUMIS following the close of each 5-year period.

The Department advised the Council during its 21 April 2020 meeting that it was experimenting with making some BUMIS information more frequently available via its web page in hopes of substituting such updates for future 5-year reports. To date the raw BUMIS information primarily in Excel spreadsheet format on the Act 54 web page is contradictory, is not explained or interpreted, is not understandable by the general public, and is altogether incapable of substituting for a 5-year report. As it had previously, the Council in 2015 recommended that the Department seek resources necessary to fulfill its obligations under Act 54 and other statutes relevant to underground bituminous coal mining.

The Council once again recommends that the Bureau of Mining Programs draw upon the expertise of the Department's Office of Administration, Office of Information Technology, and Office of Geospatial Technologies Operations for data management technology and GIS support. The Council strongly recommends that the Department seek funding from the United States Office of Surface Mining and Reclamation Enforcement (OSMRE) to supplement or replace its BUMIS database with a system compatible with other Department Geographical Information System (GIS) software and transfer the appropriate BUMIS data for purposes of historical analysis. An appropriate goal would be development of a system such as that available from Fracktracker.org for Pennsylvania oil and gas data. Electronic maps from permit applicants already are compatible with the Department's GIS software and programs such as its "Networked Streams of Pennsylvania," but the Department does not make them available. Meanwhile, the Department should abandon its practice of initiating work on 5-year reports only following the close of each reporting period. The resulting delay is unnecessary and avoidable, inasmuch as work can proceed prior to the end of the report period. In addition, the Department should reframe the scope of work for its 6<sup>th</sup> Act 54 Report to more adequately and clearly analyze trends and policies for the benefit of legislators, administrators, and the general public.

#### **Issue 16. Mining Permit Fees**

The Council in 2015 recommended that the Department assess the need for additional staff within its District Mining Offices and adjust its permit fees accordingly. **To this standing recommendation the Council repeats that the District Mining Offices should fully utilize the services of staff from the Department's Division of Water Resources and the Pennsylvania Fish and Boat Commission, as well as the US Army Corps of Engineers, to maximize protection of coalfield aquatic resources.**

#### **Issue 17. Data Reporting**

In 2015 the Council recommended that the Department cooperatively identify and define specific datasets and reporting formats for permit application and other data to most efficiently enable analysis of coal-mine subsidence, so that the information provided by mine operators can be made available electronically to the Department and to the public. The 5<sup>th</sup> Act 54 Report does not address this issue.

**The Council recognizes recent minor efforts made by the Department and recommends that it diligently continue its work to this end.**

#### **Issue 18. Data Entry and Quality Control**

The Council acknowledges minor steps made by the Department recently in seeking to upgrade the quality of data entered into BUMIS. Clearly, significant additional efforts still are needed to use BUMIS (and essential supplemental software) effectively to track and analyze subsidence impacts. **BUMIS should be replaced by modern software compatible with other Department data management systems. (See extended discussion under Item 15 above.)**

## **Issue 19. Hydrologic Effects of Underground Bituminous Coal Mining**

**The Council continues to recommend that the Bureau of Mining Programs improve its methods to assess the hydrologic effects of underground coal mining, including cooperation with the Bureau of Abandoned Mine Reclamation and the Division of Water Programs.** Such work clearly is needed according to the 5<sup>th</sup> Act 54 Report.

## **Issue 20. Acquisition of Data Produced by University of Pittsburgh**

In 2015 the Council noted the extensive and costly work done by the University of Pittsburgh during both the 3<sup>rd</sup> and 4<sup>th</sup> periods to prepare a GIS database and incorporate into it the Department's data from BUMIS, from permit applications, and from other sources for analysis and report preparation. Hence it recommended that the Department acquire all such data.

The Council notes with disappointment that the Department still has no knowledge of the basic GIS data generated during preparation of its four contracted Act 54 Reports and has not sought to acquire the databases from the preparers. For its part, the contractors appear to remain unable or unwilling to supply any part of past mining analyses other than the report documents.

**All data prepared at taxpayer expense should be made available to the Department at the end of every Act 54 Report project, at least beginning with the contract for the 6<sup>th</sup> Act 54 Report.**

## **Issue 21. Data Policy for Water Supply Impacts**

In 2015 the Council recommended that the Department develop a written policy identifying the Department's responsibilities for tracking water supply impacts on BUMIS or a successor database. No action has been taken on this recommendation, and the 5<sup>th</sup> Act 54 Report documents several data gaps.

**Thus, the Council again recommends the development of a detailed policy with sufficient protocols to assure proper collection and analysis of data associated with underground-mining impacted water supplies.**

## **Issue 22. Public Access to Act 54 Impact Data**

The Council in 2015 acknowledged a high level of public skepticism regarding mine impact data in the 4<sup>th</sup> Act 54 Report. Comments received by the Council on the 5<sup>th</sup> Report show that public concern continues (See **Appendices C, D, and E**). The Council notes in particular that the limited updates from BUMIS posted on the Act 54 web page since publication of the 5<sup>th</sup> Report in no way begin to substitute for the information required by Act 54 for analysis and presentation in 5-year reports.

**Thus, the Council repeats its 2015 recommendation that information available in BUMIS or more functional programs and databases be made publicly available through secure internet sites in order to maximize transparency and assure that all parties are accountable for their responsibilities under Act 54.**

### **Issue 23. Landowner Rights**

In 2015 the Council applauded Department efforts to disseminate public information on the rights and responsibilities of landowners under Act 54. **The Council recommends the Department continue its ongoing efforts to educate landowners about Act 54.**

### **Issue 24. Cooperative Measures to Assess and Mitigate Impacts**

In 2015 the Council recommended that the Department cooperate with partner agencies at the federal, state, and local levels to better identify and assess the impacts of underground bituminous coal mining and to predict, avoid, and minimize such impacts. **The Council believes that many additional opportunities for such cooperation still exist and should be pursued diligently by the Department.**

### **Other Questions**

The foregoing issues and recommendations were followed in the Council's 2015 Comments document by eleven questions posed to the Department. The Council is not aware that these questions ever were answered by the Department. They are left unresolved in the 5<sup>th</sup> Act 54 Report.

**The Council repeats these questions to the Department, inasmuch as their answers continue to bear great relevance to the administration of Act 54, and most of the same questions arise in the 5<sup>th</sup> Report as well:**

1. Two of the five stream investigations conducted by the Department during the 4<sup>th</sup> assessment period were found to have relied on inadequate data and observations before reaching determinations that impacts were not due to underground mining. When will the Department reassess these streams and provide the results of the reassessment to the public?
2. What additional resources or data are needed by the Department to perform a comprehensive Cumulative Hydrologic Impact Analysis?
3. What are the Department's protocols for the timeliness and frequency of inspections of underground mining operations?
4. What are the consequences to mine operators who do not accurately predict or plan for impacts from their operations?
5. When a company is determined liable for water contamination, diminution or interruption, does the Department issue an order compelling the company to resolve the issue promptly or does the Department initially rely on voluntary compliance by the operator to address the situation?
6. Is the Department independently tracking impacts to streams and wetlands on state-owned land or is that information being tracked solely on data reported to the Department by the mine operator?
7. When mine operators own property that has experienced impacts to aquatic resources or water supplies, is the mine operator required to report and repair those impacts?
8. Aside from information provided by a mine operator, what information or analysis does the Department use to determine whether stream restoration measures successfully return those streams to their full hydrologic function?

9. What is the Department’s position on the statement included in the report that new/replacement wetlands do not functionally replace the complexity and resources that were provided by the original wetlands? Is further research warranted by the Department on the functionality and complexity of wetlands?

10. The 3<sup>rd</sup> Act 54 Report included a list of all 50 active mines and identified the number of structures, water supplies, and properties undermined by each, as well as the number of stream miles undermined by each. The 4<sup>th</sup> Act 54 Report identified only the number of stream miles undermined by each mine, but not the number of structures, water supplies, or properties.

a) Why were similar data not included in the 4<sup>th</sup> Report as in the 3<sup>rd</sup>?

b) Was that information collected but not reported, and if so, why?

11. Eight of the 55 streams determined to be affected in the 3<sup>rd</sup> Act 54 report (2003-2008) have yet to recover to pre-mining conditions. Does the Department anticipate initiating a detailed study of these streams to determine why they have yet to recover to pre-mining conditions?

## Appendices.

<b>A. Council’s Act 54 Work Group’s Review of Stream Recovery Evaluations submitted during the 5<sup>th</sup> Act 54 Report Period (November 2022)</b>	Pages 15-21
<b>B. Responses to Council’s Advice</b> (including DEP Sept. 2020, S. Kunz Feb. 2016, CCC May 2021 & Dec. 2021)	Pages 22-87
<b>C. Consolidated Public Comments on the 5<sup>th</sup> Act 54 Report</b> (by K. Salador, June 2022)	Pages 88-103
<b>D. CCJ Written Comments</b> (S. Winner CCJ, T. Schuster SC, & M. Marshall MWA, April 2021)	Pages 104-115
<b>E. Summary Historic Recommendations on Act 54 Reports from DEP and from Council</b> (S. Kunz, powerpoint presented to Council at its January 2021 meeting)	Pages 116-123

## Appendix A.

### **Council's Work Group Report on SREs filed during the 5<sup>th</sup> Act 54 Report (2013-2018)**

Stream Recovery Evaluations (SREs) prepared by consultants provide the pre- and post-mining monitoring data that permittees believe demonstrate sufficient biological recovery of stream segments dewatered or pooled following longwall mine subsidence. Copies of those SREs addressed briefly in the 5<sup>th</sup> Act 54 report were requested from the Department to enable a review of the Department's evaluation of stream recovery claims following damage by subsidence after longwall (high-extraction) coal mining. During June 2022 eighty-six SRE files were provided to the Citizens Advisory Council. Three files listed in the 5<sup>th</sup> Report (#1401 84 Mine, #1512 Harmony Mine, and #1618 Cumberland Mine) were not provided.

The evaluations follow either natural stream recovery or permittee efforts to restore or maintain flow in the streams and to remove or mitigate sedimentation of the stream substrate. The SREs seek to document the resumption of normal stream flow and the recovery, if any, of the benthic macroinvertebrate communities. Each SRE requests a release from further monitoring, and usually announces the permittee's termination of monitoring pending formal release by the Department. There is no record of any Department objection to the cessation of monitoring or request for its resumption. A few amended SREs provide additional flow monitoring data after the initial submission, presumably in response to oral requests from Department staff. Public notice is to be made of stream segments that a permit applicant deems likely to need mitigation, but public notice of actual damage incurred and of submitted SREs or of formal monitoring release after stream recovery is not undertaken.

According to the Department's 5<sup>th</sup> Act 54 report prepared by the University of Pittsburgh, 82 SREs were submitted during the period 21 August 2013 through 20 August 2018 (Table 9-5). Final release from recovery monitoring reportedly was granted by the Department based on 42 reports (51%). Not released from monitoring by the end of the period were the streams addressed by 40 reports (49%) presumably deemed interim by the Department.

5<sup>th</sup> Report Table 9-6 provides further information on the status of each SRE. Data in the two tables are not easily compared, inasmuch as the University sought to order the SREs by stream segment rather than by SRE number, thereby combining some SRE files and splitting others.

Most of the SRE files provided in 2022 contained no information subsequent to mid-2018. One of the 2022 files (#1751) contained only a release letter dated September 2019, with no supporting SRE data or technical review. Two of the 2022 files (#1755 and #1756) contained additional flow data review by Department staff of permittee data and recommendations to release those streams dated November 2021. (No biological data were included.) These three files addressed tributaries to Tenmile Creek damaged by the Enlow Fork Mine.

The first question addressed here concerns the accurate reporting of stream recovery (release) status in the 5<sup>th</sup> Act 54 Report, based on the 86 files provided in 2022. 5<sup>th</sup> Report Table 9-6 misdescribes four Enlow Fork SREs as "not released," although they in fact were released during the 5<sup>th</sup> period. (Three

additional Enlow Fork SREs were released after the close of the 5<sup>th</sup> Report period, so were properly reported as unreleased.) The three SREs not provided in 2022 could not be reviewed and are omitted from Table A below. The results show that Department acceptance of SREs varied widely by mine.

**Table A. SREs from the 5<sup>th</sup> Act 54 report period (August 2013-August 2018) provided to the Citizens Advisory Council in June 2022.**

Mine	# of SREs submitted 2013-2018	# of SREs Released	# of SREs Not Released
Bailey	18	12 (67%)	6 (33%)
Enlow Fork	45	16 (36%)	29 (64%)
Cumberland	11	11 (100%)	0
Emerald	4	3 (75%)	1 (25%)
Monongalia	7	0	7 (100%)
84	1	0	1 (100%)
Total	86	42 (49%)	44 (51%)

In 23 of the SRE files there were no Department staff technical comments at all. (Any staff assignment forms were blank.) Most of these SREs were deemed interim, incomplete submissions from permittees, of which 20 apparently remain unreleased in 2022. (No further information was provided in the 2022 files regarding recovery of those 20 streams.) Four of the SREs (#1402 and #1501 Cumberland; #1516 and #1603 Bailey) were granted final release despite the absence of any sign of staff review or comments in the files. Sometimes DEP asks a permittee for additional information to supplement a report (usually orally with no mention in the file; but sometimes there is an e-mail thread included recording back-and-forth between Department staff and permittee consultants).

There is no mention of any performance bonds being required to cover the monitoring of stream recovery, or any release from bonding once monitoring is authorized to cease, in any SRE. (The stream protection TGD presumes that performance bonds are required to assure implementation of mitigation plans, but does not specifically mandate the inclusion of monitoring costs in a performance bond.) One instance of a six-month gap in SRE flow monitoring was reported by consultants when mine ownership changed. It is odd that the monitoring did not continue uninterrupted, if its cost was in fact covered by a performance bond as expected per TGD 563-2504-001.

By 2018 some years had passed since the mining of each of the 86 streams addressed by these SREs. Longwall mining beneath several of the streams was permitted prior to adoption of Technical Guidance Document 563-2000-655 during October 2005. For those streams pre-mining flow and/or biological data were not available. Eight of the non-control-stream SREs (9%) lacked all pre-mining flow data, and 22 (26%) lacked all pre-mining biological data.



Permit applications submitted after October 2007 were expected to include a full two years of pre-mining flow data as well as biological data. It is not possible to tell from an SRE alone whether pre-mining data were provided with the permit application or were developed later prior to actual mining. Only three of the SREs (#1525, #1627, and #1628) attempted to use “control” streams for recovery evaluations, and the two latter were released. Control streams, however, did not always meet the TGD definition which requires strict comparability with eight aspects of the dewatered stream, and permittee consultants pointed out the incompatible features.

Most of the SRE authors claim to have followed the Department’s methodology as set forth in the 2005 technical guidance. Few if any, however, appear to have followed it strictly. No SRE makes reference to any stream mitigation “plan” that either formed part of the mining permit application or was prepared later following observation of unexpected stream damage. Whether flow loss (or pooling) at the subject stream had been predicted or not is never stated. For streams where no flow loss was predicted, of course, pre-mining flow data collection would not be expected, rendering documentation of post-mining recovery difficult. In virtually none of the SREs were stream flows reported at the frequency specified by the TGD for all monitoring plans requested where there is an anticipated or observed loss of flow:

IV.1.d.(v) A monitoring plan that provides for flow measurements at representative stations according to the following schedule:

(A) Weekly measurements commencing six months prior to undermining the area of concern.

(B) Daily measurements commencing two weeks prior to undermining the area of concern and continuing until the potential for mining induced flow loss becomes negligible. (In the case of longwall mining daily measurements should continue until the longwall face has progressed a distance equal to the cover thickness beyond the area of concern.)

(C) If flow loss occurs, daily observations or measurements commencing from the date of the observed loss and continuing until flow fully recovers or is fully restored or until underground mining operations are determined not to be the cause of the problem.

(D) Weekly measurements continuing six months after the conclusion of daily monitoring under (B) or (C) above.

(E) Corresponding measurements of flows in control streams (if applicable).

[TGD 563-2000-655 / October 8, 2005 / Page 12]

These provisions of the TGD apparently are not of much concern to the Department. Compliance with the monitoring frequency requirements is never mentioned in staff review comments in any SRE file. SREs are prepared only for streams known to have experienced a subsidence-related loss of flow, whether predicted or not. In any case, it is not possible to determine whether the directives of subsections (A), (B), or (D) were followed in any SRE, because the relationship between the longwall face location and the dates of stream monitoring is nowhere mentioned in any SRE.

In particular, no instance of data in compliance with subsection (C) could be found in any of the SREs reviewed. Unexplained gaps always exist between the end of reported pre-mining flow data measurements and the resumption of flow data collection post-mining. Such gaps are never shorter

than 2 to 3 months, and may persist for years. The longest pre/post flow data gap in these SREs is 72 months (6 years). It is not clear whether there was any flow in the stream during the monitoring gap.

Various statistical and graphical summaries of stream flow data were made in the SREs to bolster a consultant conclusion that post-mining flow had recovered. The methodologies used were nowhere explained. Such hydrologic analyses are not simple, given the erratic flow sampling superimposed on the variable (intermittent) flow of many streams in response to precipitation events. There are few records of local precipitation events; most SREs contain none. Some permittee consultants say they include all streamflow measurements in their SREs. Others specifically acknowledge deleting all monitoring results during periods of flow augmentation, drought, drought warnings, or major storms, although it is unclear in the monitoring data when those events occurred or whether in fact they were deleted from the results. The resulting flow records appear erratic in scheduling and are not very informative. Sometimes landowners deny consent for monitoring when specific authorization for mine operator monitoring and mitigation activities were not secured prior to permit approval; hunting season usually causes other gaps.

Wolman pebble counts for areas where pooling is anticipated are specified by the TGD. Few mentions of pooling occur in the 5<sup>th</sup> Report SREs, and no post-mining pebble counts were provided or compared with any pre-mining counts for pooled stream segments. No fish data appeared in any SRE.

In quite a few SREs the conclusions of biological analyses following the TGD's preliminary Appendix A (best riffle macroinvertebrate inventory) and full Appendix B (inventory of multiple habitats along 300 feet of stream) were reported. Per the TGD, Appendix A analysis is to be performed on all potentially affected streams to identify the location of biologically diverse and biologically variable segments before and after mining.<sup>2</sup> Those segments typically are displayed on drawings in each SRE for pre-mining and post-mining conditions. Total Biological Scores (TBS) can be compared only for those sampling stations on biologically diverse streams with both pre-mining and post-mining Appendix B data. Appendix B field data sheets usually were included in the SREs. When they were the only data available, Appendix A field sheets were included in SREs. Appendix A field sheets, however, almost never were attached when Appendix B field data were included.

In some instances biologically diverse streams became biologically variable; few biologically variable stream segments became diverse. SREs always described such changes as insignificant. (The TGD sets forth no thresholds for allowable change.) SRE-reported post-mining TBS scores always fell within the TGD-allowable 88% of pre-mining scores considered to represent aquatic ecosystem recovery. Some post-mining TBS scores exceeded those collected prior to mining.

Department staff used their discretion to release streams with questionably recovered flow where biota showed recolonization and to release streams without demonstrated biological recovery where flow

<sup>2</sup> The following terms in quotation marks are defined in the TGD's Appendix A: "Biologically variable" stream reaches are those reaches where a minimum of two taxa of macroinvertebrates that require water for part of their life cycle are found. "Biologically diverse" stream reaches have more taxa. These terms, of course, only refer to the protected aquatic life use and cannot be used to assess other uses.

appeared to be adequate. Department review staff actual field inspections are mentioned in about one third of the SRE files. Sometimes the views of the Department's shadow inspectors (Surface Subsidence Agents) are included on review forms in an SRE file.

The SREs vary widely among permittee consultants regarding the information provided. Some consultants diligently report stream length, watershed size, designated uses, and start/stop dates of longwall mining beneath the stream in the SRE. Some of the graphics are of high quality and credibly portray the subject streams. Points of discharge of flow augmentation water often are displayed, and sometimes augmentation well locations also are shown.

Nowhere in any SRE or any Department staff comments is there any suggestion that Special Protection waters were treated in any way differently from non-Special Protection waters. Stream uses are not noted on Department review forms. (Both Cumberland Mine and Enlow Fork Mine have affected several HQ-WWF streams.) Few mine operator consultants report the geographical extent or duration of damages observed, which can include dewatering, streambed fracturing and/or heaving, or pooling on the upstream sides of gates. No plan drawings or narratives describe any specific mitigation efforts, although the Department may have reviewed and approved such measures in advance during permit review or following the occurrence of unanticipated damage. Even major interventions for mitigation, such as liner installation, receive only bare mention.

Apparently plans for restoration are not deemed relevant to SREs by the Department. Sometimes Department staff very briefly identify the extent of damage and kinds of mitigation attempted (flow augmentation, sediment removal and stream bed earthwork, streambed boring and grouting, gate cutting) and may include the date when such work was concluded on their review forms.

Some permittee consultants show the extent of riparian wetlands along the subject stream on SRE drawings; none shows wetlands outside floodplains. No Appendix C wetland survey forms from TGD 563-2000-655 were included in any SRE. Wetland reduction was acknowledged in SRE #1611, and four years of vegetation monitoring are mentioned in SRE #1612 (Enlow Fork Mine), but no substantive wetland information is provided in these files. Wetland monitoring also is mentioned in #1615 (Enlow Fork Mine), but results are not included in that SRE file. Likewise, the Corps Nationwide Permit 27 for stream restoration at 84 Mine apparently required five years of monitoring, but none of that information appears in #1505 (where monitoring responsibility apparently has not been released). It is puzzling that the Department did not require the Corps monitoring information be included in the SRE file.

Flow augmentation is the most common mitigative measure undertaken for subsidence-dewatered streams. Very few data on such augmentation are provided and only in a small minority of SREs. Augmentation of flow apparently occurs "as needed" in the view of the permittee. It is not clear on what basis or by whom the need for flow augmentation on any given day is established. Augmentation apparently is not helpful prior to streambed modification, sediment removal, and grouting on some streams, but no details appear in the SREs. For the very few SREs that report augmentation rates (gallons per minute) by date, there is no indication of how the highly variable rates were established or controlled. When and how much flow augmentation is considered to be warranted on mainly intermittent,

headwater streams is nowhere discussed in these SREs. Augmentation is never addressed in relation to watershed size. The quantity of water released is never stated, and its quality is never mentioned.

Indications of the augmentation water's source usually are absent (unless wells happen to be shown on the SRE drawings). There appears to be no permitting or quality sampling required for discharge of water to dewatered streams, whether the source be a well or a chlorinated public supply. Sometimes there is mention that an owner complained that a stream augmentation well damaged his household well, but these scattered instances are never fully reported in an SRE.

Apparently the Department has often granted "reprieves" from augmenting flow, typically during the dry season, presumably always by means of oral request and approval. There is just an occasional mention by reviewers of SREs of reprieves having been granted, with no elaboration. Dates of non-augmentation as a result of reprieve or any other cause are not recorded.

A majority of the DEP releases of stream recovery monitoring appears to be based on credible documentation according to some kind of DEP-accepted methodology, but certainly not all. Each SRE claims to follow the Department's TGD, but the levels of documentation are inconsistent both for flows and for biota. The TGD provides no specific guidance for analysis of stream flow.

Sometimes Department staffers record reluctance to recommend release without a current field inspection, given the incompletely recorded variability of post-mining flows. But those streams usually are released anyway.

**The absence from the SREs of a description of what damage was predicted (accurately or inaccurately), what damage actually was observed and when, what corrective measures were undertaken when and where, and when flow return was observed is remarkable. Pre-mining data are scarce for streams where subsidence damage was deemed unlikely as well as for streams permitted prior to implementation of the 2005 TGD. Dates of biological recovery are not addressed. It is virtually impossible to determine from the data provided how long one or more stream uses remained impaired between subsidence damage and claimed recovery. Impairment of many of these streams persisted for years.**

**This leads to a number of recommendations for immediate action by the Department to implement the following measures promised back in 2005:**

- 1. The Department should provide a template for SREs to remind permittees of appropriate information that should be included in each claim that restoration is complete on each actually damaged stream segment.**
- 2. Whether damage to this stream at this location was predicted should be stated, and the accuracy of the damage prediction noted by comparing the prediction with the actual damage.**
- 3. SREs should clearly identify where dewatering occurred and on what specific dates (a) loss first occurred and (b) flow was deemed restored to normal.**
- 4. Flow loss persisting longer than 1 year, and thus constituting "pollution" should be specifically acknowledged in each SRE.<sup>3</sup>**

<sup>3</sup> Per #78 on p. 26, 2005 Comment and Response Document for TGD 563-2000-655.

5. SREs should clearly identify when flow augmentation occurred, with daily rates, volumes, and the basis for determining the need for the reported volumes.
6. SREs should describe in detail instances where the absence of a landowner agreement for permittee mitigation or monitoring activities delayed initiation of mitigation measures.
7. SREs should explain whether prior measures (such as sediment removal, streambed modification, and/or grouting) were required in order to render augmentation effective or unnecessary.
8. Major stream reclamation efforts such as liner installation should be fully described, along with the effectiveness (or lack) of plans submitted with the permit application.
9. The quality of augmentation water should be compared with stream water quality and reported in SREs.<sup>4</sup>
10. SREs should include documentation of pre- and post-mining conditions such as the location of riffles, pools, glides, and runs.<sup>5</sup>
11. Pre-mining and post-mining Wolman pebble counts should be provided in each case of pooling, as directed by the TGD and expected by the Department.<sup>6</sup>
12. Information should be provided on the need for sediment removal and quantity removed from each pool.<sup>7</sup>
13. SREs should include the results of fish sampling.<sup>8</sup>

<sup>4</sup> Per #108 on p. 16, 2005 Comment and Response Document for TGD 563-2000-655.

<sup>5</sup> Per #39 on p. 16, 2005 Comment and Response Document for TGD 563-2000-655.

<sup>6</sup> Per #39 on p. 16, 2005 Comment and Response Document for TGD 563-2000-655.

<sup>7</sup> Per #111 on p. 34, 2005 Comment and Response Document for TGD 563-2000-655.

<sup>8</sup> Per #89 on p. 28, 2005 Comment and Response Document for TGD 563-2000-655.

## Appendix B.

### **Responses to Council's Advice on Underground Bituminous Coal Mining**

As directed by Act 54, the Council has reviewed each of the Department's 5-year reports on underground bituminous coal mining, has held public hearings, and has prepared written comments. Council's comments have been transmitted formally to the Department, to the Governor, and to the General Assembly and have been posted on the Council's web page ([www.dep.pa.gov/PublicParticipation/CitizensAdvisoryCouncil/pages/default.aspx](http://www.dep.pa.gov/PublicParticipation/CitizensAdvisoryCouncil/pages/default.aspx)). This appendix briefly reviews responses to the Council's advice during recent Act 54 mining report periods.

The Department's responses to the Council's (and the affected public's) comments based on the solid data and analysis in Act 54 Reports for the 2<sup>nd</sup> through 5<sup>th</sup> periods (20 years) have been few, and responsive changes to the underground mining program have been minor and very slow at best in their partial implementation. Most of this Appendix recounts the details of those responses. The Department's current plans for future disclosure of impacts, which consist of occasional disclosures of skeletal, unexplained, and contradictory data from BUMIS posted on its web page, appear headed to repetition of the 1<sup>st</sup> Act 54 report. That "report" was prepared by the Department in-house, and (even after supplementation) was judged a disaster by the Council, the public, and the General Assembly. The

failure to implement its adopted regulations and to insist upon implementation of guidance in its primary technical remedy (TGD 563-2000-655) appears to stem from a program-wide determination to “kick the can down the road” when questions of predicting, avoiding, minimizing, and attempting to reverse mining impacts emerge.

No direct response has been received from the Governor or from the General Assembly to the Council’s advice concerning the impacts of underground coal mining. At the request of the mining industry and the Department, without entering into discussion with the Council, the General Assembly and the Governor approved the following amendment to the Bituminous Mine Subsidence and Land Conservation Act and the Clean Streams Law, retroactive to 8 October 2005 (in its Act 32 of 2017):

Section 5. (i) In a permit application to conduct mining operations subject to this act, planned subsidence in a predictable and controlled manner which is not predicted to result in the permanent disruption of premining existing or designated uses of surface waters of the Commonwealth shall not be considered presumptive evidence that the proposed bituminous coal mining operations have the potential to cause pollution as defined in section 1 of the act of June 22, 1937 (P.L.1987, No.394), known as "The Clean Streams Law."

That is, stating some intent to repair any reported damages would be adequate for Department approval of mining permits, whether or not actual repair could ever be achieved. Supporters of this special legislation favorable to longwall mine operators claimed that it would serve merely to confirm actual practice of the Department since 2005. In the view of the Council, inasmuch as protracted disruption of water uses is *never* predicted but often experienced, and serious efforts at accurate prediction are not made, implementing this amendment would not advance the goals of protecting aquatic resources or protecting the public from the impacts of underground mining. Fortunately, lawful implementation of this amendment cannot proceed unless and until federal approval of relevant changes in Pennsylvania’s mining program is secured from the OSMRE [30 C.F.R. § 731.17(g)], and approval from the US Environmental Protection Agency is granted for changes to State Water Quality Standards [40 C.F.R. § 123.62].

*A day late and a dollar short* regrettably characterizes the Department’s responses to the Council’s comments on the Department’s Act 54 5-year Reports. Beginning in March 2015, Department staff from several Bureaus prepared a 43-page internal review of its 4<sup>th</sup> Act 54 5-year Report (covering 2008-2013). That review responded to mining-program and data-handling recommendations made in the 4<sup>th</sup> Report by its university contractor, as well as comments by the Council and by the public via the Council’s public hearings. The final 4<sup>th</sup> Report had been provided to the Department by the University of Pittsburgh on 30 August 2014 and was published online by the Department on 22 December 2014. The Department’s internal review text and spreadsheet were published on 16 November 2015. The Council posted that 4<sup>th</sup> Report review document on its web page; public comments on it, as received by the Council in 2016, are attached below, following the Department’s shorter 2020 spreadsheet addressing specific contractor recommendations in the 5<sup>th</sup> Report.

It is puzzling that the Department began to address the contents and recommendations in its own 4<sup>th</sup> and 5<sup>th</sup> Act 54 Reports months after those reports were published. Apparently the Department was not closely involved with 4<sup>th</sup> Act 54 report preparation and did not read or modify its contractor’s recommendations during the 4-month interval between final report receipt and its publication by the

Department in 2014. The Department's 2015 review spreadsheet addressed 95 specific recommendations of its contractor. Mining program staff discussed those findings with the Council on 4 February 2016. It then prepared work plan spreadsheets showing intended programmatic responses with timetables in March, April, and May 2016 and again (after a question from the Council) in September 2017. Despite a promise made on page 3 of its 2015 review text, the results of its post-4<sup>th</sup> Report changes made are nowhere mentioned in the Department's 5<sup>th</sup> Report text or reflected in the 5<sup>th</sup> Report data or in Stream Recovery Evaluations submitted during the 5<sup>th</sup> period. Perhaps the results of its regulatory changes will begin to be detectable in the 6<sup>th</sup> Act 54 Report (2018-2023), if the Department elects to point them out.

The Department's responses to comments by the Council and by others that were provided on the 4<sup>th</sup> Act 54 Report are incomplete and disappointing. (See below the February 2016 public comment letter to the Council addressing the Department's November 2015 internal work group review of the 4<sup>th</sup> Act 54 Report.)

The Department published its 5<sup>th</sup> five-year Act 54 Report on its web page on 20 December 2019. The Bureau of Mining Programs released in September 2020 the spreadsheet below responding to forty of its contractor's specific recommendations in the Department's 5<sup>th</sup> Report---12 months after the Bureau received them in final form and 9 months after the 5<sup>th</sup> Report itself was published by the Department. Like Department's responses to the 4<sup>th</sup> Report, the substance of many responses suggests that minimal coordination with the Department occurred during 5<sup>th</sup> Report preparation. Unlike the Department's 2015 internal review, however, the 2020 spreadsheet response has no accompanying text. Once more, the Bureau apparently had little knowledge of "its own" 5<sup>th</sup> Report's contents until long after that report itself was published. Again, few of the longstanding concerns of the Council and the public were addressed by the Department in its spreadsheet reply to its contractor's recommendations following the 5<sup>th</sup> Act 54 Report.

The Department's spreadsheet below responds to the forty 5<sup>th</sup> Report contractor recommendations using six categories: wetlands (4), data collection and analysis (7), sampling/monitoring (11), process (11), stream recovery evaluations (6), and other (1), each keyed to page numbers in the 5<sup>th</sup> Act 54 Report. Some minor recommended improvements appear to have been accepted. Given the overlap between many of the contractor's recommendations and those of the Council, the responses of the Department provide insight into how recurrent problems of program implementation currently are viewed by the Department and how they still fail to address longstanding, major concerns of the Council and the public.

Some examples in the spreadsheet are worth mentioning:

**(Issue #5)** BUMIS may be adequate for recording the number of reported mining impacts but is not a functional source for 5-year report analyses aimed at understanding trends in successful impact restoration and other patterns of environmental and community damage important to decisionmakers and the public,

**(Issue #8 and #28)** adequate recordkeeping in the future enabling improved damage prediction and understanding of mitigation success remains unlikely,

**(Issue #9)** electronic data submission currently being implemented probably would help the Department greatly if all monitoring data are verified as accurate and are routinely reviewed by the Department,



**(Issue #10)** the Department continues to display little concern with the geographical accuracy and content of data, yet both are essential to understanding and predicting mine subsidence impacts,

**(Issue #11)** the actual mileage of streams damaged by mining may not be reported accurately in the foreseeable future,

**(Issues #18, #20, and #23)** the Department has no plans to secure from operators all the data promised since 2007 by TGD 563-2000-655, but will await future revision of this TGD; then that revision itself may or may not be enforced (if past practice is any guide),

**(Issues #25 and #37)** the Department has barely begun to identify the appropriate permittee information necessary to form credible Stream Evaluation Reports,

**(Issue #27)** the Department intends to continue “discussing” the inordinately long time frame allowed without penalty for restoration of disrupted stream uses, but it will take no action prior to some anticipated future TGD revision,

**(Issue #34)** adoption of modern methods for recording meaningful stream hydrology will not proceed in advance of some future TGD revision, despite the technical findings of the USGS in 2019,

**(Issue #36)** the Bureau of Mining Programs is planning to adopt the Department’s updated methodology for measuring the biotic integrity of streams in its to-be-revised TGD, but it has not addressed comparability of data from pre-mining (old methodology) and from post-mining (new methodology) when judging stream recovery, and

**(Issue #38)** the Department has no intent to require fish data in applicants’ pre-mining surveys, as promised since 2005 by TGD 563-2000-655 (per #89 on p. 28, 2005 Comment and Response Document for that TGD); moreover, several other data “requirements” in the 2005 TGD have never been implemented, as discussed above in **Appendix A** to these Comments.

Public comments on the first two post-5<sup>th</sup> Report updates from BUMIS were provided to the Department by the Council in May and December 2021 (included below). There was no written response from the Department. Minimal improvements to the online postings have been made. Skeletal spreadsheet data from BUMIS, published online by the Department for the period early 2018 through mid-2022, indicated 81 active underground mines during that period affecting 20 square miles of permit areas (12,905 ac). Longwall methods still generate most of the impacts from underground bituminous coal mining. Reported incidents during this early 6<sup>th</sup> Report period involving damage to structures totaled 442 (13% not mine-liable); land damages, 104 (12% not mine-liable); water supply loss, 263 (30% not mine-liable); water supply contamination, 171 (48% not mine-liable); water supply methane intrusion, 2; stream flow loss, 91 affecting 14.2 miles; pooling, 26 affecting 2.4 miles; utility damage, 3 (1 not mine-liable), and wetlands, 201 affecting 16 acres. Thus damages continue, mostly unrepaired, and there clearly is need not only for a 6<sup>th</sup> Act 54 Report but for actual enforcement of existing statutes and regulations by the underground mining program.

Serious proactive work is needed on behalf of this Commonwealth---our land, air, water resources and our mining communities! The three serene monkeys of Japan who see no evil, hear no evil, and speak no evil are the wrong model when it comes to the impacts of Act 54 underground coal mining in Pennsylvania.

Here are the Department’s September 2020 spreadsheet responses to contractor recommendations in the Department’s 5<sup>th</sup> Act 54 Report (there is no accompanying text):

*ACT 54 REPORT #5 Recommendations and Response Table  
September 2020  
Prepared by DEP Bureau of Mining Programs*

**ACRONYMS USED**

BMP – Bureau of Mining Programs  
CalDMO – California District Mining Office  
BUMIS – Bituminous Underground Mining Information System  
University – U. of Pittsburgh

NUMBER	COMMENT/RECOMMENDATION	PAGE	RESPONSE
<b>WETLANDS</b>			
1	Include wetlands in database.	4	The mining program is actively working on incorporating wetlands data into a more useable format than just on paper. Digitizing the backlog of wetlands data during the report period has been completed. The next step will be to finalize what attributes will be tracked. The wetland tracking would be similar to the way the Department tracks stream effects, possibly in BUMIS. Using an online version of ArcMap, it is anticipated the Department can eventually allow public access to this wetland data.
2	The University recommends that the PADEP enforce its policies regarding wetland mitigation report submission in order to better monitor the progress of these mitigation projects and increase transparency.	12-10	To address timeliness of the reporting, the proposed “wetland” section in BUMIS noted in the response to Comment #1 will have an alert system that will trigger for specific report due dates. This same alert system is currently used in the BUMIS “stream impact” section and works well. This alert system will also provide CalDMO personnel time to inform the operator of their responsibilities. Progress of projects will eventually be reflected in the online tool as well.  Due to personnel changes that occurred during the time period of the 5th report, several wetland progress reports were not logged and supplied to the University. CalDMO has since resolved this issue.
3	The University recommends that PADEP initiate a quality control process to ensure that wetland delineations are performed in a consistent manner across mines and over time.	12-11	The Department will consider creating a standard procedure or checklist for the submittal and review of wetland data.
4	The University recommends that wetland data be submitted by all longwall mine operators in a georeferenced vector-based format (e.g. shapefile, .dwg) compatible with GIS software. The professional standard is to identify different types of delineated wetlands separately and defined in a “type” field. Metadata for all wetland delineations are needed for this layer (e.g., date delineated, wetland delineator, species observed).	12-11	The Department will revise the permit application documents to request all wetland data be submitted in a georeferenced vector-based format (e.g. Shapefile, .dwg) compatible with GIS software. Also, please see the response to Comment #1 on the digital formatting of wetland data.

DATA COLLECTION AND ANALYSIS			
5	<p>The University strongly recommends that the PADEP modernize the BUMIS data system and infrastructure. This underlying structure has to be compatible (i.e., simple for a common user to open, manipulate, and evaluate data) with the everyday tools their staff uses, from analysis packages to GIS packages. The database software has to be versatile and adaptable to future challenges and changes in analysis needs. It needs to allow interaction among employees across PADEP. This is potentially the most important recommendation and a consistent theme through three assessments.</p>	<p>4, 2-7, 12-2, 13-4</p>	<p>To clarify, BUMIS is an internal database used solely by Department staff to securely record and monitor the progress of mining impacts on water supplies, structures, streams and more. Due to the amount of personal data stored within BUMIS, it cannot be made available to other state employees or the general public. The Department does not use BUMIS to analyze the data. This comment from the University reflects the difficulty in exporting the database contents outside of the Department systems, which is admittedly cumbersome. However, for its intended purpose of securely recording and monitoring progress of mining impacts, BUMIS functions adequately.</p> <p>The addition of GIS capabilities in BUMIS would be beneficial, but doing so would be a large undertaking and require additional funding. However, in an effort to allow for visualization of location data in BUMIS, the Department is in the process of trying to extract the data and use it in other existing GIS tools. Also, in late 2019, BMP began integrating the BUMIS database with Microsoft's Power BI software in order to organize and analyze the data contained in BUMIS and make it much easier to provide more frequent, regular reporting to the public. (Please also see the response to Comment #30.)</p>
6	<p>The University recommends creation of infrastructure to allow for electronic submission of data or expand requirements for electronic submission to improve efficiency and accuracy. Barriers to electronic submission need to be eliminated. Transcription and organization necessary to answer questions slows progress and wastes effort.</p>	<p>2-7, 12-3, 12-5, 13-4</p>	<p>The Department agrees that digital submission is preferable and has previously requested that operators submit permit application information in an electronic format for specific modules. Presently, some operators are complying while others are not, but there has been progress.</p> <p>The Department will examine requirements for applicants and permittees to submit electronic content instead of paper but may not be able to mandate this requirement. As allocation of resources allows, BMP is moving towards implementing systems for the electronic submission of data with the current focus on submission of discharge monitoring reports for NPDES permits. Eventually, all monitoring reports will be via electronic submission.</p>
7	<p>Groundwater impacts are not tracked in BUMIS, and groundwater hydrologic monitoring and water supply loss data are not formally included in examination of stream recovery. Integration of subsidence impacts with broader hydrological management frameworks would make the subsidence impacts and repairs more apparent to all citizens of the Commonwealth.</p>	<p>7-3, 11-6</p>	<p>In May, a new Standard Operating Procedure (SOP) for completion reports was finalized to address review of all monitoring data, complaints and stream recovery data (Hydrologic Assessment and Completion Reports for Underground Coal Mines SOP (No. BMP-010)).</p> <p>The Department will also begin requiring operators to submit the pre- and post-mining piezometer data in the water loss and Stream Recovery Evaluation reports. Evaluation of database options in ARCGIS or BUMIS will occur at a later date.</p>

8	The University recommends that gate cuts be tracked in BUMIS: each mitigation event be entered separately (only one type of mitigation per entry) and that all active mitigation projects be entered, regardless of when the stream was undermined; important corresponding information (metadata) be included for each mitigation event, such as panel information and release date.	12-10	Currently, the "Stream Impact" section of BUMIS has a tab for "Mitigation" that includes a check box for gate cuts, latitude/longitude input boxes, and a comment area for all other pertinent information. No additional updates are needed to meet the University's recommendation.
9	Apparent data entry errors included in the HMR are not clarified and corrected.	7-4	The errors cited here were from several years ago. The Department has since made a more concerted effort to review the monitoring data at renewal, and, if appropriate, at the time of a stream recovery report evaluation, and, finally, for bond release. As data submission moves further towards electronic reporting, such errors will be easier to flag and correct.
10	The University recommends that PADEP require at least five decimal degrees of precision when coordinates are submitted as latitude and longitude.	12-7	The Department's Oracle-based programs (BUMIS, Samples Information System (SIS) and eFacts) currently require four-decimal degrees when recording all Latitude / Longitude readings. To keep with these established requirements, the Department will continue using four-decimals degrees when recording the Latitude / Longitude readings in BUMIS.
11	The University recommends PADEP consider whether additional accuracy in the determination of undermined stream mileage is warranted. If so, the University recommends that PADEP consider defining a DEM resolution and flow accumulation threshold to identify streams that are not included in "Networked Streams of PA" layer.	12-8	The Department is currently reevaluating the way "total stream mileage undermined" is determined and reported. The goal is to use the most accurate method that is feasible.

SAMPLING/MONITORING			
12	The University recommends inclusion of face position mapping for longwall mining panels as part of the base data for future assessments. Weekly to the Univ to supplement mine maps.	12-2, 12-3	The Department has implemented a longwall tracking spreadsheet with weekly face locations. Mapping these face locations is continuing.
13	Protection of the hydrologic balance is fundamental to the Act 54 legislation. To increase the use and therefore effectiveness of HMR data, the University recommends PADEP 1) examine the water quality parameters required as part of hydrologic monitoring, and 2) add parameters to evaluate potential emerging threats to water quality. Monitoring effectiveness can be enhanced by clarifying water chemistry data use and need. Water quality HMRs are underutilized in assessment of subsidence impacts. Minor adjustments to the required chemical parameters to be measured can provide insight into the impacts of changing landscapes and mitigation practice. Add calcium to detect effect of cement. Add nitrate.	7-3, 7-4, 7-16, 12-4, 13-4	The Department is considering including calcium and nitrate to the sampling parameters and, if justified, will include these parameters in a revised version of the submittal forms.
14	The University recommends that groundwater elevations in piezometers and wells being undermined be monitored at least at frequencies comparable to measurements of surface water flow, and ideally much more frequently. Future HMR groundwater monitoring points be sampled for groundwater elevation at a frequency that is at least consistent with sampling dictated for surface water protection during the pre- and post-mining period (TGD 563-2000-655), if not more frequent.	8-10, 12-6	The sampling frequencies will be reassessed as part of the revisions to the <i>Surface Water Protection – Underground Bituminous Coal Mining Operations</i> technical guidance document (stream protection guidance).
15	Groundwater monitoring is conducted quarterly. This schedule does not capture changes in groundwater occurring during undermining that can be reliably compared with related changes in surface water conditions. To clarify groundwater impacts, there may need to be additional piezometers and/or more frequent sampling of these sites.	13-3, 8-18	The sampling frequencies for groundwater monitoring will be reassessed as part of the revisions to the stream protection guidance.
16	Regarding causes of far field effects: 1) determine the cause of these far field effects; and 2) assess if current policies are sufficiently protective; and 3) decide if policies need to be altered to ensure protection from far field effects. Clarification of the causes of far field effects are necessary to improve predictions of subsidence impacts and advance policies designed to protect citizens' rights and environmental systems.	11-4	The Department investigates all claims of mining-induced damages to determine cause and responsibility, even when damages are located beyond areas predicted to be impacted by traditional subsidence models. When it is determined the operators are at fault for the damages, they are held to the requirements according to Act 54.  The Department is unable to predict where and/or when far-field movements may occur as the mechanisms are not fully understood. Additionally, the Department is not able to conduct research into these specific events other than the initial impact investigation report as doing so would require more resources than the Department currently has.

17	The University recommends PADEP limit the practice of stream augmentation with nearby surface waters. Stream water only to those cases where this practice will allow mine operators to avoid other measures harmful to the hydrological systems. In these cases, the University recommends formal justification of tradeoffs.	11-11, 12-7	The current stream protection guidance does not take into account where the stream augmentation water is obtained. The Department will review this recommendation during the upcoming revision to that document.
18	To encourage data completeness, the University recommends compilation of pre-monitoring data as mining progresses to ensure complete pre-mining baseline data are available.	12-5 7-9	This recommendation by the University is specific to their task of compiling the data. The Department already receives pre-mining data with an application and with hydrologic monitoring reports quarterly. This data is stored in the permit files and can be accessed at any time by the reviewers.
19	The University recommends that a temporal requirement be added to ascertain the quality of water over the course of augmentation. If levels of contaminants are tested as augmentation continues, the likelihood of fish kills and loss of resource use will be reduced.	12-8	The augmented water must be of sufficient quality and quantity to maintain an affected stream's existing and designated stream uses. The Department requires augmentation water supplies to be sampled prior to release into the stream. The field inspectors can ask for additional sampling at their discretion if a problem is suspected. The Department notes only one incident where augmented water caused a fish kill as described. The larger threat to the stream biota is the lack of water entirely.
20	The University recommends that the duration of pre-mining daily monitoring specified in TGD 563-2000-655 be re-evaluated. The observation of stream impacts (heaving and fracturing) up to six weeks prior to undermining indicate the two-week time period may not be adequate to capture the occurrence of pre-mining impacts.	12-9, 9-13	The sampling schedule will be reassessed as part of the revisions to the stream protection guidance.
21	Available data are not comprehensively used. For example, groundwater HMR data are not used to evaluate stream recovery. This has the potential to lead to remedies that do not ultimately preserve the hydrologic balance.	13-4	The Department agrees on the benefits of using Hydrologic Monitoring Report (HMR) data as part of the stream evaluation. This review requirement was included in the recently finalized SOP - Hydrologic Assessment and Completion Reports for Underground Coal Mines SOP (No. BMP-010.)
22	Piezometers that are damaged by subsidence but not replaced create incomplete records that do not provide a contrast between pre- and post-mining conditions. The University recommends that PADEP require replacement of groundwater monitoring equipment if this equipment is destroyed during undermining and enforce this requirement.	8-18, 12-7	In the Department's experience, this situation rarely occurs, but any instances will continue to be reviewed on a case-by-case basis to ensure groundwater monitoring equipment is working as expected.

PROCESS			
23	Evaluation of the completeness of stream monitoring, as specified in technical guidance documents, reveals substantial deviations from the schedule. Current stream monitoring is not gathering flow data that are consistent with TGD recommended monitoring.	7-6 7-9	Holidays, bad weather, and hunting season are examples of situations that result in deviations from the sampling schedule. If there are any deviations, operators are required to explain the missing data in stream recovery evaluations.
24	<p>The University recommends that PADEP require that access to all streams be negotiated and settled prior to undermining. Failure to attain access to streams for collection of premining data or post-mining augmentation results in an unacceptable impact to Waters of the Commonwealth of Pennsylvania. If access for augmentation cannot be obtained prior to mining, then mine operators are not meeting the regulatory requirement to take measures “to ensure the protection of the hydrologic balance and to prevent adverse hydrologic consequences” (25 PA Code § 89.36(a)).</p> <p>The Commonwealth of Pennsylvania has not determined if failure to augment flow loss in streams due to access issues is an unacceptable impact to waters of the Commonwealth. Regardless, the University recommends that PADEP develop policy to minimize this situation.</p>	8-9 12-6	<p>The Department’s regulations (25 Pa. Code 89.52, 89.65, 89.82, 89,142a(h), 93.4a, and 96.3) require operators to conduct underground mining operations in a manner that protects the hydrologic balance, maintains the existing and reasonably foreseeable uses of streams, and minimizes adverse impacts on fish, wildlife and environmental values. The CalDMO requires all operators to include detailed mitigation plans and access agreements prior to the approval of applications. Where subsidence is predicted to increase pool depths by one foot or more, applications that do not include the appropriate access agreements are returned as incomplete.</p> <p>This same criterion cannot, obviously, apply to unanticipated impacts. In those cases, the CalDMO attempts to bring the parties together to resolve the issue. If that cannot be accomplished, then legal advice is sought.</p> <p>Failure to meet the stream use criteria would be an unacceptable impact.</p>
25	The University recommends that field staff (shadows) participate more equally in the release process decisions. The shadows have experience monitoring each stream before, during, and after undermining. The University also recommends more formal documentation of discussions about stream release and improved documentation of the final decision about release.	12-5	CalDMO has created a form for field inspectors (surface subsidence agents) to complete prior to the Stream Recovery Evaluation report review that requires their input regarding the status of stream recovery. Personnel who review the reports are also encouraged to actively involve the field inspectors during their review. Hydrologic Assessment and Completion Reports for Underground Coal Mines SOP (No. BMP-010) was recently finalized to also help address the issues in this comment.
26	The University recommends the PADEP define how to determine if a groundwater aquifer is impacted and the time frame for implementation of the repairs. If this is not possible, then another option is to define methods to identify the influence of groundwater impacts on other impacted hydrologic components (streams, wetlands, etc.) to clarify mitigation efforts in the other components.	12-6	<p>Aquifers in southwestern Pennsylvania can be affected by factors other than mining. In that sense, consideration of an entire aquifer goes beyond the scope of the Department’s mining program whose focus is the effects of mining.</p> <p>However, the Department’s mining program currently assesses the hydrology of the mine site area through the permit information and completes the Cumulative Hydrologic Impact Assessment for Underground Coal Mines and Preparation Plants (5600-FM-BMP0017) (CHIA) to determine the potential for cumulative hydrologic impacts of all anticipated coal mining in the general area of a proposed mining operation. The proposed operation is designed to prevent damage to the hydrologic balance as potential effects to streams, wetlands, and water supplies are assessed prior to permit issuance and are then monitored. Assessment of diminution or pollution of</p>

			groundwater are also addressed through monitoring and response to complaints. Action is taken when damage is discovered primarily because the use of the groundwater is affected. The Department already has processes in place to address these anticipated or unanticipated impacts.
27	The University recommends that the restoration time period of five years be evaluated. This evaluation might focus on streams that have not recovered after five years. If analyses indicate that the recovery period can sometimes exceed five years, the University further recommends re-evaluation of the determination of permanent nonattainment schedule.	12-7	The five-year stream restoration period has been discussed and debated since the conception of the stream protection guidance. Revisions to the stream protection guidance will include further clarification of this issue.
28	The University recommends that stream impact mitigation policies be enforced, and all gate cuts be evaluated for recovery after repair of pooling.	12-10	Emergency gate cuts are rare and must be completed as defined in the Department's stream protection guidance (DEP ID: 653-2000-655) when unplanned flooding hazards pose a significant risk to the public or environment. Subsidence-related pooling predictions for streams are reliable and based on empirical and established models. On occasion, stream pooling results from accumulations of substrates and not ground displacement. All proposed "gate cuts" are evaluated post-mining by DEP biologists and/or engineers.
29	The widespread practice of company purchase of undermined properties has the potential to change the tax base and social fabric of undermined areas. These changes should be evaluated. The University recommends examination of this emerging trend in property transactions, particularly given the broader importance for the Act 54 amendments (e.g., does this subsidence impact management practice "erode the tax base of the affected municipalities"?)	12-4 13-4	The Department understands the University's concerns about this practice, but oversight of buying and selling private parcels, even by a coal company, is not within the authority of the PA DEP Mining Program and is also beyond the scope of Act 54. Many other factors, outside of regulation, are at play. An option to address this issue may be to discuss it with legislators or municipalities affected.
30	The University recommends integration of subsidence impact tracking with broader hydrological management frameworks to make the subsidence impacts and repair more apparent to all citizens of the Commonwealth.	12-4	To bring the impact data from BUMIS to the public in a more timely and transparent manner, BMP is currently developing a process to export, compile, and organize this information for delivery through a public website on an annual basis. At a minimum, an annual release of the data can be made instead of only the 5-year data release as the reports are now. Through GIS tools, that also means providing visual representation of the mining progress. The DEP is partnering with the Citizen's Advisory Council in a workgroup to exchange ideas about these information releases in order to better serve the public.



31	Current hydrological evaluations lack unambiguous means to measure pre- and post-mining flow ranges. Better frameworks for how to use the data result in better data submissions and clarity in the decision-making process.	13-4	The Hydrologic Assessment and Completion Reports for Underground Coal Mines SOP (No. BMP-010) has been developed to detail a comprehensive process of hydrologic review that must occur as part of completion report for all underground mines. The Department is encouraging the submission of the data in an electronic format that allows personnel to review, compare, and graph the pre- and post-mining data expediently with fewer errors.
32	One of the gate cuts performed during the 5th assessment was an emergency gate cut (Mudlick Creek over Bailey Mine in September 2013) and monitoring was not required for release. It is not clear why this emergency gate cut was exempted from monitoring, and the University recommends that all gate cuts be monitored beginning before the project starts and continue to periods following completion.	9-19	<p>During the 4th Act54 reporting period (2008-2013), an emergency gate cut was performed on the 16I panel (Bailey), near the confluence of Mudlick Fork and Hewitt Run, due to the potential flooding of several houses and a church. Pooling was not predicted, and because of the potential damage to several structure, the gate was cut. Although all gate cuts are monitored post-mitigation, unfortunately, the review for this was missed by staff at the time.</p> <p>Although this has been the only incident since the stream protection guidance has been put in place and incidents like this are not expected to be a regular occurrence, the Department will examine the procedure for emergency gate cuts to ensure they are monitored.</p>
33	There is no documentation of formal evaluation of water quality monitoring during renewals of longwall permits included in the permit files.	7-4	Data sets should be regularly reviewed by the inspectors who will flag a problem to discuss with technical staff. The Department is in the process of updating the permit renewal procedure and checklist, which will include evaluation of the monitoring data.

STREAM RECOVERY EVALUATIONS			
34	<p>Comparison of ranges is problematic for statistical reasons. New comparison of flow range methods require[s] more attention to data distributions to ensure statistical assumptions are met. Plotting log transformed flows in conjunction with the normal flow plots clarifies low flow ranges and distributions. A paired flow and log transformed flow time series pair improves and clarifies flow range evaluation. Two distribution comparisons can allow visual screening for potential biases: 1) the distribution of flows; and 2) the distribution of flow measurements across the year. The other potential bias is an oversampling of a characteristically wet or dry season. If late summer/early fall is over sampled, then the range of flows will be artificially low. If late winter/early spring is over sampled, then the range of flows will be artificially high. Further, as base flow evaluation continues to evolve (Hittle and Risser, 2019; Silvis et al, 2019), identification of these biases will remain important to accurate comparisons of flow. The University recommends visualization of log transformed flows in conjunction with the normal flow plots to clarify low flow ranges and distributions. The University recommends two distribution comparisons to assess potential biases: 1) the distribution of flows; and 2) the distribution of flow measurements across the year.</p>	7-9, 7-10, 7-12, 7-13, 7-14, 7-16, 12-5	<p>The Department agrees that potential biasing of the flow ranges as a result of data collection can be a problem. However, it is not clear if the issue is significant enough to warrant implementation of statistical processes if a simpler screening can be employed. A discussion of sampling will be addressed in the revisions to the stream protection guidance document.</p>
35	<p>Development of simple QA checks that can be specified as part of SRE reporting will facilitate more efficient evaluation of stream flow. At present, determination of recovery based on incomplete data sets occurs too often, and when it occurs the circumstances are often not documented.</p>	7-16	<p>The Department is reviewing the current information submitted with the Stream Recovery Evaluation reports in an effort to develop a SOP for completing and reviewing Stream Recovery Evaluation reports. As recommended, quality checks will be implemented through this process.</p>
36	<p>The University recommends that a different source of data be used to compare the TBS of streams before and after mining. This would require that the professionals or institutions conducting the assessment be given access to pre- and post-mining data for all monitored streams or that the professionals or institutions conducting the assessment be contracted to conduct post-mining surveys themselves, as in prior assessment periods. In addition, with each SRE report, PADEP could require operators to submit TBS data as well as the raw data used to calculate the TBS.</p>	12-9	<p>As part of the stream protection guidance revision, the current biological sampling methods will be replaced with the Department's Bureau of Clean Water's Index of Biotic Integrity for Benthic Macroinvertebrate Communities in Pennsylvania's Wadeable, Freestone, Riffle-Run Streams (2015). This will give operators more flexibility in their sampling procedures and allow them to use more appropriate collection that will be more useful in evaluating stream recoveries through fair comparisons of pre- and post-mining biological data.</p> <p>The recommendation of including the impacted stream's Total Biological Scores as well as the raw biological data will aid the Department's biologist review of the Stream Recovery Evaluation report in determining the biological recovery of the stream and will be included in the proposed Stream Recovery Evaluation report SOP.</p>

37	The University recommends that SRE reports be tracked in BUMIS, including status from submission to final resolution. This will build upon the progress made in the addition of stream impacts that occurred during this assessment.	12-9	BUMIS is designed to track impacts. The Stream Recovery Evaluation report is submitted to the Department when the operator believes the stream is recovered to pre-mining conditions and requests release from further stream mitigation. The operator may sample the stream several times over several years but will only submit a Final Stream Recovery Evaluation report for review when they believe the stream has recovered. The Department will explore adding a "completed review" date to BUMIS.
38	The University recommends requiring that mine operators survey headwater streams for fish before undermining occurs and that PADEP and mine operators coordinate with Pennsylvania Fish and Boat Commission to inventory stream fish, fauna and water quality as part of the Unassessed Waters Initiative, or other quantitative surveys, before and after such streams are undermined.	12-8	Operators follow the stream protection guidance document (DEP ID: 569-2000-655) and the current regulations regarding stream surveys prior to undermining. As the Department's mining program does not have the authority or resources to assist another agency in their initiatives, this comment is beyond the scope of the Act 54 report.
39	Subsidence agent input appeared to be less valued relative to hydrological and biological criteria.	7-16	Please see the response to Comment #25.

OTHER			
40	The mechanics of why so many unexpected reported effects occurred in Maple Creek is not known. Further investigations are recommended. Trend in subsidence impacts over inactive mines, if not examined, has the potential to impact property owners long after operator liability is expected to end. Further investigations of the mechanisms and factors driving subsidence impacts in inactive mines are recommended. The subsidence impacts in inactive mines during this assessment period creates the potential for extended responsibilities for mine operators that are not expected, both through time and across space. Processes driving these impacts can be clarified.	4-19, 11-4, 12-3, 13-4	<p>The Department investigates all claims of mining-induced damages in the context of either active mining-related subsidence or historic mining activity. However, the Maple Creek Mine is sealed and inaccessible. Therefore, direct examination of the mine workings is not possible. A systematic evaluation to determine the cause of subsidence occurring at Maple Creek would involve an invasive and expensive geotechnical study that would have to be coordinated outside of the normal scope of the CalDMO sphere of work.</p> <p>For mining conducted on/after August 21, 1994 (the implementation of Act 54 provisions), mine operators remain liable for mining-induced damages regardless of when the damages occur, unless the operator has executed a liability release for the structure. Homeowners have the option to apply for low-cost Mine Subsidence Insurance through the Commonwealth as a secondary coverage.</p>

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4 February 2016

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**In re: Comments on "Assessment of the Effects of Subsidence (Act 54) Report 2008-2013", an Internal Workgroup Review of the 4th Act 54 Report**

Dear CAC Members:

This letter provides comments on the above-referenced assessment dated 16 November 2015. That report was prepared by an internal workgroup in the Department and recently was shared with the Citizens Advisory Council, which posted it on its website.

These comments have been prepared by me as a public service and not on behalf of any client or interest group. My comments are based on my more than 30 years as a private-sector environmental consultant who has been closely involved with the Department's environmental and mining regulatory programs and policies on behalf of permit applicants, appellants, environmental protection groups, and the Department itself (see list of selected reports and comment letters in Attachment 1). In particular, I have read and reviewed each of the Act 54 reports prepared to date.

In accordance with Section 18.1 of Act 54, the Department is responsible for preparing a report every five years to determine the effects of underground coal mining subsidence on surface structures and features and on water resources. Although the Department utilized the services of the University of Pittsburgh (Pitt) to prepare the \$600,000 *4th Act 54 Report* on its behalf, at the end of the day it is the Department's report and it must represent the Department's views.

The subject Workgroup assessment takes issue with, and even disputes in part, some of the findings and recommendations of the Department's *4th Act 54 Report*. Yet the Department and University researchers held regular meetings throughout the course of the preparation of the *4th Act 54 Report*<sup>1</sup>. Thus, there was ample opportunity to correct misperceptions about the regulatory process and the operations of the Mining Program. A near-final draft of its product was provided to the Department by the University in May 2014, more than 6 months before it was released to the public. The

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<sup>1</sup> Following the public release of the *4th Act 54 Report*, Schmid & Company submitted a Right to Know Law (RTKL) request to the Department seeking a copy of all records and data associated with the preparation and compilation of the *4th Act 54 Report*. We received some, but not all, of the records we had requested.

issues and clarifications raised in the subject Workgroup assessment are matters that should have been addressed by the Department and incorporated into the final document, not matters to be brought up one year later. This suggests that the *4th Act 54 Report* may not yet be finished.

The Workgroup assessment repeats or summarizes many of the recommendations already provided in the *Act 54 Report*, along with some comments raised by members of the public. Workgroup "recommendations" are vague and weakly worded, and they lack any timeframe commitments for follow-through. The Workgroup's stated objective is to eventually develop and implement some ill-defined "work plan", to be implemented by the Department and then assessed in the next Act 54 Report. However, since we already are halfway through the 5th Act 54 assessment period, it is virtually impossible that any meaningful evaluation of an as-written work plan could be completed for the 5th Act 54 Assessment.

My comments below generally follow the order in which matters are raised in the Workgroup assessment.

## **Pg 2 - Key recommendations**

The list of "key recommendations" is missing at least one very important item that was mentioned in numerous comments on the *4th Act 54 Report*:

- The Department and/or the mining industry need to develop a model to accurately predict stream *flow loss* impacts (similar to the model being used to predict stream *pooling* impacts)

For many years Chapter 89.35 has stated that, for every underground mining operation:

*"the operation plan shall include a prediction of the probable hydrological consequences of the proposed underground mining activities upon the quantity and quality of groundwater and surface water within the proposed permit [area], adjacent [areas] and general areas under seasonal flow conditions..."*

Despite this clear regulatory requirement, such predictions are not being done for the longwall mines that are destroying water resources in the Commonwealth.

## **Pg 3 - Objective**

The objective of this Workgroup assessment is stated thus:

**This [Workgroup] report will be reviewed by DEP executive management to consider and provide guidance on development and implementation of a work plan. The next [5-year] report will include an assessment on the extent to which DEP followed through on the work plan.**

That is simply unacceptable. A Work Plan should have been developed already (the *4th Act 54 Report* was released more than a year ago), but since it was not, it must be developed ASAP. What's needed are specific timeframes set out for accomplishing specific tasks. Plus, there needs to be an active, ongoing evaluation of progress --- the CAC should ask the Department to report back on its progress with every specific Work Plan task every 2 or 3 months (at minimum) and update the Work Plan accordingly.

#### **Pg 7 - Report issues**

The Workgroup identified 95 issues which it grouped into 7 general themes, and makes 45 recommendations. The 95 issues are presented in a quasi-comment/response format, but clearly it does not constitute a typical comment/response document. Instead, the Workgroup **combined and summarized** *some* of the comments and recommendations into its own list of "issues", and **ignored** others, including some from the CAC. A Comment/Response document such as the Department typically prepares for proposed regulatory changes actually would have been much more useful.

#### **Pg 8 - Wetlands**

The Workgroup states that according to the *4th Act 54 Report* "*DEP allows use of a grouping method for small wetlands*". It fails to note that the *4th Act 54 Report* characterized that method as "*seemingly random*". The Workgroup also recommends the use of multiple delineations of wetlands during the initial (presumably, premining) assessment in order to account for possible seasonal changes.

Both of those statements reflect an apparent ignorance of wetland delineation methods and processes. Neither grouping of wetlands nor multiple delineations is necessary or appropriate. The *4th Act 54 Report* is correct, unfortunately, in stating that "*The analysis and reporting on underground mining effects on wetlands is still in its infancy*." This is a disgraceful situation some 20+ years after Act 54 was enacted, and reflects poorly on the low priority that the Mining Program places on wetland protection.

The Workgroup response to Issue #9 (page 24) in part reads:

**"The DEP is willing to consider input that would improve the [wetland] delineation and evaluation process."**

The Department must go beyond "considering" this matter. As a private consulting ecologist, I have been involved in wetland assessments and delineations for 3+ decades, and for many years now I have tried to offer the Department practical input on how to better protect wetlands in the context of underground coal mining. Accurate wetland delineation simply requires competent wetland delineators and common sense. Wetland delineations can be done accurately any time of year as

long as the ground is not covered with snow or ice. Competent wetland delineators take seasonal differences in wetness into account. The Corps of Engineers has an established, straightforward, no-fee process/procedure for checking the accuracy of wetland delineations for federal and State purposes. That process (known as a "Jurisdictional Determination", or JD) is widely used in conjunction with other types of development projects throughout Pennsylvania. There is no excuse for not taking advantage of the Corps JD process in conjunction with mining projects, especially since Department personnel lack the time and expertise to undertake formal review of wetland delineations.

### **Pg 11 - Use of best available science**

The Workgroup states:

**"The streams policy should be reviewed to assure it is up-to-date regarding the best science available..."**

This is an excellent suggestion. As pointed out in comments I prepared on behalf of the Citizens Coal Council<sup>2</sup>, all models and assumptions (the Peng model for pooling, the 35-degree angle of draw/RPZ, the 3 year allowance to determine whether a stream can recover naturally or must be repaired, whether longwall damage is predictable, whether planned longwall subsidence damage is preferable to unplanned subsidence damage, whether longwall damage is/can be controlled, etc.) should be reviewed, updated, and tested to ascertain if they are scientifically valid in light of current/modern longwall mining practices and the ever-increasing damage to water resources that is being documented in the coalfields. [See also RPZ discussion below.]

### **Pgs 8 and 12 - BUMIS**

On page 12, the Workgroup *clarifies* that the main GIS mining database known as BUMIS only contains information about *impacted* features, not about *all features* at risk from undermining. This apparently was a significant misunderstanding on Pitt's part, not only during this most recent assessment but during the 3rd Act 54 assessment which the University of Pittsburgh also assisted in preparing. Because the information in BUMIS is crucial to the Act 54 reviews, this fact is something the Department should have straightened out long before now. Why was Pitt unclear on that fundamental fact --- shouldn't the Department have become aware of this misunderstanding as it reviewed drafts of its Report?

This limitation in BUMIS must be changed. There is almost universal agreement that BUMIS needs to be improved, upgraded, or replaced. Clearly the Department should

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<sup>2</sup> Schmid and Company, Inc. 2015. Undermining the public trust: a review and analysis of PADEP's fourth Act 54 five-year assessment report. (Prepared for Citizens Coal Council.) Media PA. 65 p.  
[http://schmidco.com/Mar\\_2015\\_Undermining\\_the\\_Public\\_Trust.pdf](http://schmidco.com/Mar_2015_Undermining_the_Public_Trust.pdf)

be tracking all features at risk. The Workgroup says that to replace BUMIS "*would be a major undertaking involving years of planning and considerable cost*". But Pitt actually did create a new GIS database during preparation of the *3rd Act 54 Report*. Why was that GIS database not subsequently used by the Department or even by the University during the 4th Act 54 assessment? For some reason Pitt needed to create an entirely new GIS system during the 4th Act 54 assessment period. According to the Report (page II-2):

**"A major part of the Act 54 reporting work involved the construction of the [new] Act54GIS. Much effort was spent collecting available data, transforming and combining the data into user-friendly products for analysis, and updating the database as new spatial data became available."**

Two separate Act 54 GIS databases now have been created by Pitt at great expense to the Commonwealth, yet the Workgroup assessment never mentions them. Why can't the ACT54GIS database be used instead of, or as a way to improve upon or update, BUMIS? Why is the Act54GIS database not available to the public?<sup>3</sup>

### **Pg 13 - Stream impacts**

The Workgroup states:

**"We do not have the true value of affected stream length as a proportion of the total stream length."**

- Why not? The length of an affected stream is an important fact if the Department hopes to understand what is happening to streams, where, and under what conditions, and to properly evaluate if the damaged stream has been fully restored.

The Workgroup states:

**"The DEP can provide a more specific answer to the impact of underground mining on streams in the future."**

One certainly hopes so. But *when* exactly, and why should we have to wait any longer? The Department has produced four Act 54 Reports now, and yet the Department still has no clear understanding of the extent of damage to streams and other natural features like wetlands and groundwater. The Department needs to provide a specific action item and timetable for doing this. Longwall mine permittees are compiling at great expense detailed information on streamflow for every undermined stream. The Department should require that all stream monitoring data collected by mine operators in accordance with their permits be provided in some meaningful format to the Department.

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<sup>3</sup> In our Right To Know Law request to the Department (see footnote 1) we specifically requested a copy of the ACT54GIS database, or at least access to it. We did not receive it. Instead, we received an Excel file containing a "data dump" from BUMIS as of a specific date in time.



## Pg 14 - Irreparably damaged streams

The Workgroup states:

**"Considering the huge extent of underground mining in Pennsylvania at this time, irreparably damaged streams are the exception, with just five cases demonstrated in this Report."**

This statement is hopelessly and cynically misleading.

First, the *4th Act 54 Report* (see Table VIII-3) documented that there were 6 cases (not 5) of streams determined by the Department to have been irreparably damaged during the 4th 5-year period.

Second, those 6 determinations were made during December 2012, almost 5 years exactly after TGD 563-2000-655 became fully effective (Oct. 2007). That timing is important because that TGD, for the first time, had set a timetable of 5 years for how long operators could try everything "technologically and economically feasible" before a stream would be declared irreparably damaged. So in effect, those 6 streams potentially are just the leading edge of a wave of similar outcomes which existing monitoring information will allow to be assessed in the future.

Third, information in the *4th Act 54 Report* (details below) point to many more stream damages than just those six:

- Table VIII-1 lists the current status of the 55 stream segments where unpredicted impacts occurred during the 3<sup>rd</sup> Assessment period (all by longwall mining).

- Of the original 55, only 3 streams either had recovered on their own (2) or were repaired (1) as of the end of the 4<sup>th</sup> Assessment period.

- The final status of 35 cases from the 3<sup>rd</sup> Assessment period is listed simply as "resolved", which does **not** mean the stream damage was repaired or restored. Those damage cases typically were *resolved* on the basis of some written agreement between the landowner and the mine operator (which likely is subject to nondisclosure restrictions and probably involved no actual stream restoration at all). Indeed, at least 1 of the irreparably-damaged streams was classified as "resolved" because its status was "final" --- nothing can fix it, even though some mitigation elsewhere still was to be required for its loss.

- As a proxy for stream impacts during the 4th Assessment period, Pitt reported the number and types of ongoing restoration efforts:

- 95 streams had augmentation installed (for flow loss impacts), 74 of them were active

- 57 streams received grouting (for flow loss impacts),

- 28 streams received gate cuts (for pooling impacts)

- 3 streams had liners installed (a last-ditch effort for a stream damaged by flow loss)

- Most streams undermined during the 4th Act 54 assessment period required some type of restoration efforts (even if not for its entire length).

Fourth, **all** stream damages reported in the 3<sup>rd</sup> and 4<sup>th</sup> Assessment reports were associated with longwall mining --- none with room-and-pillar or retreat mining. For the

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Workgroup to say that 5 or 6 irreparably-damaged streams is a small proportion considering all of the "*underground mining in Pennsylvania*" is to deliberately misrepresent the actual problem --- which is that all of the stream damages have been due to a handful of longwall mines in two counties in southwestern Pennsylvania.

#### **Pg 15 - Longwall mining**

The Workgroup states:

**"The citizens have asserted that the process of longwall mining causes material damage. The existing laws and regulations allow for full extraction (including longwall mining). The DEP has no legal means to prohibit it ..."**

First, the fact that recorded stream damages are almost exclusively associated with subsidence from longwall mines (and not with the much more numerous room-and-pillar mines) is not based solely on citizens' assertions --- it is based on the data presented in all four of the Department's Act 54 Reports prepared to date.

Second, there is no need for the Department to *prohibit* longwall mining or any specific mining process. Yes, the existing laws allow for full extraction mining, but there also are existing laws and regulations in place to protect streams and their uses. Act 54 clearly states that it does not supersede the Clean Streams Law and other environmental protection laws, and those laws do not allow for irreparable stream damages. Such damage to streams also is contrary to Article 1, Section 27 of the Pennsylvania Constitution. What needs to be prevented or prohibited, however, is not the mining process, but the damage. Mine operators should be allowed to use any process they want to extract as much coal as possible as long as it is done in a way that does not damage streams.

The Workgroup states:

**"Longwall mining must be planned in such a way so as to prevent subsidence damage to aquifers and perennial streams."**

That *sounds* good, but unfortunately it is easier said than done, and because of that it is **not happening**. Instead, stream damages continue to occur, and in recent years some have been found to be irreparable.

One widely expressed misperception is that longwall mining involves "planned subsidence" which somehow is better or less damaging than "unplanned subsidence". Twenty years of Department-compiled data demonstrates that the premeditated subsidence of modern longwall mines is very damaging indeed. On the other hand, the Department's Act 54 reports show that properly designed room-and-pillar mines only rarely are associated with either subsidence or stream damage. The ever-increasing balance in the Department's Coal and Clay Mine Subsidence Insurance Fund (currently about \$100 million) is a testament to the paucity of claims being paid out for subsidence damage from abandoned underground R&P coal mines.

Changes must be made (either to the TGD, or preferably to the regulations, or even to the law itself) to ensure that subsidence damage to aquifers and to *all* streams (not just perennial ones) is prevented, and that when it does occur, the mine operator is held responsible.

The Workgroup states:

PADEP can **"deny a permit .... if the DEP determines that the activity will cause severe, irreparable damage to the stream."**

Again, that *sounds* good, and theoretically it may be true. Unfortunately, there is no accurate model or method being used to predict when or where there will be severe, irreparable damage to a stream, and so permits are routinely issued. And then when severe, irreparable, unpredicted damage **does** occur to a stream, there is no consequence for the mine operator because there was no way to predict it.

The Department needs either to

- require accurate predictions of where severe irreparable stream damage will occur, or
- stop issuing permits to mine operators who caused unpredicted stream damage, at least until the stream(s) have been successfully restored to their premining flow and biological condition.

#### **Pg 17 - Rebuttable Presumption Zone (RPZ)**

The Workgroup states:

**"While there are anomalies that can occur outside these boundaries, the workgroup considers the current guidelines as reasonable and scientifically valid."**

The *4th Act 54 Report* found that 25% of the impacted water supplies documented as having been damaged by mining were located outside the 35-degree RPZ --- one in four represents much more than "anomalies". Furthermore, impacted water supplies were found to be located as far as 85 degrees outside, more than double the RPZ. The Workgroup provides no support for its speculative "consideration" which flies in the face of the data presented in the Department's Act 54 reports. Whether or not the 35-degree RPZ might have been "*reasonable and scientifically valid*" when it first was proposed 25 or 30 years ago, there clearly is a need to verify whether it remains so today under current longwall mining technology which is significantly larger in scale than it was then.

## **Pg 20 - Data to assess stream impacts**

Workgroup recommendation #21 is:

**"Determine what data is needed to best assess streams potentially affected by mining. Produce a public explanation of the determination. Does frequency and reporting of stream flow data need to be revised?"**

This is the sort of vague recommendation that appears to be doing something in order to placate the public, but really is not. There is no timeline given. The most likely result might be a public explanation of data needed to assess stream impacts, but how or whether that might be translated into meaningful action is uncertain. The question (about whether the frequency and reporting of stream flow data needs to be revised) already was answered by the researchers from the University of Pittsburgh hired by the Department (their answer was "yes").

What really is needed, as a top priority, is a model to predict where and when streams are most likely to experience flow loss. Additionally, there need to be significant consequences to operators that cause unpredicted impacts. So far, the significant consequences of longwall subsidence have been borne by surface landowners, the public, and the environment --- but not by the longwall operators.

## **Pg 20 - Hillslope hydrology**

Workgroup recommendation #22 is:

**"Assess if additional info is needed in hillslope areas."**

The researchers from the University of Pittsburgh already made it quite clear that such information is needed. The *4th Act 54 Report* (page X-6) states:

***"Hydrologic changes occurring in hillslopes cannot be characterized as data simply do not exist to evaluate changes in hillslope hydrology. The University recommends that additional monitoring of changes to hillslope moisture status be added to the technical guidance..."***

Further dithering by the Department is unnecessary. Workgroup recommendation #3 (page 19) accepts without question Pitt's suggestion to shorten the time period when macroinvertebrate stream assessments should be conducted (contrary to the science-based procedure now in use, which was developed by the Department's and outside experts), so why does the Workgroup seem to question the need for additional information in hillslope areas? The real question here should be not "if" additional monitoring is needed, but how quickly can the Department implement it without further delay.

## **Pg 21 - TGD on stream protection**

Workgroup recommendation #38 states:

**"Review the streams policy (TGD 563-2000-655) to assess changes that need to be made."**

Even if they are excellent, any changes in policy or technical guidance will take time to implement and make it difficult to directly compare one Act 54 assessment period with another. Which is not to suggest that improvements to the TGD are not sorely needed or should not be made. The point is that the Department must not misrepresent possible new improvements in the TGD as a "silver bullet". The current TGD was adopted in 2005, following more than 3 years of public review and comment on several draft versions. There then were an additional 2 years allowed (until 2007) before all of its provisions became fully effective. During that entire time the Department repeatedly pointed to the changes being made to the TGD as "proof" that it was being responsive to those of us calling for greater stream protection. Yet the *4th Act 54 Report*, released more than 7 years after the TGD became fully effective, pointed out that the TGD's effectiveness still could not be accurately assessed because neither the mine operators nor the Department were faithfully or consistently applying its directives. No matter how good or well-intentioned they may be, new policies are useless if the Department cannot or will not implement them.

Similarly, the Department must not place too much hope or expectation on a stream study it is jointly funding with the US Geological Survey (USGS). That study ("Characterizing Natural Streamflow in Small Ungaged Watersheds") is not meant to provide any direct evaluation of the effects of underground coal mining on stream flow. Rather, its main objective is to provide reference/background information regarding the nature and variability of natural stream flow in unmined watersheds. Furthermore, that study is not scheduled to be completed until September 2017, so it likely will be some years *after* that before it will be of any practical use to the Department.

**These long-term efforts are laudable, but should not be confused with, or seen as a substitute for, specific short-term measures and improvements that have been identified by CAC and others and must be implemented as soon as possible.**

## **Pg 22 - Follow up needed in future report**

Workgroup recommendation #39 states:

**"Follow up on Brush Run (after the study period)."**

This was a recommendation in the *4th Act 54 Report* because attempted restoration of Brush Run already had been underway for 7.3 years without success. The same recommendation should be made for every damaged stream that had not been fully restored to premining conditions by the end of the 4th Act 54 assessment period.

### **Pg 36 - Prediction of stream impacts**

In partial response to Issue #69 the Workgroup states:

**"DEP focuses on prediction and prevention of problems.... According to CDMO, almost all of the problem stream cases were unanticipated effects. 100% accuracy of prediction is not a reasonable expectation."**

While perfection indeed may not be attainable, why not at least strive for 100% accuracy? One of the fundamental flaws of Act 54 is that it eliminated the 1966 Mining Law *prohibition* on surface damage and *allowed* damages to occur with the expectation that damages would be fixed. When you lower the standards, you get poorer results. The four 5-year Act 54 Reports demonstrate that all damages are **not** being fixed --- far from it. Indeed, damages are *increasing* in both numbers and severity, many structure and water supply damages are taking years to reach any resolution, many natural resource damages are not being adequately tracked, and some natural resource damages have been determined by the Department to be irreparable.

There is no incentive for any accurate prediction of stream flow loss. Certainly by now the mine operators, if not the Department, after many years of collecting and monitoring stream flows in real time as undermining occurs (monitoring data that the Department ignores because it does not require the operators to submit it), have a reasonably good understanding of which streams and under what conditions they are likely to experience flow loss and be especially difficult to restore. As noted above in my first comment (page 2), prediction of hydrologic consequences is not just a good idea --- it is a long-standing regulatory *requirement* that is not being applied.

### **Pg 39 - Pooling**

The Workgroup states:

**"Pooling is an easy-to-correct situation in most cases and is not a major issue. Unexpected pooling occurs only a few times a year. Such cases are handled as they are documented."**

It is plausible that it would be easier to correct pooling impacts (where the water still is present, but is trapped behind an unsubsidized gate) than it is to correct flow loss impacts (where the hydrology of not only the stream but also its surface and groundwater inputs have been disrupted). The *4th Act 54 Report* noted that it takes on average 682 days (1.9 years) for mine operators to begin restoration of streams impacted by pooling. It did not calculate the average length of time to conduct the pooling restoration work itself or assess its effectiveness in restoring biological conditions afterwards. For a formerly free-flowing stream to experience pooling for even two years, however, should be viewed by the Department as a significant impact rather than as "not a major issue".

This Workgroup assessment is typical of the Department's weak response following each of the Act 54 Reports to date. The pattern is tiresomely predictable: acknowledge that there may be some problems, give vague assurances that things are being done to correct them, promise that the next five-year Report will show improvements, and hope that the public has been placated enough to turn its attention to non-mining matters. Perhaps the real intention of the Department is to further delay any meaningful action until the remaining coal has been mined out --- which this *4th Act 54 Report* noted will occur in only a few more decades.

Thank you for the opportunity to provide these comments.

I would be willing to meet with members of the CAC and/or the Department to discuss these comments in greater detail or to help develop ideas for specific practical changes that could be made to improve environmental protection in the context of underground mining.

Yours truly,

A handwritten signature in black ink that reads "Stephen P. Kunz". The signature is written in a cursive style with a large, prominent "K" and "S".

Stephen P. Kunz  
Senior Ecologist

Attachment

cc: PADEP Bureau of Mining Programs



# Transmittal of comments on Act 54 updates from BUMIS to the Department, 13 May 2021

From: Aimee Erickson <[aimee@citizenscoalcouncil.org](mailto:aimee@citizenscoalcouncil.org)>  
Date: Thursday, May 13, 2021 at 5:04 PM  
To: "Genseal, Roland" <[rgense@pa.gov](mailto:rgense@pa.gov)>  
Subject: June 8 documents and suggested agenda

Hello Roland,

For the upcoming June 8<sup>th</sup> meeting we would like to discuss BUMIS and PADEP annual updates. Please see the June meeting discussion and the commentary documents attached.

We took 17 of the questions we sent to the PADEP and grouped them the best we could by subject (issue) matter. In the June meeting document we listed by issue what we would like to discuss in the upcoming monthly meetings. Before each meeting we will send the pertinent questions and the PADEP's responses related to the topic of discussion for that month. This might help the PADEP determine who should be on the call for that month.

Hopefully, this makes sense, if not please let me know.

Thanks!

**Aimee Erickson**  
Executive Director  
Citizens Coal Council  
139 Front Street  
Washington, PA, 15301  
C: 724.479.3982  


**Our Purpose:** The Citizens Coal Council is a national network that advocates for full enforcement of the federal Surface Mining Control and Reclamation Act (SMCRA) and its delegated state programs.

**Our Mission:** To inform, empower and work for and with communities affected by mining, processing and use of coal.

2 Attachments - Scanned by Gmail



## **Comments on *Act 54 Yearly Data Updates***

As Posted on the  
Pennsylvania Department of Environmental Protection Web  
Page

### **Prepared for:**

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Washington PA 15301

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12 May 2021

**Act 54 Yearly Data** (annual updates, beginning with 2018, now are being provided by PADEP Mining Program; they are found at the following website:

<https://www.dep.pa.gov/Business/Land/Mining/BureauofMiningPrograms/Act-54-Yearly-Data/Pages/default.aspx>

Excerpts from Act 54 Yearly Data opening webpage:

*The Department compiles, on an ongoing basis, claims of effects from bituminous underground mining relating to land damage/subsidence, methane intrusion, structure damage, utility damage, water supply contamination and water loss, and stream impairments. With the availability of tools and applications that allow for **real time data compiling and public release**, the Department is publishing the data from the Bituminous Underground Mining Information System (BUMIS) **in an understandable format each year** beginning with the data from 2018. [bold added]*

We are pleased to learn that data extraction into tables is now more efficient and no longer requires manual recompilation from a data “dump” onto a spreadsheet. Apparently, the Department is making these data available to the public because they are more current (“real time”) than the 5-year assessments, and it believes that the format and data it provides annually will be useful to the public (“understandable”). That is far from accurate. We cannot understand these data tables. Furthermore, these annual updates are not comparable with the data in the last 25 years’ Act 54 Reports.

The Department appears not to have looked at the substance of what it has posted online. With some careful editing the current postings could begin to convey some useful information. However, we hope that the Department will go beyond simply correcting typos and adding necessary labels, and add some interpretative and basic analytical information as well.

The opening webpage begins with some general questions that the Department attempts to answer.

**Why is the Department changing the process of data release?**

*The Department recognized several disadvantages to the production of reports every five years.*

- *Because of the process to compose, review and finalize a report, the data contained in a report are at least a year old. A significant incident that occurred near the end of one report would not have a resolution until the next report was released five years later, which means the report information can feel outdated even upon issuance. That is not convincing. Resolution of an incident does not depend on when in the period it occurs. Reporting on the resolution may, however, and it is important for the Department to keep close tabs on how long it takes from reported damage to final resolution, as well as the type of resolution (repair or not). None of these new tables does that.*

- *Using outside contractors to collate the data and compose a report takes excessive time and funds. The Department can more quickly supply the raw data directly to the public. Who decided the cost was “excessive”, and compared to what? It should be noted that the federal OSMRE pays for half of the cost of the 5-Year Act 54 Reports. The Department’s contractors have said repeatedly that most of their work consists of extracting data from files of the Department or of mine operators into a usable GIS system, which work apparently must be done over again each five years. Any discussion of “costs” should include the costs to coalfield residents, the public, and the environment that are being **externalized** by mine operators and PADEP. Of what value are quickly-provided raw data when they are haphazard, unexplained, misleading, and incomplete as at present?*

- *The recent reports contained significantly more background information than the law requires of the reports (is this a legal interpretation? – the Department always should have the discretion to add any background needed in order to make information more useful and informative, both to the public and to decisionmakers) resulting in repetition and a massive volume that is daunting to read (first, let the public decide whether it is “daunting” to them; second, understanding the data would be less daunting if they were complete and not contradictory; third, the reports continue to be thin on analysis and recommendations for policymakers). *Reports remain available for reference* (only the ones already prepared, or will new 5-year reports also be produced in addition to the annual updates?), *but the Department will attempt to provide useful, more up-to-date data based on feedback we receive. (We provide herewith considerable feedback for your consideration.)**

Another of the general questions on the opening webpage seems simple enough:

## How many underground mines are operating in Pennsylvania?

When you click on that link to expand it, the answer appears:

There are currently approximately 80 underground mines (longwall and room and pillar mines) that are in various stages of activity or reclamation in Pennsylvania. This is a dynamic number that changes each year.

[List of existing mines](#) updated December 2020

This might lead one to believe that there are 80 underground mines operating as of December 2020. But that is not correct. Indeed, there *are* 80 mines in the linked Excel list as of December 2020, but only 41 of them are listed as “Active” (a decrease from 49 active mines during the 5<sup>th</sup> Period). The other status categories include “Approved Cessation” (11), “Not Started” (3), “Stage 2 Approved” (7), “Stage 2 Eligible” (4), and “Stage 1/Regraded” (14). These appear to represent various types of inactive mines, but none of those categories is defined. Perhaps those categories are meaningful to Department staff, but they are not self-explanatory for others. Why include mines in “reclamation” in this list when reclamation is not part of Act 54? At the very least, the date that production ceased should be noted for each inactive mine listed.

If one focuses only on the 41 underground mines listed as “Active”, one notices that under the column heading “OPER\_CHAR\_DESC” (not described anywhere), the mines are listed as being either (1) “Long Wall Mining” or (2) “Room and Pillar Mining”. None is described as “Pillar Recovery”<sup>9</sup>. Six of the Room and Pillar descriptions are highlighted in yellow on the Excel spreadsheet. What distinguishes the highlighted from the not-highlighted Room and Pillar mines is not defined either. Clearly, these data are not comparable to prior Act 54 report statistics. Comparability of data and analyses from one 5-year Report to another has not been a priority for the Department. It is unfortunate that these annual updates are not comparable to past reports.

The 5<sup>th</sup> Act 54 Report listed 49 mines that had been active at some point during the 5<sup>th</sup> five-year Period. Among them were 5 Pillar Recovery mines, but there are no mines

<sup>9</sup> The last four Act 54 reports provided details about 3 separate methods of mining, including Pillar Recovery (sometimes called pillar removal, pillar extraction, or retreat mining).

labeled “Pillar Recovery” among the 80 listed as “existing” in December 2020. Have all the Pillar Recovery mines closed? Apparently, the highlighting on 6 of the listed R&P mines is not meant to designate Pillar Recovery mines (only one of the 6 -- Prime #1 -- was identified as a Pillar Recovery mine in the 5<sup>th</sup> Act 54 Report, but that appears to be only a coincidence). Four of the five previous Act 54 Reports all separately assessed impacts and resolutions from Pillar Recovery mines, but no such evaluation is possible with these newer data. No explanatory discussion is included.

One of the “Long Wall Mining” mines listed as “Active” is called “**Ohio County Mine**”. It is listed as being operated by “The Ohio County Coal Company” and is said to be located in West Finley Township in Washington County. The column for “permitted underground acres” for this mine is blank. No mine (or mine operator) by this name was discussed in the 5<sup>th</sup> Act 54 Report (or any previous Act 54 Report). The GIS mining files available from PASDA, updated to April 2021, identifies the **Ohio County Mine**, operated by Ohio County Coal Company in West Finley Township (Washington County), but notes that it was formerly known as Consol’s **Shoemaker Mine**, and that the latest longwall panel completed there (14-A 8 North) was in 2005. The Shoemaker Mine was not mentioned in either the 5<sup>th</sup> or the 4<sup>th</sup> Act 54 Reports (covering 2008-2018); it was last discussed in the 3<sup>rd</sup> Act 54 Report (covering the period 2003-2008). If it has been renamed and reactivated by a new operator subsequent to the closing of the 5<sup>th</sup> Act 54 period, those relevant facts should be disclosed by PADEP for the benefit of the public.

To make the data understandable, the Excel list for December 2020 should, at minimum, have a column for previous mine (and mine operator) names, if applicable. It also should have additional columns listing when the mine was first permitted, and when the mine ceased production. And, as mentioned above, all column headings should be defined, and any special highlighting should be explained. There also ought to be a heading or title to the spreadsheet, and a date of last revision.

The Department explains on its website that these Annual Updates are a way for it to “*more quickly provide the raw data directly to the public*”, because the 5-year reports required considerable time and expense involving outside contractors. These Annual Updates are meant to be an “*attempt to provide useful, more up-to-date data*” in “*an understandable format each year beginning with the data from 2018*”. Those objectives are reasonable, but the data as posted to date do not begin to further them.

Instead, the data provided so far by the Department in these Annual Updates do exactly the opposite. They are not clear or understandable, they are not comparable to one another or to data presented in the 5-year Reports, and they are not useful to policymakers or the public who may wish to actually understand what is going on and where. Presumably this is the best that Department staff can do, given current resources. If the Department seeks to demonstrate that the 5-year Act 54 Reports were extremely valuable and should continue to be prepared by outside contract workers, then these tables make more sense. Department staff prepared the first Act 54 Report and a supplement to it; both were scathingly criticized.

One thing that **would be very useful** to the public, and in particular to residents of the coalfields in Washington and Greene Counties, would be an online interactive map application that compiles all of these underground mine data in a convenient and visual format. The application could be similar to the *FracTracker* maps (<https://www.fractracker.org/map/us/pennsylvania/>) that for more than 10 years now have been used to track oil and gas activity throughout the Commonwealth, as well as related impacts. The Department's Mining Program is receiving permit applications from most, if not all, underground mine operators in digital form. Those files include detailed and specific inventory information for structures, water supplies, wetlands, streams, etc. It also collects additional information such as the location of each mine's active mining at least every six months. To that the Department could add its ongoing compilation of impacts, restorations, and resolutions. Then landowners could easily locate their property on the map and determine what mining-related activities are happening, what has already happened, and what is proposed to happen. The Department has indicated that it is expanding the records of latitude and longitude to impact categories other than streams. That appears to be a major step forward toward implementing a FracTracker-style geographical information system.

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The following sections examine the details of each of the eight specific impact categories provided in the Department's **Act 54 Yearly Data**, which are listed alphabetically: Land Damage, Methane, Streams, Structures, Utilities, Water Contamination, Water Loss, and Wetlands. For most of these categories, data are provided for all of 2018, 2019, and 2020, and through March for 2021. We discuss each category in the order in which it appears in the tables posted on the website. We recommend that the relevant tables be viewed on the screen when reading the text below.

# LAND DAMAGE

## QUESTIONS/COMMENTS:

- Why include columns for Problem ID # (Column A) and Mine ID # (Column F)? These are not useful or relevant to the public, only perhaps to DEP, and should be deleted. If they have some relevance and should be retained, then the information being conveyed needs to be explained.

- What is the relevance of Depth to Mining (Column J)? Land damage impacts in 2020 occurred where depths ranged from 300 to 1,000 (feet, presumably, beneath the site of observed impact) and in some cases no depth is reported. Depth of mining might be significant, but without further analysis, such as comparing it with other factors such as distance to reported mining damage and time to resolution, by itself it is confusing at best. This is a good example of the value of the recent 5-year Act 54 assessments, which provide more context, additional analyses, and useful explanation.

- What does Column K (Mining distance) mean? Is it the horizontal distance across the land surface from some kind of land impact to the nearest shadow area of a longwall panel? If not, what? And are the entries in “feet”? This should be clarified.

- Additional columns that *would* be useful and should be added:

- Identify the “mine type” (longwall, room-and-pillar, or pillar recovery), because these are the categories in the Act 54 Reports.

- Identify the “type/manner of resolution” (repair, compensation, etc.), again, to be consistent with Act 54 reporting.

- Identify the “latitude/longitude” location of the limits of each impact, or at least the center of impact.

- Identify the “acreage” of each land damage.

- Identify the “mine panel(s)” nearest to where the impact occurred.

- Are all of these impacts “*reported damages*”, are they all “*mine-liable damages*”, or are they a mix? How can the public distinguish? Both classes are significant and should be reported for each impact. A separate column is needed to make this distinction.

- According to your summary description for the Land Damages Data Section: “Land damage from underground coal mining are [sic] grouped into four main impact types: *Tension cracks, Flooding, Mass wasting, and Other* (such as localized sinkholes). Since the Excel table for this category is “Land



Damage”, it is unnecessary clutter, redundant, and not informative that the entries in column B (Description) all are “Land Damage”; instead, the entries in this column should identify which of the four types listed above is/are applicable.

- According to the description, a landowner is supposed to report a problem to the mine operator, who then has **10 days** to report it to DEP. What is “Date Problem Received”? Is this when it was reported to DEP by the operator? In some cases the entry is **much longer than 10 days** from when the problem occurred.

- All incidents of land damage should immediately be reported, not only to the operator but also to PADEP. Large gaps (more than 90 days) between when a problem occurred and when it was “received” (ex., Problem # 5809 in 2018, was **811 days**) should be flagged, investigated by the PADEP, and explained. There also should be a separate column in these tables for “Days from damage to reporting to PADEP”.

- Clarify that the column “Time” (I) is “Time from Date Problem Received to Final Resolution” (if indeed that is what it is). And “time” should probably be replaced by “days”, if that is what the entries signify.

- A column should be added stating the days elapsed between undermining by the panel and observation of impact. Negative numbers would indicate days prior to undermining, positive numbers would indicate days since undermining.

- All column headings should be defined.

- What does it mean that a damage was resolved (i.e., “Time”) in “0” days? What kinds of resolution are these, or were they determined to be not mine liable?

- An additional column that would be useful and should be added, right after Column H (Resolution) is “Type of Resolution”, which should descriptively include repair, compensation, property purchase, secret agreement, etc.

- What is the relevance of last column (L, “RPZ”) to land damage? The 5<sup>th</sup> Act 54 Report, and the Act itself, discuss the RPZ only in relation to water supply impacts. What is the distance/angle used for an RPZ for land damages? What empirical and/or legal support does it have?

- How can a land damage problem not be within the RPZ if it occurred “0” feet from the mining? (see for example “N” for Problem # 5937 in 2018)

- There needs to be some way to track in these tables the restoration status of land impacts beyond the year that the damage first occurred. Perhaps this requires an entirely new Excel sheet for “On-going Unresolved Land Damage Impacts”.

- These tables should be supplemented with detailed maps that identify the location of each land damage impact and the responsible mine.

# METHANE

It is unclear, and not explained, why the Department chose to include Methane as a separate category for these yearly updates. Methane has never been discussed separately in the Act 54 Reports, and it is not mentioned in Act 54. When it has been mentioned in the Act 54 Reports, it is included with the water loss/water contamination issue. Inasmuch as there are only 2 reported issues of “methane” among the 3.25 years covered by these yearly updates so far, it would appear to be simpler to have incorporated these two instances (one in 2018 and one in 2019) into the “water contamination” category.

## QUESTIONS/COMMENTS:

- Why include columns for Problem ID # (Column A) and Mine ID # (Column F)? These are not useful or relevant to the public, only perhaps to DEP, and should be deleted. If they have some relevance and should be retained, then the information being conveyed needs to be explained.
- As with other impacts from underground mining, the initial reporting of methane problems should be revised. Currently, the process works as follows, per the introductory paragraph on the Yearly Updates webpage:

If a homeowner believes that undermining is causing a methane problem on their property, they report this to the mine operator. The operator will report the claim to the Department.

Accordingly, there may be a lag, sometimes a very large lag, between the occurrence of a problem and the Department learning about it. It would be more helpful to the affected public if the landowner was directed to initially notify both the mine operator and the Department at the same time. That way, if the operator does not resolve the problem in a timely fashion, then the Department will be aware, can intervene, and hopefully can help resolve the problem quicker.

- A separate column is needed to identify whether the impact was determined to be “*mine-liable*” or not (unless these tables list only those impacts which were determined to be mine-liable, in which case that should be explained up front).
- All column headings should be defined.
- Another column that would be useful and should be added after “Mine Name” (G) is “Mine Type” (longwall, room-and-pillar, or pillar recovery).

- An additional column that would be useful and should be added, right after Column H (Resolution) is “Type of Resolution”, which should descriptively include repair, compensation, property purchase, secret agreement, etc.

-Is the column “Time” (I) reporting “Time from Date Problem Received to Final Resolution” (or something else)? And “time” should probably be replaced by “days”, if that is what the entries signify.

- Clarify that the units in Column J (Mining depth) [below the observed impact?] and Column K (Distance to mining) [horizontal distance across the surface to shadow area above the nearest panel(s)?] are in “feet”, if indeed that is what they are.

- The location of each methane issue should be identified by latitude/longitude.

- These tables should be supplemented with detailed maps that identify the location of each methane impact and the responsible mine.

## **STREAMS**

Stream effects are subdivided into 3 categories: Flow Loss, Pooling, and Fracture/Heaving.

### **Flow Loss**

#### QUESTIONS/COMMENTS:

- All column headings need to be defined. For example, it is not clear what the heading “Utility Name” (Column D) means in relation to streams. The entries in this column all appear to be stream or tributary segment numbers identifiable in PASDA (but whatever the source, it should be named).

- In addition to the stream number, a separate column for “Stream Name” should be added (just as it is for the Pooling” tables).
- The following columns are not useful or relevant to the public, only perhaps to DEP, and should be deleted: Utility Number (E), Panel ID (G), Flow Loss ID (K), and Impact ID (L). If they have some relevance and should be retained, they need to be explained.
- The 3 separate columns for Month/Day/Year could be combined into one “Date of Occurrence” or “Impact Date” (just as in the Pooling and Fracture/Heaving tables).
- One column that would be useful and should be added is “Mine Type” (longwall, room-and-pillar, or pillar recovery)
- Two columns that would be useful and should be added are “Designated Use” and “Existing Use” for each impacted stream segment pre-mining.
- Two more columns that would be useful and should be added are “Depth to Mining” and “Mining Distance”, for each impacted stream segment, so that these tables are comparable to the others for Land Damage, Structures, etc.
- Another column that would be useful and should be added is “Predicted? Y/N”, which datum should be available from Module 8 in every permit application.
- A column should be added stating the days elapsed between undermining by the panel and observation of flow loss impact. Negative numbers would indicate days prior to undermining, positive numbers would indicate days since undermining.
- Three other columns that would be useful and should be added are “Date Augmentation Began”, “Source of Augmentation Water”, and “Date Restoration Began” (“restoration” being physical activities other than augmentation, such as shaving/grading heaves, grouting, liner installation, etc.).
- Another column that would be useful and should be added is “Status at Year End”, which descriptively could include restored, augmentation ongoing, grouting ongoing, other restoration ongoing, restoration not begun, other.
- Another column should be added to indicate whether all or part of a specific Flow Loss impact overlaps geographically with either a pooling impact or a fracture/heave impact, and if so, by how much.
- There needs to be some way to track in these tables the restoration status of streams beyond the single year that the flow loss first occurred. Perhaps this requires an entirely new Excel sheet for “On-going/Unresolved Flow Losses”. That table should identify the date of the initial impact as well as the elapsed time from initial impact either to documented restoration or to the date being reported on the table.

- These tables should be supplemented with detailed maps that identify the location of each flow loss impact and the responsible mine.

## Stream Pooling

### QUESTIONS/COMMENTS:

- The Update for 2020 for Pooling is simply a verbatim copy of the information in the 2018 Update. Provide actual 2020 information, if any was collected.

- The following columns are not useful or relevant to the public, only to DEP, and should be deleted: Panel ID (H), Impact ID (I), Utility Number (J), and Pooling ID (K). If they have some relevance and should be retained, then they need to be explained.

- One column that would be useful and should be added is “Company Name” (this would allow the Pooling table to be consistent with the Flow Loss and Heaving tables)

- Another column that would be useful and should be added is “Mine Type” (longwall, room-and-pillar, or pillar recovery)

- Two columns that would be useful and should be added are “Designated Use” and “Existing Use” pre-mining for each stream.

- Two more columns that would be useful and should be added are “Depth to Mining” and “Mining Distance”, for each impacted stream segment, so that these tables are comparable to the other for Land Damage, Structures, etc.

- Another column that would be useful and should be added is “Predicted? Y/N”, which should be available from Module 8 in every permit application.

- Two other columns that would be useful and should be added are “Maximum Depth of Pooling” observed in the affected segment, and “Consistency with Prediction” (more, less, same).

- A column should be added stating the days elapsed between undermining by the panel and observation of the pooling impact. Negative numbers would indicate days prior to undermining, positive numbers would indicate days since undermining.

- Two other columns that would be useful and should be added are “Date Gate Cutting Began” and “Date Gate Cutting Completed” (this process typically lasts only a month or less). Gate Cutting should **not** be confused with pooling restoration, because the stream is not “restored” until after monitoring has documented that both the pre-mining flow and the pre-mining biology have been achieved.

- Another column that would be useful and should be added is “Status at Year End”, which descriptively could include: gate cutting not begun, gate cutting ongoing, post-gate cut monitoring ongoing, or flow/biological restoration complete.
- Another column should be added to indicate whether all or part of a specific Pooling impact overlaps geographically with either a flow loss impact or a fracture/heave impact.
- There needs to be some way to track in these tables the restoration status of streams beyond the year that the pooling first occurred. Perhaps this requires an entirely new Excel sheet for “On-going/Unresolved Pooling Impacts”. That table should identify the date of the initial impact as well as the elapsed time from initial impact either to documented flow/biological restoration or to the date being reported on the table.
- These tables should be supplemented with detailed maps that identify the location of each pooling impact and the responsible mine.

## **Stream Fracture/Heaving**

### QUESTIONS/COMMENTS:

- The typo “Frature” at the top of the 2018 and 2020 tables should be corrected to “Fracture”.
- The typo “Pamel ID” at the top of the 2018 and 2019 tables should be corrected to “Panel ID”.
- The following columns are not useful or relevant to the public, only perhaps to DEP, and should be deleted: Utility Number (E or F, depending on year), Panel ID (G or H), Fracture ID (I or L), and Impact ID (J or M). If they have some relevance and should be retained, then they need to be explained.
- The column “Utility Name” (E) in the 2018 and 2019 tables should be renamed “Stream ID” to be consistent with the 2020 table (Column D).
- One column that would be useful and should be added, in addition to the “Stream ID” number, is “Stream Name” (this would allow the Fracture/Heaving table to be consistent with the Pooling table).
- The asterisk in Column N (length of Fracture/Heave) in the 2019 table should be explained like it is in the 2018 table, and the “a” in the same column in the 2020 table should be changed to an asterisk.
- Another column that would be useful and should be added is “Mine Type” (longwall, room-and-pillar, or pillar recovery).
- Two columns that would be useful and should be added are “Designated Use” and “Existing Use” pre-mining for each stream.

- Two more columns that would be useful and should be added are “Depth to Mining” and “Mining Distance”, for each impacted stream segment, so that these tables are comparable to the other for Land Damage, Structures, etc.
- It is not clear how Fracture/Heaving differs or is distinguished from Flow Loss. A column should be added to indicate whether all or part of a specific Fracture/Heaving impact overlaps geographically with either a flow loss or a pooling impact.
- Two other columns that would be useful and should be added are “Predicted? Y/N” which should be available from Module 8 in every permit application, and “Consistency with Prediction” (more, less, same).
- A column should be added stating the days elapsed between undermining by the panel and observation of the fracture/heaving impact. Negative numbers would indicate days prior to undermining, positive numbers would indicate days since undermining.
- Another column that would be useful and should be added is “Date Restoration Began”.
- Another column that would be useful and should be added is “Status at Year End”, which could include descriptively restored, restoration ongoing, restoration not begun, other.
- There needs to be some way to track in these tables the restoration status of streams beyond the year that the fracture/heaving first occurred. Perhaps this requires an entirely new Excel sheet for “On-going/Unresolved Fracture/Heaving Impacts”. That table should identify the date of the initial impact as well as the elapsed time from initial impact either to documented restoration or to the date being reported on the table.
- These tables should be supplemented with detailed maps that identify the location of each fracture/heaving impact and the responsible mine.

## **STRUCTURES**

### **QUESTIONS/COMMENTS:**

- All column headings need to be defined. For example, it is not clear what the heading “Time” (Column I) refers to – it should be the elapsed time from damage to resolution but appears to be the time from when a problem was “received” (and what is “received”? received by whom, DEP?) to resolution. Time presumably refers to “days” and the heading probably should be changed to “Days from \_\_ to \_\_\_”. Entries with a zero or a blank need to be explained.
- All incidents of structure damage should immediately be reported, not only to the operator but to PADEP. Large gaps (more than 90 days) between when a problem occurred and when it was “received”

(such as Problem ID 6238 in 2020, where the gap is **140 days**) should be flagged, investigated by the PADEP, and explained. There also should be a separate column for it in these tables (Days from damage to reporting to PADEP).

- The following columns are not useful or relevant to the public, only perhaps to DEP, and should be deleted: Problem ID (A), and Mine ID (F). If they have some relevance and should be retained, then the information being conveyed needs to be explained.

- Column B (Description) is unnecessary clutter, redundant, and not informative, inasmuch as all its entries are “structure damage” and this entire table is for Structure Damage. It would be better to change the heading to “Type of structure”, and list such things as: dwelling, outbuilding, barn, church, etc.

- Another column that would be useful and should be added after “Mine Name” (G) is “Mine Type” (longwall, room-and-pillar, or pillar recovery).

- A separate column is needed to identify whether the impact was determined to be “*mine-liable*” or not (unless these tables list only those impacts which were determined to be mine-liable, in which case that should be explained up front).

- A column should be added stating the days elapsed between undermining by the panel and observation of the structure impact. Negative numbers would indicate days prior to undermining, positive numbers would indicate days since undermining.

- An additional column that would be useful and should be added, right after Column H (Final Resolution Date) is “Type of Resolution”, which should include descriptive entries such as repair, compensation, property purchase, secret agreement, etc.

- What is the relevance of Mining Depth (Column J)? Impacts in 2020 occurred where depths range from 220 to 1,000 (feet, presumably). Depth of mining beneath the impact site might be significant, but without further analysis, such as comparing it with other factors such as distance to mining and time to resolution, by itself it is confusing at best. This is a good example of the value of the 5-year Act 54 assessments, which provide more context, additional analyses, and useful explanation.

- What does Column K (Distance to Mining) mean? Is it the horizontal distance from the impacted structure to the shadow area of the nearest longwall panel(s)? If not, what? And if the entries are in “feet”, that should be stated.

- What is the relevance of the last column (L, “RPZ”) to structure damage? The 5<sup>th</sup> Act 54 Report, and the Act itself, discuss the RPZ only in relation to water supply impacts. What is the distance/angle used for an RPZ for structure damages? What are the empirical and legal bases for this RPZ?

- The location of each structure issue should be identified by latitude/longitude.

- These tables should be supplemented with detailed maps that identify the location of each structure impact and the responsible mine.



# UTILITIES

## QUESTIONS/COMMENTS:

- It's not clear why this category is included at all. Damage to utilities is not specifically mentioned in Act 54. The general public is not particularly concerned about damages to (public/private?) utilities, unless it directly affects their service. These impacts appear to be very uncommon (one in 2018, one in 2019, and none in 2020 or the first quarter of 2021), and might better be combined with "structures".
- Why include columns for Problem ID # (Column A) and Mine ID # (Column F)? These are not useful or relevant to the public, only perhaps to DEP, and should be deleted. If they have some relevance and should be retained, then the information being conveyed needs to be explained.
- Column B (Description) is unnecessary clutter, inasmuch as all of the entries are "Utility", but that should be obvious because the tables in this group all are "Utility". Column C (Description) is more informative.
- A column that would be useful and should be added after G (Mine Name) is "Mine Type" (longwall, room-and-pillar, or pillar recovery).
- Another column that would be useful and should be added before H (Final Resolution Date) is "Final Resolution", which should be populated with descriptive entries such as repair, compensation, property purchase, secret agreement, etc.
- A separate column is needed to identify whether the impact was determined to be "*mine-liable*" or not (unless these tables list only those impacts which were determined to be mine-liable, in which case that should be explained up front).
- Clarify that the column "Time" (I) is "Time from Date Problem Occurred to Final Resolution" (if indeed that is what it is). And "time" should probably be replaced by "days", if that is what the entries signify.
- A column should be added stating the days elapsed between undermining by the panel and observation of the utility impact. Negative numbers would indicate days prior to undermining, positive numbers would indicate days since undermining.
- What is the relevance of the last column (L, "RPZ") to utility damage? The 5<sup>th</sup> Act 54 Report, and the Act itself, discuss the RPZ only in relation to water supply impacts. What is the distance/angle used for an RPZ for utility damages? What are the empirical and legal bases for this RPZ?
- The location of each utility issue should be identified by latitude/longitude.
- These tables should be supplemented with maps that identify the location of the utility impacts and the responsible mine.

# WATER LOSS

## QUESTIONS/COMMENTS:

- All column headings need to be defined. For example, it is not clear what the heading “Time” (Column I) refers to – it appears to be the time from when a problem was “received” (and what is “received”? received by whom, DEP?) to resolution. Time presumably refers to “days” and the heading probably should be changed to “Days to \_\_\_”. Entries with a zero or a blank need to be explained.
- All incidents of water supply damage should immediately be reported, not only to the mine operator but to PADEP. According to the introductory description for Water Loss, “*If the water user or owner believes their water has been affected by mining, they must contact the mine operator. The operator will then report this to the Department within 24 hours.*” This often is the case, but not always. Large gaps (more than 90 days) between when a problem occurred and when it was reported to the Department, or “received” (such as Problem ID 6210 in 2020, where the gap is **731 days**, or Problem ID 5745 in 2018, where the gap is **2,929 days** [8 years, 7 days]) should be flagged, investigated by the PADEP, and explained. There also should be a separate column for it in these tables (Days from damage to reporting to PADEP).
- The following two columns are not useful or relevant to the public, only perhaps to DEP, and should be deleted: Problem ID (A), and Mine ID (F). If they have some relevance and should be retained, then the information being conveyed needs to be explained.
- Column B (Description) is unnecessary clutter, redundant, and not informative, inasmuch as all its entries are “water loss” and this entire table is for Water Loss. It would be better to change the heading to “Type of water supply”, and list such things descriptively as: well, spring, pond, etc.
- A column that would be useful and should be added after “Mine Name” (G) is “Mine Type” (longwall, room-and-pillar, or pillar recovery).
- A separate column is needed to identify whether the impact was determined to be “*mine-liable*” or not (unless these tables list only those impacts which were determined to be mine-liable, in which case that should be explained up front).
- A column should be added reporting whether the impact was predicted (“Predicted? Y/N”) according to Module 8 of the permit application.
- An additional column that would be useful and should be added, right after Column H (Final Resolution Date) is “Type of Resolution”, which should include repair of damaged well, new well, connection to public supply, compensation, property purchase, secret agreement, etc.
- A column should be added stating the days elapsed between undermining by the panel and observation of the water loss impact. Negative numbers would indicate days prior to undermining, positive numbers would indicate days since undermining.

- What is the relevance of Depth to Mining (Column J)? Impacts in 2020 occurred where depths range from 100 to 938 (feet, presumably). Depth of mining might be significant, but without further analysis, such as comparing it with other factors such as distance to mining and time to resolution, by itself it is confusing at best. This is a good example of the value of the 5-year Act 54 assessments, which provide more context, additional analyses, and useful explanation.
- What does Column K (Mining Distance) mean? Is it the horizontal distance from the impacted water supply to the nearest longwall panel? If not, what? And if the entries are in “feet”, that should be stated.
- The location of each water loss issue should be identified by latitude/longitude.
- These tables should be supplemented with detailed maps that identify the location of each water loss impact and the responsible mine.

## WATER CONTAMINATION

### QUESTIONS/COMMENTS:

- All column headings need to be defined. For example, it is not clear what the heading “Time” (Column I) refers to – it appears to be the time from when a problem was “received” (and what is “received”? received by whom, DEP?) to resolution. Time presumably refers to “days” and the heading probably should be changed to “Days from \_\_\_ to \_\_\_”. Entries with a zero or a blank need to be explained.
- All incidents of water contamination should immediately be reported, not only to the mine operator but to PADEP. According to the introductory description for Water Loss, “*If the water user or owner believes their water has been affected by mining, they must contact the mine operator. The operator will then report to the Department within 24 hours.*” This often appears to be the case, but not always. Large gaps between when a problem occurred and when it was reported to the Department, or “received” (such as Problem ID 6333 in 2020, where the gap is **75 days**, or Problem ID 6473 in 2021, where the gap is **1,101 days**) should be flagged, investigated by the PADEP, and explained. There also should be a separate column for it in these tables (Days from damage to reporting to PADEP).
- A separate column is needed to identify whether the impact was determined to be “*mine-liable*” or not (unless these tables list only those impacts which were determined to be mine-liable, in which case that should be explained upfront).
- The following two columns are not useful or relevant to the public, only perhaps to DEP, and should be deleted: Problem ID (A), and Mine ID (F). If they have some relevance and should be retained, then the information being conveyed needs to be explained.

- Column B (Description) is unnecessary clutter, redundant, and not informative, inasmuch as all its entries are “water contamination” and this entire table is for Water Contamination. It would be better to change the heading to “Type of water supply”, and list such things as: well, spring, pond, etc.
- A column that would be useful and should be added after “Mine Name” (G) is “Mine Type” (longwall, room-and-pillar, or pillar recovery).
- A column should be added reporting whether the impact was predicted (“Predicted? Y/N”) according to Module 8 of the permit application.
- An additional column that would be useful and should be added, right after Column H (Final Resolution Date) is “Type of Resolution”, which should include descriptive entries such as cleanup of damaged well, new well, connection to public supply, compensation, property purchase, secret agreement, etc.
- A column should be added stating the days elapsed between undermining by the panel and observation of the water contamination impact. Negative numbers would indicate days prior to undermining, positive numbers would indicate days since undermining.
- What is the relevance of Depth to Mining (Column J)? Impacts in 2020 occurred where depths range from 135 to 1,024 (feet, presumably). Depth of mining might be significant, but without further analysis, such as comparing it with other factors such as distance to mining and time to resolution, by itself it is confusing at best. This is a good example of the value of the 5-year Act 54 assessments, which provide context, additional analyses, and useful explanation.
- What does Column K (Mining Distance) mean? Is it the horizontal distance from the impacted water supply to the nearest longwall panel(s)? If not, what? And if the entries are in “feet”, that should be stated.
- The location of each water contamination issue should be identified by latitude/longitude.
- These tables should be supplemented with detailed maps that identify the location of each water contamination impact and the responsible mine.

# WETLANDS

## QUESTIONS/COMMENTS:

- There are no data or annual spreadsheets provided for wetlands. The explanation in part, as provided in the introduction, is:

*As part of the permitting process, mine operators are required to delineate wetlands in each permitted area prior to mining and again five years post-mining. If a net loss in wetlands is identified during the post-mining delineation, the operators are required to develop a mitigation plan in which new wetlands of an equivalent size and quality will be created.*

*Data on wetlands consists of measuring acreage of small parcels of land before and after mining. The Department is still formulating a way to represent this data and more will be available in future updates.*

The delineation of wetlands pre- and post-mining has been described in TGD 563-2000-655 since 2005. The Corps Manual for wetland identification and delineation (adopted by the Department) has existed since 1987, and regional supplements were published nearly a decade ago. According to the TGD, wetlands are to be delineated prior to mining, and a prediction is supposed to be made as to whether the wetland will be adversely affected. Each wetland then is supposed to be assessed 12 months following mining. It is unclear whether the 12-month follow-ups are ever done, or whether any predictions of adverse wetland effects ever are made or followed-up. No agency reviews of the accuracy of wetland delineations pre- or post-mining are being conducted, even though there exists a formal (and cost-free) process to do so, called a Corps of Engineers JD (jurisdictional determination). Thus, the accuracy of any wetland assessment regarding net changes is highly suspect.

Section 10 in the Department's 5<sup>th</sup> Act 54 Report notes that wetland data collected and evaluated by the Department are inadequate:

*As a result of the incomplete and inconsistent data obtained for wetlands, the University could only report limited conclusions.*

These fundamental deficiencies in the identification of wetlands must be corrected before the Department can credibly assert that it is protecting these valuable and scarce resources.

# Transmittal of revised comments on second version of updates from BUMIS to the Department, 28 December 2021

**From:** Aimee Erickson <[aimee@citizenscoalcouncil.org](mailto:aimee@citizenscoalcouncil.org)>  
**Date:** Tuesday, December 28, 2021 at 10:56 AM  
**To:** John Stefanko <[jstefanko@pa.gov](mailto:jstefanko@pa.gov)>  
**Cc:** <[RA-EPMININGPERMITS@pa.gov](mailto:RA-EPMININGPERMITS@pa.gov)>  
**Subject:** CCC updated comments on Act 54 yearly data updates

Please see the attached updated comments on the PADEP Act 54 yearly data website.

Thanks,

*Aimee Erickson*  
Executive Director  
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130 Friend Road  
Washington, PA 15301  
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**Our Purpose:** The Citizens Coal Council is a national network that advocates for full enforcement of the federal Surface Mining Control and Reclamation Act (SMCRA) and its delegated state programs.

**Our Mission:** To inform, empower and work for and with communities affected by mining, processing and use of coal.

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One attachment • Scanned by Gmail ⓘ



## **Comments on *Act 54 Yearly Data Updates***

As Posted on the  
Pennsylvania Department of Environmental Protection Web  
Page

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12 May 2021

**Revised 9 December 2021**

## INTRODUCTION

Since the end of 2020, the PADEP Bureau of Mining Programs has posted on its website, and periodically updated, **Act 54 Yearly Data** (beginning with 2018 data):

<https://www.dep.pa.gov/Business/Land/Mining/BureauofMiningPrograms/Act-54-Yearly-Data/Pages/default.aspx>

These Yearly Data provide certain information about ongoing impacts to structures, water supplies, land, and streams from underground coal mining operations subsequent to the publication of the latest (5<sup>th</sup>) 5-Year Act 54 Report. According to the opening webpage:

*With the availability of tools and applications that allow for **real time data compiling and public release**, the Department is publishing the data from the Bituminous Underground Mining Information System (BUMIS) **in an understandable format each year** beginning with the data from 2018. [bold added]*

The format of the posted BUMIS data is far from “understandable”. Terms and table headings are not defined. Also, these Yearly Data updates are mostly not comparable with the underground coal mining data that have been analyzed and made publicly available over the last 25 years in the Department’s 5-Year Act 54 Reports.

We first examined these *Act 54 Yearly Data* updates and provided specific comments and suggestions for improvement to them to the Bureau of Mining Programs in May 2021. Since then, some helpful changes and corrections to the online Yearly Data have been made by the Department. Now, seven months later, we are revisiting the Yearly Data updates. This revised Commentary examines each of the 9 “Data Sections”, identifies changes that we notice have been made since May 2021, and lists changes that we believe still should be made to make the data more useful and understandable to the general public. We are providing this revised Commentary both to the Mining Program, and also to the link provided on the Updates webpage which solicits comments or suggestions ([RA-EPMININGPERMITS@pa.gov](mailto:RA-EPMININGPERMITS@pa.gov)).



In the sections below we repeat suggestions/comments that we made in May 2021 that have not yet been changed (in **black bold**). We also identify recent changes that we recognize and which we believe are positive/beneficial (in **green bold**) or not helpful (in **red bold**). (Note: all brown text is quoted directly from the *Act 54 Yearly Data* webpage as of November 2021.)

One of the general questions on the opening webpage is:

How many underground mines are operating in Pennsylvania?

When you click on this link, you get a list of “existing mines” (as of December 2020). This list has not been recently updated, but hopefully *will* be updated at the end of 2021. This list identifies 41 “active” mines, including 7 longwall mines. [The other status categories include “Approved Cessation” (11), “Not Started” (3), “Stage 2 Approved” (7), “Stage 2 Eligible” (4), and “Stage 1/Regraded” (14). These appear to represent various types of inactive mines tracked by the Department, but none of those categories is defined.]

- **The status categories (and all other headings) should be defined.**
- **Columns should be added listing when each mine was first permitted, and when the mine ceased production (if applicable).**
- **An interactive map has been added which identifies active and pending mine boundaries, and longwall panels (active, completed, or projected). These are helpful.**

The following pages provide specific comments and suggestions for each of the 9 Data Sections, in the alphabetical order they are listed on PADEP’s *Act 54 Yearly Data* webpage.

## 1. LAND DAMAGE

Data for land damage are presented for 2018, 2019, 2020, and through 29 November 2021.

- **Columns for Problem ID # (Column A) and Mine ID # (Column F) should be deleted. These are not informative or relevant to the public, only perhaps to DEP. If they have some**

relevance and should be retained, then the information being conveyed needs to be explained.

- The relevance of Column K (Depth to Mining) should be explained (presumably the numbers are in “feet” and represent distance to coal existing beneath the site of the observed impact). In some cases no depth is reported. Depth of mining might be significant, but without further analysis, such as comparing it with other factors such as distance to reported mining damage and time to resolution, by itself it is confusing at best. This is a good example of the value of the 5-year Act 54 assessments, which provide more context, additional analyses, and useful explanation.

- **Column L has been renamed to make clear it is the “Distance to Nearest Mining”.** Presumably it is the horizontal distance across the land to the nearest vertical shadow area of a longwall panel -- if not, what? And are the entries in “feet”? This should be clarified.

- Additional columns that would be useful and should be added:

- Identify the “mine type” (longwall, room-and-pillar, or pillar recovery), because these are the long-established categories in the Act 54 Reports.

- Identify the “latitude/longitude” location of the limits of each impact, or at least the center of impact.

- Identify the “acreage” or “square footage” of each land damage.

- Identify the “mine panel(s)” nearest to where the impact occurred.

- **A new column (J) “Description” [of the final resolution] has been added; this helps make these data more useful and also consistent with Act 54 reporting.**

- It is not clear whether all of these impacts are “*reported* damages”, are all “*mine-liable* damages”, or are a mix. Both classes are significant and should be noted for each impact. A separate column should be added to make this distinction, and to identify who “reported” the damage (landowner, operator, shadow inspector, etc.).

- The summary description for the Land Damages Data Section notes: “Land damage[s] from underground coal mining are grouped into four main impact types: *Tension cracks, Flooding, Mass wasting, and Other* (such as localized sinkholes). Since the Excel table for this category is “Land Damage”, it is unnecessary clutter, redundant, and not informative that all the entries in column B (Description) are “Land Damage”; instead, the entries in this column should identify which of the four types listed above is/are applicable.

- According to the introductory description on the website, a landowner is supposed to report a problem to the mine operator, who then has 10 days to report it to DEP. “Date Problem Received” is not clear. Is this when it was reported to DEP by the operator? In

some cases the entry is **much longer than 10 days** from when the problem occurred. These should be investigated.

- All incidents of land damage should be reported immediately, not only to the operator but also to PADEP. Large gaps (more than 90 days) between when a problem occurred and when it was “received” (ex., Problem # 5809 in 2018, was **811 days**) should be flagged, investigated by the PADEP, and explained in footnotes. There also should be a separate column in these tables for “Days from damage to reporting to PADEP”.

- **The column previously labelled “Time” has been clarified as “Time to [presumably Final] Resolution”.** The word “time” should probably be replaced by “days”, because that apparently is what the entries signify. Also, this duration should be measured from when the damage *occurred*, not when the DEP learned about it.

- A column should be added stating the days elapsed between undermining by the nearest panel and observation of impact. Negative numbers would indicate days prior to undermining, positive numbers would indicate days since undermining.

- All column headings should be defined.

- **The column “RPZ” has been deleted. This is appropriate, inasmuch as the 5<sup>th</sup> Act 54 Report, and the Act itself, discuss an RPZ only in relation to water supply impacts.**

- There needs to be some way to track in these tables the restoration status of land impacts beyond the year that the damage first occurred. This may require an entirely new Excel sheet for “On-going Unresolved Land Damage Impacts”.

- These tables should be supplemented with detailed maps that identify the location of each land damage impact and the resolution status.

## 2. MAPS

**Links to the following 6 GIS interactive maps or tools are now provided:**

- **Underground Bituminous Coal Mining**
- **PA Mine Map Atlas**
- **PA DEP GIS Open Data Portal Inventory System**
- **PA Historic Underground Mine Map**
- **PASDA Map**
- **PA DEP Mine Subsidence Insurance Risk**

This is a good start toward digitizing some Act 54 information. For the most part, however, these maps/tools only show existing or historical mining information. What would be more helpful and important in the context of Act 54 is to map the effects of underground coal mining: to structures, water supplies, streams, etc., including the specific location of impacted features, whether or not the impact was predicted, the nature of the impact, and the type and status of restoration or resolution. These *Act 54 Yearly Data* updates are meant to be annual interim updates between the formal 5-year Act 54 Reports. As reported in the 5<sup>th</sup> Act 54 Report in 2020 (and as also was the case for the 4<sup>th</sup> and 3<sup>rd</sup> Reports), much of the data was provided to the University researchers by the Department and by mine operators in digital formats and incorporated into GIS databases created specifically for those analyses; the Act 54 Reports discuss having received or created GIS shapefiles or other spatial data files for most of the key elements evaluated. Thus, to be comparable to the 5-year Reports, these updates should likewise provide digital representations of the annually-reported effects of underground mining.

### 3. METHANE

Given the fact that methane is now recognized as a key greenhouse gas (although its discharges into the atmosphere by coal mines are not regulated or monitored), it is encouraging to see methane listed here as an area of concern to the Department. However, it is unclear, and not explained, why the Department chose to include methane as a separate category for these *Act 54 Yearly Data* updates. Methane has never been discussed separately in the Act 54 Reports, and it is not mentioned in Act 54. When it *has* been mentioned at all in the Act 54 Reports, it typically is included with the water supply loss/contamination issue. Inasmuch as there are only 2 reported issues with “methane” during the nearly 4 years covered by these yearly data updates through 29 November 2021 (one in 2018 and one in 2019), and both relate to methane in a water well, it would be simpler to have incorporated these two instances into the “water contamination” category.

**- Columns for Problem ID # (Column A) and Mine ID # (Column F) should be deleted These are not informative or relevant to the public, only perhaps to DEP. If they have some relevance and should be retained, then the information being conveyed needs to be explained.**

**- As with other impacts from underground coal mining, the initial reporting of methane problems should be revised. Currently, the process works as follows, per the introductory paragraph on the *Act 54 Yearly Data* updates webpage:**

If a homeowner believes that undermining is causing a methane problem on their property, they report this to the mine operator. The operator will report the claim to the Department.

Accordingly, there can be a lag (in the 2019 case, 37 days) between the occurrence of a methane “problem” and the Department learning about it. It would be more helpful to the affected public if the landowner was directed to initially notify both the mine operator and the Department at the same time. That way, if the operator does not resolve the problem in a timely fashion, then the Department will be aware, can intervene, and hopefully can help resolve the problem quicker.

**- The column previously labelled “Time” has been clarified as “Time to [presumably Final] Resolution”.** The word “time” should probably be replaced by “days”, because that apparently is what the entries signify. Also, this duration should be measured from when the damage *occurred*, not when the DEP learned about it.

- It is not clear whether both of the listed impacts are “*reported damages*”, are “*mine-liable damages*”, or are a mix. Both classes are significant and should be noted for each impact. A separate column should be added to make this distinction, and to identify who “reported” the damage (landowner, mine operator, shadow inspector, etc.).

- All column headings should be defined.

- Another column that would be useful and should be added after “Mine Name” (G) is “Mine Type” (longwall, room-and-pillar, or pillar recovery).

**- A new column (J) “Description” [of the final resolution] has been added; this helps make these data more useful and also consistent with Act 54 reporting.**

**- The column “Distance to Mining” has been renamed to make clear it is the “Distance to Nearest Mining”.** Presumably it is the horizontal distance across the land to the nearest vertical shadow area of a longwall panel -- if not, what?

- Clarify that the units in Column K (Mining depth) and Column L (Distance to nearest mining) are in “feet”, if indeed that is what they are.

**- The column “RPZ” has been deleted. This is appropriate, inasmuch as the 5<sup>th</sup> Act 54 Report, and the Act itself, discuss an RPZ only in relation to water supply impacts.**

- The location of each methane issue should be identified by latitude/longitude.

- These tables should be supplemented with detailed maps that identify the location of each methane impact and the resolution status.

## 4. STREAMS

Stream effects are subdivided into 3 categories: Flow Loss, Pooling, and Fracture/Heaving. Data reportedly are current as of 11 June 2021, but no data for 2021 are provided in any of the 3 categories.

## Stream Flow Loss

- All column headings need to be defined. For example, it is not clear what the headings “Utility ID” (Column L) or “Utility #” (Column M) mean in relation to streams. These columns should be deleted.
- **The following columns now grouped under “BUMIS Information” (are not all of these tabulated data from BUMIS?) are not informative or relevant to the public, only perhaps to DEP, and should be deleted: Flow Loss ID (I), Impact ID (J), Panel ID (K), Utility ID (L), and Utility # (M). If they have some relevance and should be retained, they need to be explained.**
- A column “Mining Type” (longwall, room-and-pillar, or pillar recovery) now has been added (Column D) after the Mine Name (Column C).
- The 3 separate columns for Month/Day/Year now have been combined into one “Date of Occurrence”.
- Column F (“Stream”) now identifies the stream name/number.
- Two columns that would be useful and should be added are “Designated Uses” and “Existing Uses” for each impacted stream segment pre-mining.
- Two more columns that would be useful and should be added are “Depth to Mining” and “Mining Distance”, for each impacted stream segment, so that these tables are comparable to the others for Land Damage, Structures, etc.
- Two columns that would be useful and should be added are “Predicted? Y/N” (which datum should be readily available from Module 8 in every permit application), and “Consistency with Prediction Length” (longer, shorter, same).
- A column should be added stating the days elapsed between undermining by the panel and observation of flow loss impact. Negative numbers would indicate days prior to undermining, positive numbers would indicate days since undermining.
- Other columns that would be useful and should be added are “Date Augmentation Began” and “Source of Augmentation Water”, and “Type of Restoration” (“Restoration” being physical activities *other than* augmentation, such as shaving/grading heaves, grouting, liner installation, etc.) and “Date Restoration Began”.
- Another column that would be useful and should be added is “Status at Year End”, which descriptively could include entries such as: restored, augmentation ongoing, grouting ongoing, other restoration ongoing, restoration not begun, other.

- Another column should be added to indicate whether all or part of a specific Flow Loss impact overlaps geographically with either a pooling impact or a fracture/heave impact, and if so, by how much.
- Another column should be added to indicate the elapsed time from initial impact to either documented restoration or to the date being reported on the table.
- These tables should be supplemented with detailed maps that identify the location of each flow loss impact and the type and status of restoration.

## Stream Pooling

- The Update for 2020 for Pooling has been corrected, and no longer is simply a verbatim copy of the information in the 2018 Update.
- The following columns now grouped under “BUMIS Information” (are not all of these data from BUMIS?) are not informative or relevant to the public, only perhaps to DEP, and should be deleted: Impact ID (I), Panel ID (J), Pooling ID (K), Utility ID (L), and Utility # (M). If they have some relevance and should be retained, they need to be explained.
- One useful column that has been added is “Company Name” (Column B).
- Another useful column that has been added is “Mining Type” (Column D; longwall, room-and-pillar, etc.)
- Two columns that would be useful and should be added are “Designated Uses” and “Existing Uses” pre-mining for each stream.
- Two more columns that would be useful and should be added are “Depth to Mining” and “Mining Distance”, for each impacted stream segment, so that these tables are comparable to the others for Land Damage, Structures, etc.
- Another column that would be useful and should be added is “Maximum/Minimum Depth of Pooling” observed in the affected segment.
- Two columns that would be useful and should be added are “Predicted? Y/N” (which should be readily available from Module 8 in every permit application), and “Consistency with Prediction Length” (longer, shorter, same).
- A column should be added stating the days elapsed between undermining by the panel and observation of the pooling impact. Negative numbers would indicate days prior to undermining, positive numbers would indicate days since undermining.
- Two other columns that would be useful and should be added are “Date Gate Cutting Began” and “Date Gate Cutting Completed” (this process typically lasts only a month or less). Gate

Cutting should *not* be confused with pooling restoration, because (a) the gate cutting is additional impact to the stream which typically does not entirely overlap the pooled section, and (b) the stream is not “restored” until after monitoring has documented that both the pre-mining flow and the pre-mining biology have been achieved throughout the impacted stream segment.

- Another column that would be useful and should be added is “Status at Year End”, where entries descriptively could include: gate cutting not begun, gate cutting ongoing, post-gate cut monitoring ongoing, or flow and biological restoration complete.

- Another column should be added to indicate whether all or part of a specific Pooling impact overlaps geographically with either a flow loss impact or a streambed fracture/heave impact.

- Another column should be added to indicate the elapsed time from initial impact to either (1) the documented restoration or (2) the date being reported on the table.

- These tables should be supplemented with detailed maps that identify the location of each pooling impact and the type and status of restoration.

## Stream Fracture/Heaving

- The typo “Frature” at the top of the 2018 and 2020 tables has been corrected to “Fracture”.

- The typo “Pamel ID” at the top of the 2018 and 2019 tables has been corrected to “Panel ID”.

- The following columns now grouped under “BUMIS Information” (are not *all* of these data from BUMIS?) are not informative or relevant to the public, only perhaps to DEP, and should be deleted: Fracture ID (I), Impact ID (J), Panel ID (K), Utility ID (L), and Utility # (M). If they have some relevance and should be retained, they need to be explained.

- A useful column that has been added is “Mining Type” (Column D; longwall, room-and-pillar, etc.)

- Two columns that would be useful and should be added are “Designated Uses” and “Existing Uses” pre-mining for each impacted stream segment.

- Two more columns that would be useful and should be added are “Depth to Mining” and “Mining Distance”, for each impacted stream segment, so that these tables are comparable to the others for Land Damage, Structures, etc.

- It is not clear how streambed Fracture/Heaving differs or is distinguished from Flow Loss. A column should be added to indicate whether all or part of a specific Fracture/Heaving impact overlaps geographically with either a flow loss or a pooling impact.



- Two other columns that would be useful and should be added are “Predicted? Y/N” which should be available from Module 8 in every permit application, and “Consistency with Prediction Length” (longer, shorter, same).
- A column should be added stating the days elapsed between undermining by the panel and observation of the fracture/heaving impact. Negative numbers would indicate days prior to undermining, positive numbers would indicate days since undermining.
- Another column that would be useful and should be added is “Date Restoration Began”.
- Another column that would be useful and should be added is “Status at Year End”, which could include descriptions such as restored, restoration ongoing, restoration not begun, other.
- Another column should be added to indicate the elapsed time from initial impact to either documented restoration or to the date being reported on the table.
- These tables should be supplemented with detailed maps that identify the location of each fracture/heave impact and the type and status of restoration.

## 5. STRUCTURES

Data are presented for 2018, 2019, 2020, and through 29 November 2021.

- All column headings need to be defined.
- **The column previously labelled “Time” has been clarified as “Time to [presumably Final] Resolution”.** The word “time” should probably be replaced by “days”, because that apparently is what the entries signify. Also, this duration should be measured from when the damage *occurred*, not when the DEP learned about it.
- The following columns are not informative or relevant to the public, only perhaps to DEP, and should be deleted: Problem ID (A), and Mine ID (F). If they have some relevance and should be retained, then the information being conveyed needs to be explained.
- All incidents of structure damage should immediately be reported, not only to the operator but to PADEP. Large gaps (more than 90 days) between when a problem occurred and when it was “received” (such as Problem ID 6238 in 2020, where the gap is 140 days) should be flagged, investigated by the PADEP, and explained in footnotes. There also should be a separate column for it in these tables (Days from damage to reporting to PADEP).
- Column B (Description) is unnecessary clutter, redundant, and not informative, inasmuch as all its entries are “structure damage” and this entire table is for Structure Damage. It would be better to

change the heading to “Type of structure”, and list such things as: dwelling, outbuilding, barn, church, etc.

- Another column that would be useful and should be added after “Mine Name” (G) is “Mine Type” (longwall, room-and-pillar, or pillar recovery), as now is done in most other tables.

- A separate column is needed to identify whether the impact was determined to be “*mine-liable*” or not (unless these tables list only those impacts which were determined to be mine-liable, in which case that should be explained up front).

- A column should be added stating the days elapsed between undermining by the panel and observation of the structure impact. Negative numbers would indicate days prior to undermining, positive numbers would indicate days since undermining.

**- A new column (J) “Description” [of the final resolution] has been added; this helps make these data more useful and also consistent with Act 54 reporting.**

- The relevance of Mining Depth (Column K) is not clear. Impacts in 2020 occurred where depths range from 220 to 1,000 (feet, presumably, that should be made clear). Depth of mining beneath the impact site might be significant, but without further analysis, such as comparing it with other factors such as distance to mining and time to resolution, by itself it is confusing at best. This is a good example of the value of the 5-year Act 54 assessments, which provide more context, additional analyses, and useful explanation.

**- Column L has been renamed to make clear it is the “Distance to Nearest Mining”.** Presumably it is the horizontal distance across the land to the nearest vertical shadow area of a longwall panel -- if not, what? And are the entries in “feet”? This should be clarified.

**- The column “RPZ” has been deleted. This is appropriate, inasmuch as the 5<sup>th</sup> Act 54 Report, and the Act itself, discuss an RPZ only in relation to water supply impacts.**

- The location of each structure issue should be identified by latitude/longitude.

- These tables should be supplemented with detailed maps that identify the location of each structure impact and the resolution status.

## 6. UTILITIES

- It’s not clear why this category is included at all. Damage to utilities is not specifically mentioned in Act 54. The general public is not particularly concerned about damages to (public/private?) utilities, unless it directly affects their service. These impacts appear to be very uncommon (one in 2018, one in 2019, and none in 2020 or 2021); might they better be combined with “structures”?

- Why include columns for Problem ID # (Column A) and Mine ID # (Column F)? These are not informative or relevant to the public, only perhaps to DEP, and should be deleted. If they have some relevance and should be retained, then the information being conveyed needs to be explained.
- Column B (Description) is unnecessary clutter, inasmuch as all of the entries are “Utility”, but that should be obvious because the tables in this group all are “Utility”.
- Column C has been renamed from “Description” to “Nature of Damage”, which is more informative.
- A column that would be useful and should be added after G (Mine Name) is “Mine Type” (longwall, room-and-pillar, or pillar recovery).
- A new column (J) “Description” [of the final resolution] has been added; this helps make these data more useful and also consistent with Act 54 reporting. (Note: both utility impacts were repaired.)
- A separate column is needed to identify whether the impact was determined to be “*mine-liable*” or not (unless these tables list only those impacts which were determined to be mine-liable, in which case that should be explained up front).
- The column previously labelled “Time” has been clarified as “Time to [presumably Final] Resolution”. The word “time” should probably be replaced by “days”, because that apparently is what the entries signify. Also, this duration should be measured from when the damage *occurred*, not when the DEP learned about it.
- A column should be added stating the days elapsed between undermining by the panel and observation of the utility impact. Negative numbers would indicate days prior to undermining, positive numbers would indicate days since undermining.
- The column “RPZ” has been deleted. This is appropriate, inasmuch as the 5<sup>th</sup> Act 54 Report, and the Act itself, discuss an RPZ only in relation to water supply impacts.
- The location of each utility issue should be identified by latitude/longitude.
- These tables should be supplemented with maps that identify the location of each utility impact and the status of its resolution.

## 7. WATER CONTAMINATION

Data for water supply contamination are presented for 2018, 2019, 2020, and through 29 November 2021.

- All column headings need to be defined.

- The column previously labelled “Time” has been clarified as “Time to [presumably Final] Resolution”. The word “time” should probably be replaced by “days”, because that apparently is what the entries signify. Also, this duration should be measured from when the damage *occurred*, not when the DEP learned about it.

- All incidents of water contamination should immediately be reported, not only to the mine operator but to PADEP. According to the introductory description for Water Loss, *“If the water user or owner believes their water has been affected by mining, they must contact the mine operator. The operator will then report to the Department within 24 hours.”* This often appears to be the case, but not always. Large gaps between when a problem occurred and when it was reported to the Department, or “received” (such as Problem ID 6333 in 2020, where the gap is 75 days, or Problem ID 6473 in 2021, where the gap is 1,101 days) should be flagged, investigated by the PADEP, and explained. There also should be a separate column for it in these tables (Days from damage to reporting to PADEP).

- A separate column is needed to identify whether the impact was determined to be “mine-liable” or not (unless these tables list only those impacts which were determined to be mine-liable, in which case that should be explained up front).

- The following two columns are not informative or relevant to the public, only perhaps to DEP, and should be deleted: Problem ID (A), and Mine ID (F). If they have some relevance and should be retained, then the information being conveyed needs to be explained.

- Column B (Description) is unnecessary clutter, redundant, and not informative, inasmuch as all its entries are “water contamination” and this entire table is for Water Contamination. It would be better to change the heading to “Type of water supply”, and list such things as: well, spring, pond, etc.

- Column C has been renamed from “Description” to “Nature of Damage”, which is more informative.

- A column that would be useful and should be added after “Mine Name” (G) is “Mine Type” (longwall, room-and-pillar, or pillar recovery).

- A column should be added reporting whether the impact was predicted (“Predicted? Y/N”) according to Module 8 of the permit application.

- A new column (J) “Description” [of the final resolution] has been added; this helps make these data more useful and also consistent with Act 54 reporting.

- A column should be added stating the days elapsed between undermining by the panel and observation of the water contamination impact. Negative numbers would indicate days prior to undermining, positive numbers would indicate days since undermining.

- What is the relevance of Mining Depth (Column K), and how is it measured (depth from ground surface, depth from bottom of well)? Impacts in 2020 occurred where depths ranged from 135 to 1,024 (feet, presumably). Depth of mining might be significant, but without further analysis, such as comparing it with other factors such as distance to mining and time to resolution, by itself it is

confusing at best. This is a good example of the value of the 5-year Act 54 assessments, which provide context, additional analyses, and useful explanation.

- **Column L has been renamed to make clear it is the “Distance to Nearest Mining”.**

Presumably it is the horizontal distance across the land to the nearest vertical shadow area of a longwall panel -- if not, what? And are the entries in “feet”? This should be clarified.

- The location of each water contamination issue should be identified by latitude/longitude.

- These tables should be supplemented with detailed maps that identify the location of each water contamination impact and the status of resolution.

## 8. WATER LOSS

Data for water supply loss are presented for 2018, 2019, 2020, and through 29 November 2021.

- All column headings need to be defined.

- All incidents of water supply loss should immediately be reported, not only to the mine operator but to PADEP. According to the introductory description for Water Loss, *“If the water user or owner believes their water has been affected by mining, they must contact the mine operator. The operator will then report this to the Department within 24 hours.”* This often is the case, but not always. Large gaps (more than 90 days) between when a problem occurred and when it was reported to the Department, or “received” (such as Problem ID 6210 in 2020, where the gap is 731 days, or Problem ID 5745 in 2018, where the gap is 2,929 days [8 years, 7 days]) should be flagged, investigated by the PADEP, and explained in footnotes. There also should be a separate column for it in these tables (Days from damage to reporting to PADEP).

- The following two columns are not informative or relevant to the public, only perhaps to DEP, and should be deleted: Problem ID (A), and Mine ID (F). If they have some relevance and should be retained, then the information being conveyed needs to be explained.

- Column B (Description) is unnecessary clutter, redundant, and not informative, inasmuch as all its entries are “water loss” and this entire table is for Water Loss.

- **Column C has been renamed from “Description” to “Nature of Damage”, which is more informative.**

- A column that would be useful and should be added after “Mine Name” (G) is “Mine Type” (longwall, room-and-pillar, or pillar recovery).

- A separate column is needed to identify whether the impact was determined to be “mine-liable” or not (unless these tables list only those impacts which were determined to be mine-liable, in which case that should be explained up front).

- A column should be added reporting whether the impact was predicted (“Predicted? Y/N”) according to Module 8 of the permit application.

- **The column previously labelled “Time” has been clarified as “Time to [presumably Final] Resolution”.** The word “time” should probably be replaced by “days”, because that apparently is what the entries signify. Also, this duration should be measured from when the damage *occurred*, not when the DEP learned about it.

- A column should be added stating the days elapsed between undermining by the panel and observation of the water loss impact. Negative numbers would indicate days prior to undermining, positive numbers would indicate days since undermining.

- **A new column (J) “Description” [of the final resolution] has been added; this helps make these data more useful and also consistent with Act 54 reporting.**

- What is the relevance of Depth to Mining (Column J), and how is it measured (depth from ground surface, depth from bottom of well)? Impacts in 2020 occurred where depths ranged from 100 to 938 (feet, presumably). Depth of mining might be significant, but without further analysis, such as comparing it with other factors such as distance to mining and time to resolution, by itself it is confusing at best. This is a good example of the value of the 5-year Act 54 assessments, which provide more context, additional analyses, and useful explanation.

- **Column L has been renamed to make clear it is the “Distance to Nearest Mining”.** Presumably it is the horizontal distance across the land to the nearest vertical shadow area of a longwall panel -- if not, what? And are the entries in “feet”? This should be clarified.

- The location of each water loss issue should be identified by latitude/longitude.

- These tables should be supplemented with detailed maps that identify the location of each water supply loss impact and the status or resolution.

## 9. WETLANDS

**Some [pre-mining, presumably, but that should be made clear] data are presented for 2018, 2019, 2020, and through July 2021. This is a major positive change from just seven months ago when no wetland data were provided in these Act 54 Yearly Data updates.**

- It is unclear which wetlands are presented in these tables – all of the wetlands undermined in a given year or only those for which the 5-year renewal data were available?

- All of the wetland data are highly suspect. There is no indication that the delineation of any wetland listed was ever reviewed in the field by a qualified expert from any agency (Corps of Engineers or PADEP), either prior to mining or post-mining.
- A new column should be added after Column A (Wetland Number) and be labeled “Pre-Mining Wetland Type” (if that is what it is). It should be populated with the relevant wetland symbol for the major Cowardin wetland class (PEM, PSS, PFO, PUB).
- Many entries in Column D (Year Surveyed) are blank, and many others provide a range (e.g., 2011-2014). This column should be renamed “Date of Original Delineation”, and the exact date should be provided (this information is available from the mine permit application). The date is important, in part, because it provides information about the season when the delineation was performed.
- Column E (Year Mined) should be placed after Column I (Panel).

## **Appendix C.**

**Citizens Advisory Council  
Consolidated Comments on  
“The Effects of Subsidence Resulting from  
Underground Bituminous Coal Mining, 2013-2018”**

(Advertised public hearing on 8 April 2021)

I. Public Comments

**1. General Comments**

i. Form letter from approximately 950 commenters:

1. Commenters wrote to voice concern about the damaging process of longwall coal mining. Given that DEP's own studies show that this process of coal mining is responsible for 99% of recent stream damage from mining in southwestern Pennsylvania, it's time to halt this harmful form of fossil fuel extraction in the state. Longwall mining should never be allowed under our streams, and companies that damage our waterways beyond repair must no longer be allowed to practice this kind of mining activity in the state.

ii. Joseph Pizarchik, Pizarchik Advancements

1. The first 5 Year report documents there were 14 adverse stream impacts that occurred that 5 year period caused by underground mining. During the 2013-2018 period there were 183 documented adverse stream impacts. All caused by longwall mining. The number of documented adverse stream impacts have increased 1,300% over the past 25 years. The coal company and DEP predictions have gotten worse not better. From 2013- 2018 44% of stream miles undermined by longwall mining were damaged. Longwall mining caused flow loss 153 times. The facts document that it is not possible to accurately predict flow loss impacts of proposed longwall mining. DEP should stop issuance of permits to longwall mine beneath streams.

iii. Faith Zerbe, Pennsylvania Campaign for Clean Water

1. The 5th Act 54 Report clearly demonstrates that the Department has been allowing groundwater, streams, wetlands, and other water resources to be damaged by coal mine subsidence in violation of the Clean Streams Law (CSL), which Act 54 of 1994 explicitly stated that it did not supersede. Most of the documented aquatic resource damage is not predicted in advance, and most is associated with longwall mines. However, CCWEV is concerned that room-and-pillar (R&P) mines also may be causing water resource damage which is not being documented (or predicted) because the Department does not require the same collection and monitoring of stream data for most R&P mines. We urge the Department to require that all damages to streams and other water resources be predicted and avoided, especially in and near Special Protection streams which require stronger protections under the Clean Water Act. No predicted damage (whether temporary or permanent) should be allowed in any Special Protection water.



Furthermore, if unpredicted stream damages occur in any Special Protection water, then the Department must impose significant fines and suspend mining until the stream has been fully “restored” to pre-mining conditions.

- iv. Aimee Erickson, Citizens Coal Council
  - 1. The 5th Act 54 Report clearly demonstrates that the Department has been allowing groundwater, streams, wetlands, and other water resources to be damaged by longwall mine subsidence in violation of the Clean Streams Law (CSL), which Act 54 of 1994 explicitly stated that it did not supersede.
- v. Kelly Germann, Tincum Conservancy
  - 1. Based upon the Department’s own Act 54 report, documented repairs to subsidence-damaged homes and water supplies are rare. The Act 54 Report cites damage from longwall mining that has caused widespread and long-term pollution to surface waters and groundwater resources in Washington and Greene counties.
  - 2. As you are aware, longwall mines are overwhelmingly responsible for all damages caused by underground bituminous coal mining. During the 5th Act 54 period, 95 percent of all damages (and 100% of all stream damages) were attributed to longwall mining.
  - 3. Additionally, over the 25-year period covered by the five Act 54 Reports, there have been 1,427 structure damages (94 percent due to longwall mining), and 1,726 water supply damages (67 percent due to longwall mining). Only a meager percentage (less than 6 percent in the 5th period) of all damages to structures and water supplies have been documented as having been repaired.
  - 4. I ask the CAC to call on the Department to enforce its regulations and the laws that apply to longwall mining operations, including the Clean Streams Law. The health of our environment, water resources, and lands are at stake. The Department must fulfill its constitutional obligations under Article 1, Section 27 of the Pennsylvania Constitution: stop the pollution of our streams; stop the destruction of our natural, scenic, historic, and esthetic values of our environment. A stream without water is just a dry ditch.
- vi. Rachel Gleason, Pennsylvania Coal Alliance
  - 1. The prevention of subsidence was not the premise of Act 54. Rather, the objective was to provide for procedures and processes to address impacts. Act 54 was as much about balancing the property rights of the mineral estate holder with those of the surface landowner as it was about addressing the environmental impacts of underground mining. To divorce these two objectives would be to misstate the genesis of the law, and the legislature made the conscious public policy decision to balance these

competing ownership interests more than they had been in the past. Therefore, in determining whether the Act's implementation is consistent with legislative intent, the report needs to evaluate industry's response to reported claims of subsidence, and if those claims are being responsibly resolved by operators.

2. The coal industry is perhaps one of the most transparent in the Commonwealth, and Pennsylvania's operators endure scrutiny and comply with standards not seen in neighboring Appalachian states. Nevertheless, industry continues to welcome collaboration with DEP to finding better ways to identify mining-induced impacts, improve methodologies, and improve data collection. The 1994 amendments to the Bituminous Mine Subsidence and Land Conservation Act that were signed into law as Act 54 were implemented as the solution for balancing the rights of the landowner and coal operator, and while Act 54 did not create a blanket subsidence prevention standard, neither did it allow operators to undermine with impunity. It was designed to allow these two interests in land to coexist. Within this context, PCA believes that the 2013-2018 Report on the Effects of Subsidence Resulting from Underground Bituminous Coal Mining in Pennsylvania confirms that the law continues to work as intended. Thank you in advance for the opportunity to provide perspective on the Report.

vii. Sierra Club, Pennsylvania Chapter

1. The latest five-year report clearly shows that mining companies are avoiding their responsibility to communities, and it is incumbent upon DEP to enforce the law and hold them accountable. To do so, DEP must:
  - a. correct deficiencies in assessment of pre-mining conditions. This includes documentation of water quality monitoring during longwall permit renewals;
  - b. use higher frequency groundwater monitoring, especially right before and right after undermining, in order to accurately measure impacts and hold companies accountable;
  - c. stop ignoring the negative community impacts of widespread property buyouts, which lead to population decline and disinvestment;
  - d. exercise its authority through enforcement to ensure mitigation methods are fixed promptly and not dragged out over years after mining stops;

- e. clearly document the time between identification of mining-related damage and final resolution of that damage; and
  - f. not renew, expand, or update mining permits when the operator has any outstanding impacts that have not been addressed.
- viii. Aida Shotts, League of Women Voters
1. There are alternatives to long wall mining to remove coal from the ground. We have increasingly fewer options left to thwart the well-documented, scientifically predicted catastrophic outcomes of the failure to protect our environment and prevent pollution. Remediation and mitigation, as promulgated by Act 54, will deny future generations of the clean air, pure water, and natural resources needed to sustain life.

**2. *Flow Loss/Augmentation***

- i. Joseph Pizarchik, Pizarchik Advancements
  1. The 5th Act 54 report documents multiple longwall mines caused multiple flow loss to the same stream by multiple panels (6 times by Bailey Mine, 3 times by Cumberland Mine, once by Emerald Mine, 7 times by Enlow Fork Mine, once by Harvey Mine, & twice by Monongalia Mine). This data documents 20 instances where the mining company and DEP had actual evidence longwall mining had caused pollution/flow loss to multiple streams but they both proceeded to again damage/pollute the stream a second time. All twenty instances violated the Clean Streams Law and the coal mining regulations. These twenty violations document that longwall mining should not be authorized beneath streams.
  2. It is unacceptable that DEP has not used its legal authority to modify the permit to prevent repeated flow loss damage to the same stream. Years ago DEP used this authority to modify the permit and prevent UMCO from causing another flow loss at the High Quality Mine. That commendable DEP action was upheld by the courts. DEP should resume protection of streams from a second flow loss as it has done and should do. Alternatively, DEP can prevent stream destruction/pollution by not authorizing longwall mining within 2,000 feet of a stream.
  3. The Bituminous Mine Subsidence Land Control Act, the Clean Streams Law and PA Code Chapters 86 & 89 are part of DEP's approved regulatory program. The above cited actions by DEP are violations of its federally approved program. DEP's repeated failure to implement its approved program could result in the

- federal Office of Surface Mining Reclamation and Enforcement taking over all or part of Pennsylvania's coal mining program.
4. The University of Pittsburgh (University) recommendation number 16 states DEP should determine the cause of far-field effects (far-field effects are surface damage such as stream flow loss, etc., that occur up to 2,000 feet from the longwall mining), assess if current policies are sufficiently protective, and decide if policies need to be altered to ensure protection from far-field effects. After more than 25 years of experience DEP stated it is unable to predict where and/or when longwall mining caused far-field movements/damage will occur, DEP is unable to conduct research into these specific damage events, and DEP does not have the resources to do so. DEP is dependent on the PA General Assembly for the resources necessary to properly implement its mining program. The 2013-2018 Act 54 report documents far-field effects occur with alarming frequency and cause serious damage. The inability of DEP to predict far-field effects after 25 years of experience and the General Assembly's repeated failure to provide DEP the resources to properly do its job, are additional reasons for DEP to not authorize longwall mining within 2,000 feet of a stream.
  5. University recommendation #17 DEP limit the practice of stream flow augmentation with water withdrawn from another stream to avoid harm to the other stream. The DEP response to is unacceptable. DEP action to recommendations should not be limited to it will review the recommendation when it reviews the current stream protection guidance. DEP has the legal authority to prevent mining companies from destroying a stream by water augmentation withdrawals to use that water to restore flow to a stream where the company's longwall mining has already killed the critters by elimination of stream flow. Two wrongs do not make a right, it just doubles the stream damage. DEP can act immediately to stop the carnage by not authorizing longwall mining beneath streams and by stopping the double calamity of flow augmentation withdrawals.
  6. University recommendation #20 is for DEP to re-evaluate the pre-mining daily monitoring specified in TGD 563-2000-655 because adverse stream impacts (heaving and fracturing) occur up to six weeks in advance of undermining of the stream (the report also documents these far-field effects occur up to 2,000 feet in advance of longwall mining). DEP's response to reconsider the pre-mining daily monitoring guidance appears to be, at best, a delay tactic. DEP has the legal authority to modify the permits to specify

premining daily monitoring must begin six weeks before the stream will be undermined or DEP can modify the permits to withdraw authorization to mine within 2,000 feet of a stream in order to prevent flow loss. 8. University recommendation #23 notes that coal companies do not follow the stream monitoring standards contained in the guidance. The DEP's response that these substantial stream monitoring deviations due to holidays and hunting season are acceptable as long as the longwall mine operator explains the failure to monitor the stream is a dereliction of duty. Holidays and hunting seasons are not a reasonable basis for the coal company's failure to comply with the law and permit. DEP is a regulator, not a holiday part planner or hunting recreation promoter. It is DEP's responsibility to implement the mining program or not authorize longwall mining within 2,000 feet of a stream.

7. DEP's response to University recommendation #24 to require access to all streams be acquired prior to undermining in order to enable timely stream flow augmentation is not responsive even though DEP asserts flow loss is an unanticipated adverse impact. If the 153 flow loss impacts the past five years were all "unanticipated impacts" then permits should not authorize longwall mining within 2,000 feet of a stream. If the 153 flow loss impacts were anticipated, then DEP clearly is not implementing its approved program.
  8. DEP's response to University recommendation #27 that DEP evaluate the 5 year stream restoration period is not responsive. It is now very clear, 5 years is not temporary. Due to the numerous restoration time periods that have exceeded 5 years since the guidance was implemented confirms that flow loss is not a temporary inconvenience for the fish and other aquatic critters. DEP should use its legal authority to rescind its authorization and not authorize any longwall mining within 2,000 feet of a stream because neither DEP nor the mining companies can accurately predict stream flow loss nor far-field effects.
  9. DEP's response to University recommendation #28 is contradicted by the facts. DEP should follow the law and enforce the permit to prevent destruction of the aquatic community.
- ii. Aimee Erickson, Citizens Coal Council
1. The Department allows widespread and long-term damages to streams and other water resources, without consequences, under the pretense that "permanent" damage is not being "predicted". The Department's 5th Act 54 Report clearly demonstrates that almost 50% of streams undermined by longwall mines suffered

either flow loss or pooling damage, and that 90% of the stream-mile damages that occurred were flow loss. Of all stream damage incidents reported over the 25-year period covered by the Department's five Act 54 Reports, 99% were attributed to longwall mining. Although there is no model to predict flow loss, sophisticated prognostic tools are not needed to recognize that stream damage is very likely to result from longwall mine subsidence. Furthermore, the lack of a model does not excuse the Department from neglecting its legal obligations under the CSL or its Trustee obligations under the Pennsylvania Constitution to enforce against destruction of streams in the Commonwealth.

- a. The Department must develop, or require longwall mine operators or others to develop, a model that will accurately predict where and how much flow loss damage will occur before authorizing panels near streams. The Department must issue no new mine permits, permit revisions, or permit renewals for longwall mining beneath or near any streams until such a model has been developed and is in use.
- b. Absent a model to accurately predict flow loss, the Department must presume that stream damage will occur unless a longwall mine applicant conclusively demonstrates that damage will not occur.
- c. "Peng model", used to predict highly likely incidents of major subsidence-related pooling in streams, was developed more than 25 years ago. The Department must reevaluate this model's accuracy in light of modern longwall mine dimensions and techniques and insist upon any warranted revisions.
- d. The Department must draw upon academic and agency expertise and upon actual documentations of biological stream recovery to ascertain the significance of pooling shallower than 1 foot and reduce this current threshold of "allowable impact" if warranted.
- e. Flow loss or pooling damages that occur other than as predicted should be designated by the Department as violations of the Clean Streams Law and treated accordingly.
- f. The Department should make sure that all stream segments where designated uses are not being attained because of flow loss or pooling as a result of underground coal mining are accurately shown on the Clean Water Act 303/305 lists of impaired streams that are updated every three years.

2. The Department has been allowing damages to streams and other water resources under the pretense that longwall subsidence damages will be temporary, not permanent, and that the streams can be fully restored to their pre-damaged condition. The Department's Bureau of Mining Programs has no regulatory definition of "temporary" stream damage, although its 2005 TGD 563-2000-655 (entitled "Surface Water Protection – Underground Bituminous Coal Mining Operations") suggests that restoration of damaged streams should occur within 3 years, and should not exceed 5 years. The Department's 5th Act 54 Report demonstrates that stream pooling damages examined during the 2013-2018 review period required nearly 8 years on average to be restored (the longest was nearly 14 years), that 81% of pooled streams remained damaged longer than 5 years before release by the Department, and that 44 streams that had previously suffered flow loss remained damaged longer than 5 years, 11 of them longer than 10 years, some as long as 15 years. Six streams in 2012 were declared irreparably damaged by the Department, yet the mine operators have not been fined or otherwise held to account in accordance with the CSL.
  - a. The Department's Bureau of Mining Programs must establish a formal definition of "temporary" impact, i.e., a definitive threshold for the time between allowed stream damage and full restoration of stream flow and biology, based on scientific research and informed by the requirements of the Clean Streams Law 3 and its Constitutional Trustee obligations. Beyond that time threshold, mine operators must be held accountable for violations of the Clean Streams Law. The CCC recommends that the threshold be 2 years.
  - b. The Department must increase the recording and reporting of hydrological data prior to and following longwall (as well as room-and-pillar) undermining of streams, inasmuch as the Department's TGD recommendations are not being followed and data are not being collected that would support adequate analysis of hydrological impacts. - The TGD currently allows up to a 12% reduction in the mean pre-mining total biological score (TBS) of a stream reach damaged by longwall subsidence (even for Special Protection waters). The basis for that threshold is not clear, so the Department must reexamine it (and change it if necessary) based on current scientific research and expertise. The 5th Act 54 Report documents that only 4%

of all mine-liable structure impacts and only 7% of all mine-liable water supply damages were definitively resolved by repair or restoration. Negotiated (usually non-disclosure) agreements and company purchase of damaged properties were the documented resolution in 88% of all cases. Not only is this contrary to the “you break it – you fix it” promise that Act 54 supposedly established, but such agreements are inherently unjust because coalfield residents are at a distinct disadvantage in lengthy, costly, and complicated negotiations with mine operators.

- c. The Department must commit to clearly identify the final resolution of all mine-liable damages to structures and water supplies as either “repaired” or “not repaired” (in addition to any other category the resolutions may fit into). The accuracy and adequacy of the data used to assess the effects of subsidence in the Department’s latest 5-year Act 54 Report, as in previous ones, has been repeatedly questioned, even by the University researchers who assembled and presented those data under contract to the Department. Although the Report contains a significant amount of useful information, it also presents data and conclusions that are unclear, inconsistent, misleading, or simply inaccurate (see Appendix B in the attached 2021 CCC report). The Department initially resisted our researchers’ attempts to obtain underlying data used in the Act 54 evaluations and analyses, in order to try to replicate the findings. When we ultimately received some of the requested data, they clearly were incomplete and, in some cases, raised more questions than they answered. - Accurate information from permit applications too often does not get carried through to Act 54 reports. This presumably is at least in part a consequence of the Department’s inadequate recordkeeping software.
- d. Like CCC, the CAC itself has long urged the Department to be more transparent and to provide greater public access to the information and databases used in the preparation of its Act 54 assessments, and to augment the collection of essential data routinely overlooked. We urge the CAC to continue to push for such access, which is especially important when the reported data appear to be internally inconsistent or contradictory. Public confidence in the Department’s data and analyses is crucial, but currently is



weakened by the deficiencies and contradictions highlighted in the Department's Act 54 reports.

iii. Rachel Gleason, Pennsylvania Coal Alliance

1. A stream recovery evaluation (SRE) report is submitted by a mine operator following mitigation on an impacted stream to demonstrate recovery of the stream and to demonstrate flow has returned to pre-mining ranges and release the operator from any further monitoring and restoration obligations. In Section 7 of the 2013-2018 Report on the Effects of Subsidence Resulting from Underground Bituminous Coal Mining in Pennsylvania, the University of Pittsburgh discusses the defined schedule for flow monitoring, and erroneously referenced the SRE reports to critique the adherence to the schedule. PCA believes that the University does not comprehend the purpose of an SRE. SRE protocol is used to compare pre-mine and post-restoration flow data. The SRE report is not a flow loss incident investigation, but rather a comparative analysis between post-restoration and baseline (pre-mine) range in conditions. The University did not consider the stream monitoring frequency specified in TGD 563-2000-655, which is currently followed and adhered to by operators. Specifically, the monitoring plan includes flow measurements at representative stations weekly commencing six months prior to undermining, daily commencing two weeks prior to undermining, weekly continuing six months after the conclusion of daily monitoring, and corresponding measurements of flows in control streams.
2. As previously discussed, a SRE report is submitted by a mine operator following mitigation on an impacted stream to demonstrate recovery of the stream, to demonstrate flow has returned to pre-mining ranges, and to release the operator from responsibility for continued stream repair. While development of the SRE template was a positive step towards establishing a consistent framework for submitting requests, PCA operators would like to see more timely responses to these requests from DEP. Further, the University's assessment that 183 stream impacts have not yet had an SRE report submitted is misleading and underscores the incomprehension of the purpose of the SRE reports, as many of the streams are in the monitoring phase and therefore submission of a SRE report would be premature. Similarly, when evaluating biological release, the University consistently overlooks external factors, such as the time it takes to adequately assess an impact, develop/refine a restorative solution, prepare and obtain the necessary state and federal permits, obtain

landowner permission required to perform the remedial work, and DEP SRE report review. When addressing gate cuts, once the work is complete, additional time is needed to assess and document biological and hydrological recovery from the restoration activities. Based on the 2017 SME manuscript, the median recovery time for streams that required intervention is 1.7 years after work has been completed.<sup>7</sup> The DEP's biological release does not occur until after the SRE report has been prepared and submitted by the operator, and reviewed by DEP, which inaccurately adds considerable time onto what the University perceives to be a stream's recovery timeline. Further, the previously referenced 2017 study by Nuttle et. al. focused on 18 gate cut sites on streams in the Enlow Fork and Bailey Mine areas and found that following restoration, total biological score (TBS) and macroinvertebrate taxa richness increased to the point that there was not a statistical difference between pre-mining and post-restoration samples. In fact, some post-restoration TBS were higher than pre-mining scores, which is supported in the Report (page 9-11), potentially due to the restoration design incorporating instream structures for grade control, bank stabilization, and habitat. Almost all of restoration sites in the Nuttle et al. study were monitored at least four times for six-month intervals within the first two years following restoration. Therefore, these study results indicate that prolonged biological recovery time was not the major cause for average release times approaching 7 years, 11 months as stated in the report. Lastly, it is appreciated that the University accurately reported the actual length of flow loss and pooling, rather than reporting total stream lengths as was done in the 4th Act 54 report.

3. The University recommends that the stream restoration time period of five years be evaluated. As previously discussed, the five-year time frame allows adequate time to assess an impact, develop/refine a restorative solution, and prepare and obtain the necessary state and federal permits and landowner permission required to perform the remedial work, when required. It also allows time to assess and document biological and hydrological recovery from the restoration activities. In addition, recovery monitoring occurs across a minimum of 24 continuous months, and streams experiencing flow loss are provided augmented flow so that the biological and hydrological functions of the stream are maintained while plans for restoration activities are established, approved, and implemented. Shortening this timeframe could result in hurried efforts that do not adequately address an impact,

lead to increased recovery time due to inefficient restoration (e.g. bedrock permeation grouting performed during winter months that could potentially result in additional restoration efforts), and may lead to temporal loss of the biological community.<sup>8</sup> Furthermore, due to varying conditions unique to each impact, research suggests various recovery time periods following longwall mine subsidence (Dixon and Rauch, 1990; Carver and Rauch, 1994; Gill, 2000).<sup>9</sup> Common to these researchers are underground mine locations, streams, field measurement techniques and methodology of hydrologic data analysis. In addition, the University recommends the Department consider whether additional accuracy in the determination of undermined stream mileage is warranted, and suggested the Department consider defining a DEM resolution and flow accumulation threshold to identify streams that are not included in the "Networked Streams of PA" layer. However, this would be duplicative, as the pre-mining stream extents, as determined using the TGD 563-2000-655 Appendix A methodology, are provided on the environmental resource maps included in the permit application which identifies all stream extents within the permit area, not just those included in the "Networked Streams of PA" layer. The University also recommends that PADEP and mine operators coordinate with Pennsylvania Fish and Boat Commission to inventory stream fish fauna and water quality as part of the Unassessed Waters Initiative, or other quantitative surveys, before and after such streams are undermined. However, this would also be duplicative, as TGD 563-2000-655 requires the submission of baseline information on fish and macroinvertebrate communities sufficient to delineate intermittent and perennial streams and the segments of those streams that qualify as "biologically diverse" and "biologically variable." Fish sampling is typically performed on perennial stream reaches, as steeper gradient, shallow headwater streams are not conducive to fish sampling using electrofishing methods

### ***3. Stream, wetland, and groundwater delineation***

#### ***i. Faith Zerbe, Pennsylvania Campaign for Clean Water***

- 1. The 5th Act 54 Report clearly demonstrates that the Department is not consistently requiring accurate delineations of streams, wetlands, and groundwater resources in mine permit applications or renewals. We urge the Department to insist on accurate delineations of the regulated limits of all streams and wetlands on and above every mining site in all permit applications. As CAC recommended after the 4th Act 54 Report, the Department should***

routinely require applicants to have their delineations verified by Corps of Engineers jurisdictional determinations [JDs] at no cost to the Commonwealth.

- ii. Aimee Erickson, Citizens Coal Council
  - 1. Although most documented water resource damages are associated with longwall mining, the Department does not require the collection and reporting of the same type and amount of pre-mining inventory for streams and other water resources above room-and-pillar (R&P) mines; therefore, it is likely that similar damages are occurring from R&P mines but that damage simply is not being documented.
  - 2. The Department must require the same detailed pre-mining environmental inventory and monitoring for all underground bituminous coal mines.
  - 3. Where pre-mining delineations of groundwater, streams, wetlands, and other water resources are being required, the Department has failed to ensure that those delineations are accurate or adequate. By not adequately identifying the water resources at risk from proposed underground mining activities, the Department cannot credibly protect or preserve them in accordance with its Constitutional trust obligations and statutory directives.
- iii. Rachel Gleason, Pennsylvania Coal Alliance
  - 1. The University cites inconsistencies among wetland data, which after evaluation appear to be in relation to how the wetland boundaries were delineated. In 2012, the 1987 Corps of Engineers wetland delineation methodology was revised to include regional supplements with additional delineation criteria. Due to the timing of the assessment for the Report, it is likely that situations occurred where the pre-mine data was collected using the 1987 Corps of Engineers Manual and the post-mine data was collected using the 2012 regional supplements. This change was likely an effort to use the most current protocols and not a reflection of a lack of quality control.

#### ***4. Special Protection Waters***

- i. Faith Zerbe, Pennsylvania Campaign for Clean Water
  - 1. There is no evidence in this, or previous, Act 54 Reports that the Bureau of Mining Programs makes any distinction between the undermining of Special Protection waters and the undermining of non-Special Protection waters, and that is especially concerning to us. In light of the fact, as documented in the 5th Act 54 Report, that about 44% of the streams undermined by longwall mines are being damaged in some way (either by flow loss or pooling), we

are extremely concerned with the high probability of damage to Special Protection waters going forward. The failure for the Department to recognize this damage that has been documented is not acceptable.

2. The 5th Act 54 Report states that extraction from the remaining Pittsburgh coal seam will require approximately 40 years at current rates of mining. We understand that slightly more than half of the unmined Pittsburgh coal is located beneath and within watersheds that the Department has recognized and formally designated as Special Protection waters (those meeting Exceptional Value and High Quality uses). Thus, those Special Protection watersheds (and any others not yet recognized) increasingly will be subject to longwall mining pressure during the next four decades. Inasmuch as the use of coal and the pace of coal mining in Pennsylvania has declined in recent years in response to an imperative need to transition to renewable energy due to the catastrophic effects of climate change, the Department should make freshwater stream protection its highest priority when making mine permit decisions, in accordance with both the Clean Streams Law and its obligations under Article 1, Section 27 of the Pennsylvania Constitution.

## ***5. Enforcement***

### ***i. Joseph Pizarchik, Pizarchik Advancements***

1. DEP's response to University recommendation #29 is not consistent with the public hearing testimony of the coal industry representative provided on April 8, 2021. She stated the purchase of the property by the coal company was authorized by Act 54. If DEP is correct, then DEP should modify its report to the General Assembly to reflect that coal companies are purchasing property in order to avoid their Act 54 obligation to repair or compensate the homeowner for damages caused by longwall mining. Furthermore, DEP should ask the General Assembly to amend BMSLCA to close this loophole.
2. DEP's response to University recommendation #30 creates the impression that DEP has decided to shift its legal responsibility to oversee and enforce the hydrologic balance protection requirements to the public. DEP should specify in clear, concise language how DEP will use the information to implement the law.
3. The coal industry representative stated at the April 8, 2014 public hearing that Act 54 was a rebalancing of property rights. That may be true for private water supplies and for homes built before April 27, 1966. The industry representative statement is not accurate when it concerns streams. Streams are by law "waters of the

Commonwealth.” The coal companies do not have a property interest in streams. They have no legal right to destroy streams.

## **6. Reporting Requirements**

### **i. Rachel Gleason, Pennsylvania Coal Alliance**

1. The Bituminous Mine Subsidence and Land Conservation Act specifically states that while the Pennsylvania Department of Environmental Protection (DEP) shall analyze and compile data for the Report, the Department is not authorized to require a mine operator to submit additional information or data for the Report. With that in mind, since implementation of the Technical Guidance Document 563-2000-655 in October 2005, mine operators have worked in partnership with the DEP to continuously improve data collection methods and restoration techniques.<sup>4</sup> For instance, as documented in Silvis et al (2019), streambed grouting techniques have evolved to the current consolidation grouting technique that produces greater success and efficiency while minimizing disturbance.<sup>5</sup> Similarly, the gate cut designs have progressed from simple lowering the streambed and armoring the banks to more natural channel design techniques that incorporate instream structures, grade control, and riparian enhancement that are all geared toward protection of the environment. Operators frequently go beyond the regulatory requirements to restore impacts that result in better hydroecological stream conditions than observed pre-mining (Nuttle et al 2017).<sup>6</sup> It is through this process of continuous improvement and refinement that mining can be done responsibly. Further, Module 8 of an underground mining permit application contains the requisite hydrologic and geologic baseline data required of SMCRA. This is used to determine probable hydrologic consequences (PHC) to evaluate whether flow loss and/or pooling can be restored to baseline/pre-mine condition and not result in material damage to the hydrologic balance beyond the permitted area. Permit approval is based on minimization of hydrologic impact within the permitted area and prevention of off-site material damage to the hydrologic balance as required by the federal regulation. General performance standards in SMCRA are used to identify hydrologic objectives, but SMCRA does not prescribe PHC or the cumulative hydrologic impact assessment (CHIA) as methodologies to obtain specific criteria.

## Appendix D.

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April 9, 2021

Citizens Advisory Council  
Department of Environmental Protection  
Rachel Carson State Office Building,  
P.O. Box 8459  
Harrisburg, PA 17105-8459

**Re: Comments on 2013-2018 Effects of Subsidence Resulting from Underground Bituminous Coal Mining in Pennsylvania Report  
Noticed in 51 Pa.B. 241 (Saturday, January 9, 2021)**

Dear Citizens Advisory Council:

On behalf of Center for Coalfield Justice (“CCJ”) and its more than 3,000 members and supporters, please accept these comments on 2013-2018 Effects of Subsidence Resulting from Underground Bituminous Coal Mining in Pennsylvania Report (“Act 54 Report”). The undersigned organizations support these comments.

CCJ is a 501(c)(3) non-profit organization founded in 1994 by individuals organizing against the destruction caused by longwall coal mining. Since then, we have expanded our mission to work on issues related to extractive industries generally in Washington and Greene Counties. The organization’s mission is to improve policy and regulations for the oversight of fossil fuel extraction and use; to educate, empower and organize coalfield residents; and to protect public and environmental health. As such, and on behalf of our members and supporters, we are acutely aware of the subsidence-induced impacts caused by longwall coal mining and the need to adequately address those impacts. The largest underground coal mine complex in North America is located in Greene and Washington Counties.<sup>1</sup> The communities we serve have experienced first

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<sup>1</sup> Consol Energy’s Pennsylvania Mining Complex is the largest producing underground coal mining operation in North America. It consists of the Bailey, Enlow Fork and Harvey mines, along with a central preparation plant and train loadout facility. See <http://www.consolenergy.com/operations/pennsylvania-mining-complex>

hand the subsidence-induced damage to homes and other structures, water supplies, and streams described in the most recent Act 54 Report.<sup>2</sup>

#### I. Structure and Water Supply Impacts

It is critical to note immediately that changes in mining activity influenced the magnitude of subsidence impacts observed during the 5<sup>th</sup> assessment period. While the number of active mines has been fairly constant, the acres of coal mined has decreased by 24.5%. *See* Report at 3-5. The Act 54 Report concluded: “A decline in the acres mined has resulted in a decreased number of company liable water supply effects.” Report at 5-21.

During the 5<sup>th</sup> assessment, underground coal mining caused damage to at least 247 structures. Active longwall mines caused 92.7% (229) of the structure damage. *See* Report at 4-6. The Act 54 Report notes that the most common resolutions for company liable structure damage was “Unspecified Agreements” (125) and “Company Purchased Property” (76). *See* Report at Table 4-6. The Act 54 Report further states: “The most common final resolution category for longwall structures that were found to be company liable was an “Unspecified Agreement” (Table 4-10)... “Company Purchasing Property” was also a common resolution category.” Report at 4-10.

According to the Report, there were 177 reported water supply impacts from longwall mining that have reached a final resolution. “The most common company liable effect was an “Unspecified Agreement” (72; Table 5-8), which took an average of 492 days (Table 5-8)...There was also a large amount of company purchased properties for water supplies in the 5<sup>th</sup> assessment (54; Table 5-8).” Report at 5-12. There were an additional 56 reported water supply impacts from longwall mining that have not reached a final resolution and are still in interim resolution. It took an average of 441 days for those 56 reported effects to reach an interim resolution. *See* Report at 5-13, Table 5-9.

Act 54 and the Department’s underground coal mining regulations require that structures and water supplies impacted by underground coal mining be repaired or replaced. *See* 25 Pa. Code §§ 89.143a and 89.145a. But, what happens when mine operators purchase properties above their underground coal mining operations to

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<sup>2</sup> Greene and Washington Counties had the most mining activity during the 5<sup>th</sup> assessment period. *See* Report at E-2, E-3.



resolve subsidence impacts? The Act 54 Report acknowledges that this practice has the potential to adversely alter overlying communities. Report at 11-12 (“Mine operator purchases of properties above underground mining, including purchases to resolve subsidence impacts, have the potential to adversely alter overlying communities.”) The Act 54 Report explains:

The University noticed a high rate of subsidence impact resolution through company purchase of the impacted property. BUMIS reveals a substantial proportion of impacts are resolved through company purchase of the impacted property (n.b., BUMIS does not differentiate between purchases pre- and post-mining). Of the 192 water supply impacts that were deemed company liable, 54 of those cases were listed as resolved by operator purchase of the impacted property (Table 5-4). For comparison, 54 cases represent an increase in purchases compared to previous assessment periods (34 company purchases of water supply impacted properties in the 3rd assessment period and 37 during the 4<sup>th</sup> assessment period).

These rates of operator purchase inferred from impact reports do not capture the complete scope of company real estate acquisitions as part of mining. Figure 11-1 shows the extent of operator owned parcels over mining during the 5th assessment period in Harvey Mine. A substantial portion (more than 40 %) of land area over these longwall panels is owned by the mine operator. If these properties are impacted by subsidence during mining and the properties later sold “as-is”, these subsidence impacts can degrade the local tax base and negatively impact the local community. Demonstration of these processes are beyond the scope of the 5th Act 54 assessment but have the potential to create economic strain on communities living over active mines. This would require an analysis of the long-term economic strain beyond the scope of work for this report.

Report at 11-2; Figure 11-1. As coal companies address subsidence impacts by

purchasing property either before or after mining, more people move out of the area. The homes and water supplies located on those properties may never be repaired or replaced.

Figure 4-5 in the Act 54 Report shows the damage to a home that was undermined by the Enlow Fork Mine in 2015. The mine operator purchased this property 12 days before it was first undermined. *See* Report at 4-11; Figure 4-5. This home may never be repaired and will sit vacant until it is eventually demolished. The Act 54 Report reveals that there are many other impacted homes like the one pictured in Figure 4-5. Coal operators also purchased 54 properties in order to resolve water supply impacts during the 5<sup>th</sup> assessment period. The values of those properties are severely diminished unless and until the operator replaces each of those water supplies with permanent replacement supplies. Report at 11-2.

Figure 4-6 in the Act 54 Report shows an example of structural damage to the interior of a home from the Bailey Mine in 2013. The main support beam of the house twisted and a bump was observed in the first-floor hallway. The property owners entered into an unspecified agreement with the company for these damages. *See* Report at 4-12; Figure 4-6. In other words, we don't know whether that unspecified agreement provided the property owner with sufficient funds to repair the house or whether the home was ever actually repaired. 25 Pa. Code § 89.143a requires the operator to fully repair the damage to a structure or compensate the owner for the reasonable cost of repairing or replacing the damaged structure. Landowners and coal operators almost always disagree about the "reasonable cost" of repair or replacement during post-mining negotiations. Not surprisingly, coal operators often underestimate the cost of repair or replacement.

The 2020 Greene County Comprehensive Plan<sup>3</sup> provides a better understanding of the negative impacts to the local community previewed in the Act 54 Report. *See* Report at 11-2. Greene County saw the most underground coal mining activity during the last two assessment periods. The 2020 Greene County Comprehensive Plan recognizes that the County has experienced a decline in the overall population and an increase in the median age. *See* Comprehensive Plan at 19, 22. Greene County has also experienced a dramatic decreased in school enrollment over the last ten (10) years. "Enrollment in the five public school districts has dropped by more than 800 students, from 5,552 in 2008-09 to 4,724 in 2018-19." Comprehensive Plan at 19. Schools have been forced to close due to decreased enrollment. The Comprehensive Plan further

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<sup>3</sup> <https://www.co.greene.pa.us/resources/9196>

acknowledges that the majority of people working in Greene County do not live in Greene County. Currently 62 out of every 100 workers in the County commute from outside the County. *See* Comprehensive Plan at 21. The Comprehensive Plan suggests that inadequate housing choice may be to blame. According to the Comprehensive Plan, the natural average annual housing vacancy rate is 6%, which represents the supply of units in a given market that are not leased or occupied, allowing for housing turnover. However, the average housing vacancy rate in Greene County is much higher at 14.3%. *See* Comprehensive Plan at 23. The Comprehensive Plan explains that the remaining share of vacant housing (8.3%) is not available for sale or for rent, but is vacant due to needed repairs, foreclosure, or other reasons. *See* Comprehensive Plan at 23. Many vacant homes have suffered subsidence-induced damage to the dwelling or water supply and are now owned by coal mine operators. Others may be vacant because the post-mining “unspecified agreement” did not provide full compensation for the necessary repairs.<sup>4</sup> *See e.g.* Act 54 Report at 4-10, 5-12, 11-2; Figure 4-5, Figure 4-6.

\* \* \*

The purpose of Bituminous Mine Subsidence and Land Conservation Act (commonly known as “Act 54”) is “to enhance the value of such lands for taxation, to aid in the preservation of surface water drainage and public and private water supplies, to provide for the restoration or replacement of water supplies affected by underground mining, to provide for the restoration or replacement of or compensation for surface structures damaged by underground mining and generally to improve the use and enjoyment of such lands[.]” 52 P.S. § 1406.2. The Pennsylvania General Assembly acknowledged that the prevention or restoration of damage from mine subsidence is related to the economic future and well-being of Pennsylvania. 52 P.S. § 1406.3.

The Act 54 Report covering 2013-2018 reveals that subsidence-induced damage is commonly resolved through unspecified agreements and that a substantial portion of subsidence impacts to structures and water supplies are resolved through company purchase of the impacted property. The 2020 Greene County Comprehensive Plan reveals that the County has seen a decline in the overall population, an increase in the median age, a dramatic decrease in school enrollment, and an increase in blighted

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<sup>4</sup> Landowners and coal operators almost always disagree about the “reasonable cost” of repair or replacement during post-mining negotiations. *See* 25 Pa. Code § 89.143a. Coal operators often underestimate the cost of repair or replacement.

properties. In light of the Act 54 Report and the 2020 Greene County Comprehensive Plan, we believe the Department can do more to ensure that goals of Act 54 are met.<sup>5</sup>

Accordingly, we ask that the Citizens Advisory Council recommend that the Department issue enforceable orders for repair or replacement of water supplies and structures when the company is found liable for the impact. At the very least, we believe these orders will help to level the playing field during negotiations between property owners and mine operators. Many landowners do not want to leave their homes or accept a less than adequate monetary agreement to perform the repairs themselves. However, when the Department does not get involved until a year or more after subsidence damage has occurred, many landowners are exhausted, frustrated, and desperate to get back to their lives. Alternatively, we ask that the Citizen Advisory Council recommend that the Department require underground coal mine operators submit status updates for impacted properties every six months. The Department should use these routine status updates to proactively identify properties where the Department's intervention would help resolve subsidence damage claims promptly and adequately.

## II. Effects of Mining on Streams

During this assessment period the Environmental Hearing Board ("Board") issued an adjudication in the consolidated appeal of Permit Revision Nos. 180 and 189 of CMAP No. 30841316. *Center for Coalfield Justice and Sierra Club v. DEP*, 2017 EHB 799. These permits allowed Consol Pennsylvania Coal Company to conduct longwall mining in the 1L-5L panels of the Bailey Mine ("Bailey Lower East Expansion"). Since the Board's adjudication was issued in August 2017, the Department's implementation of that decision is not fully reflected in the Act 54 report covering 2013-2018.

### Section 86.37(a)(3) – No Presumptive Evidence of Potential Pollution

To receive a permit, an underground mine operator has the burden to demonstrate, inter alia, that there is "no presumptive evidence of potential pollution of the waters of the Commonwealth." 25 Pa. Code § 86.37(a)(3). Prior to the Board's decision in *Center for Coalfield Justice and Sierra Club v. DEP*, the Department believed that "temporary" subsidence-induced impacts to streams were acceptable so long as the operator submitted a post-mining mitigation plan.<sup>6</sup> The Department read the surface

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<sup>5</sup> We are not suggesting that underground coal mining is solely responsible for these community impacts. However, it certainly plays a substantial role.

<sup>6</sup> See e.g. 2014-072-B Tr. 506:18-21 (Department interprets "maintain the existing and

water protection regulations in an unprecedented narrow manner to only preclude the permanent elimination of a stream. As a practical matter, the difference between “temporary” and “permanent” impact was subjective at best. Streams to the west of the Bailey Lower East Expansion were undermined in 2004-2005 by the 1I – 4I panels of the Bailey Mine. In December 2012, the Department sent a letter stating that the undermined streams had not recovered from the effects of underground mining activities at the Bailey Mine and that the Department was unaware of any additional efforts Consol could be required to take to remediate the affected streams. The Department later said that its December 2012 letter was (still) not a final determination.

Regardless, such an interpretation ignores the plain language of the Department’s water quality and mining regulations and the objective of the Clean Streams Law, which is to protect stream uses from impairment.<sup>7</sup> Unfortunately, the Department issued underground coal mining permits based on the belief that a mitigation plan authorized predicted subsidence-induced flow loss that necessitated disruptive post-mining stream remediation. A promise to perform repairs is not enough. *See e.g. Center for Coalfield Justice and Sierra Club v. DEP*, 2017 EHB 799, 845-846, 865; *UMCO*, 2006 EHB at 570 (“UMCO places great weight on the fact that its mitigation plan is adequate...If it is known in advance that things will go bad, the permit cannot be issued in the first place. The fact that the Department requires deep mining permit applicants to describe how they will repair streams if they are damaged does not mean that it is acceptable to damage streams. Stream mitigation plans are designed to address unanticipated damage, not to excuse or approve damage in advance.”)<sup>8</sup>

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designated uses” as maintain the uses post-restoration; 519:13-520:3 (“it was anticipated that there would be impacts to the streams”); 588:14 – 589:13 (timing of subsidence-induced stream impacts does not matter and mitigation is most important); 1008:3-25; 1435:6 – 1436:12; 1437:19 – 1438:4; 1446:3- 14; 1550:6-20 (“effects can be predicted or expected; however, the necessary stream mitigation plans must be in place to ensure that the stream does return to its existing uses or previous, pre-mining uses”); 1636:2 – 1637:17.

<sup>7</sup> *See* 35 P.S. §§ 691.1, 691.4, 691.401, 691.402, 691.601, 691.611; 52 P.S. § 1406.9a(d); *Center for Coalfield Justice and Sierra Club v. DEP*, 2017 EHB 799; *P.U.S.H. v. DEP*, 789 A.2d 319 (Pa. Cmwlth 2004); *UMCO v. DEP*, 2006 EHB 557-58; *Oley Township v. DEP*, 1996 EHB 1098; *Crum Creek Neighbors v. DEP*, 2009 EHB 566-567.

<sup>8</sup> By way of analogy, the Department will not permit a mine when it is predicted in advance that such activities will cause acid mine discharges. “The mine does not become permissible because an operator promises in advance to treat the discharges[.]” *UMCO*, 2006 EHB at 570; *P.U.S.H. v. DEP*, 1999 EHB at 559 (applying 25 Pa. Code § 86.37(a)(3) to

The Board ruled that the Department must evaluate the “scope and duration” of the anticipated impacts to the streams, which includes any impact resulting from the proposed post-mining stream mitigation measures. *Center for Coalfield Justice and Sierra Club v. DEP*, 2017 EHB at 845-846, 865. “Pollution, as that term is used in 25 Pa. Code § 86.37(a)(3), is properly thought of as a question of impairment.” *Id.* at 844. In order to determine whether the proposed underground longwall mining will comply with Section 86.37(a)(3), the Department must examine whether the anticipated impacts will “result in impermissible impairment of the streams because of the impacts, either as a result of the scope of the impacts, the duration of the impacts or some combination of those two, rise to a level that the streams cannot meet their designated use.” *Id.* at 845-846. If during the permit review, the Department concludes that a coal operator’s mining activity will impair overlying streams, then the Department should deny the requested permit because the operator will have failed to demonstrate that there is “no presumptive evidence of potential pollution” as required by the regulation. *Id.* at 844-845.

#### Article I, Section 27

Article I, Section 27 of the Pennsylvania Constitution, otherwise known as the Environmental Rights Amendment, grants the people of the Commonwealth two distinct rights. *Pa. Envtl. Def. Found. v. Commonwealth*, 161 A.3d 911, 931 (Pa. 2017) (“PEDF”). The first “inherent and infeasible” right guarantees “clean air, pure water, and the preservation of the natural scenic, historic and esthetic values of the environment.” *Id.* The second grants common ownership to “all the people” of “Pennsylvania’s public natural resources.” *Id.* The final clause of the Environmental Rights Amendment creates a trust designating the Commonwealth and all of its subdivisions as the trustee, the natural resources of the Commonwealth composing the trust res, and all the people and future generations as the beneficiaries *Id.*

The Commonwealth’s duties as a trustee require the conservation and maintenance of the corpus of the trust—the public natural resources of the Commonwealth. *Id.* at 932 (quoting *Robinson Twp. v. Commonwealth*, 83 A.3d 901, 956–57 (Pa. 2013)). Importantly, the trust corpus includes the streams overlying underground coal mining operations. *Friends of Lackawanna v. DEP*, 2017 EHB 1123, 1162. “The plain meaning of the terms conserve and maintain implicates a duty to prevent and remedy the degradation, diminution, or depletion of our public natural resources.” *PEDF*, 161 A.3d at 932. The Commonwealth has a further duty to “act toward the corpus of the

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analysis of deep mining discharges).

trust . . . with prudence, loyalty, and impartiality.” *Id.* Put more simply, the Commonwealth must act to conserve and maintain public natural resources in a prudent, loyal, and impartial manner. The Board has explicitly adopted the holding and reasoning in *PDEF*. See *Friends of Lackawanna*, 2017 EHB at 1160–61; *Center for Coalfield Justice and Sierra Club v. DEP*, 2017 EHB 799, 854–56.

Private trust principles, and not the public trust doctrine, govern the fiduciary duties imposed on the Commonwealth as trustee. *Center for Coalfield Justice and Sierra Club v. DEP*, 2017 EHB at 933 n. 26. “Under Pennsylvania trust law, the duty of prudence requires a trustee to exercise such care and skill as a man of ordinary prudence would exercise in dealing with his own property.” *Id.* at 932 (quoting *In re Mendenhall*, 398 A.2d 951, 953 (Pa. 1979)). But “if the trustee has greater skill than that of a man of ordinary prudence, he is under a duty to exercise such skill as he has.” *Mendenhall*, 398 A.2d at 953 n. 1 (quoting Restatement (Second) of Trusts § 174 (1959)).

The trust created by the Environmental Rights Amendment imposes on the Department the duty to act with prudence in its exercise of its expert discretion to maintain and conserve the corpus of the trust for the benefit of all people and future generations. The Department cannot discharge its fiduciary duties by ensuring bare compliance with environmental statutes and regulations. *Center for Coalfield Justice and Sierra Club v. DEP*, 2017 EHB at 860. And it certainly cannot meet its duty of prudence where its decisions are based on speculative and incomplete information.

#### **A. Groundwater and Surface Water Connection**

The maintenance of the groundwater and surface water connection has important implications not only for the stream hydrology, but also for the stream biology. It is critical for stream macroinvertebrates to have moist respiratory surfaces in order to breathe. Without such moisture they will experience a rapid death—within 24 hours. In a natural system they can take refuge in pools or in the hyporheic zone. If mining causes even these portions of a stream to dry up, however, there will be no place for them to survive.

In a natural stream system complete drying is very rare, even during low flow or “no flow” periods. Water can typically still be found in pools and in the sediments or the hyporheic zone. This is because in a natural system groundwater in the underground aquifer holds water throughout the year, gradually discharging water to the stream, and providing base flow. In mined streams, however, the situation is different. Fracturing and the creation of increased pore space causes the aquifer to become depleted more

quickly. Because of a disruption between the groundwater recharge system and the stream, the stream or stream segment can quickly become completely dry. The Act 54 Report notes numerous instances of dead fish observed in dry streams segments undermined by longwall mining during this assessment period. *See* Report at Table 9-11. There were three separate fish kills in Whitethorn Run in October 2016. On October 4, 2016, approximately 700 feet of Whitethorn run dried up and 90 dead fish were observed. *Id.* On October 14, 2016, approximately 2,650 feet of Whitethorn Run dried up and 100 dead fish were observed. *Id.* On October 17, 2016, approximately 3,450 feet of Whitethorn dried up and 200 dead fish were observed. *Id.* Then, on June 12, 2017, flow augmentation for Whitethorn Run was turned off and 300 dead fish were observed. *Id.*

The Act 54 Report reveals that the groundwater data is severely lacking: “The only consistent source of groundwater data for evaluation of subsidence effects are the hydrologic monitoring reports. Monitoring of these sites generally only occurs on a quarterly basis.” Report at 12-6. The Department cannot evaluate the scope and duration of stream impacts without an adequate understanding of how groundwater contributes to surface water flow pre-mining and how subsidence will impact the groundwater aquifers. *See Center for Coalfield Justice and Sierra Club v. DEP*, 2017 EHB at 845-846, 860. Furthermore, the Act 54 Report reveals that “[i]n some of the HMR data, piezometers that are destroyed [during undermining] do not seem to be replaced after destruction. This eliminates the possibility of any pre- vs. post-mining comparisons. This failure therefore eliminates one of the primary reasons for monitoring.” Report at 12-7.

Accordingly, we ask that the Citizens Advisory Council recommend that the Department require underground coal mine operators to sample HMR groundwater monitoring points for groundwater elevation at a frequency that is at least consistent with the pre-mining and post-mining sampling of surface water. The Department must also require the replacement of groundwater monitoring equipment that is damaged or destroyed during undermining.

#### **B. Stream Flow Sampling**

The Department’s pre-mining and post-mining surface flow monitoring requirements are also problematic. The flow monitoring data collected on a weekly or monthly basis will miss the quick recharge events and show a longer dry period than what actually occurred. Conversely it could be taken during a recharge event and miss a significant drying period. In short, the flow data currently collected is inadequate to understand the frequency and duration of low flow or dry periods, and consequently to make informed decisions about the environmental impacts of mining on overlying



streams. See *Center for Coalfield Justice and Sierra Club v. DEP*, 2017 EHB at 845-846, 865. Average or median data really does not tell you much about the behavior of a stream during the drier months of the year. Without any specific analysis of overlying streams to assess frequency or duration of low-flow or no flow periods, the Department does not know when or how long stream segments experience low or no flow pre-mining. As a result, the Department cannot determine how long of a dry period would be problematic post-mining. *Id.* The Department appears to make permitting decisions and stream recovery determinations based on the assumption that if there were some no flow periods in the pre-mining data, any length or frequency of dry periods is acceptable post-mining because it is within the range of flow seen in the background data. See Report at 13-3, 13-5. This is unacceptable.

The Department cannot make an informed decision regarding the environmental effects of its actions if it does not have an adequate understanding of what those effects are or will be. *Friends of Lackawanna v. DEP*, 2017 EHB 1159-60. Likewise the Department cannot be said to have acted with prudence when it acts on speculative or incomplete information. *Center for Coalfield Justice and Sierra Club v. DEP*, 2017 EHB at 860.

Accordingly, we ask the Citizens Advisory Council to recommend that the Department revise its pre-mining and post-mining flow monitoring requirements specified in the Stream Protection Technical Guidance Document. See Report at 12-9, 13-3, 13-5.

### **Conclusion**

CCJ would be willing to meet with members of the Citizens Advisory Council and the Department in order to discuss what more can be done to ensure coalfield communities and public natural resources are properly protected. At a minimum, the Citizens Advisory Council should recommend the following:

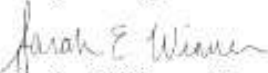
- The Department issue enforceable orders for repair or replacement of water supplies and structures when the company is found liable for the impact. Alternatively, the Department should require underground coal mine operators to submit status updates for impacted properties every six months. The Department should use these routine status updates to proactively identify properties where the Department's intervention would help resolve subsidence damage claims promptly and adequately.
- The Department require underground coal mine operators to sample HMR groundwater monitoring points for groundwater elevation at a

frequency that is at least consistent with the pre-mining and post-mining sampling of surface water. The Department must also require the replacement of groundwater monitoring equipment that is damaged or destroyed during undermining.

- The Department revise its pre-mining and post-mining flow monitoring requirements specified in the Stream Protection Technical Guidance Document. The flow data currently collected is inadequate to make informed decisions about the environmental impacts of mining on overlying streams.

Thank you for your consideration. If you have any questions, please contact me anytime.

Respectfully,



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Tom Schuster  
Clean Energy Program Director  
Sierra Club Pennsylvania Chapter

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Mountain Watershed Association

## Appendix E.

# Selected Comments and Recommendations of the **PADEP** and of the **Citizens Advisory Council** on Previous Act 54 Reports

Compiled by  
Stephen P. Kunz, Senior Ecologist  
Schmid & Company, Inc.  
(Media PA)  
on behalf of  
Citizens Coal Council  
(Washington PA)

January 2021

## INTRODUCTION AND BACKGROUND

ACT 54 was adopted in 1994 to significantly amend the 1966 underground mining law (BMSLCA\*) that had been in place for 28 years. One of the provisions of Act 54 was for the Department to prepare, every 5 years, a report on the effects of underground mining subsidence on surface structures and features, and on water resources. There now have been five such 5-Year Act 54 Reports (the latest prepared for the Department by the University of Pittsburgh and released in late December 2019).

Surface subsidence damage was a significant problem associated with unregulated room-and-pillar coal mines in the mid-twentieth century. The Commonwealth established a Mine Subsidence Insurance program in 1961 to help compensate homeowners for structural damage caused by subsidence from abandoned coal and clay mines. Subsidence problems continued, so in 1966 BMSLCA was enacted to prohibit damage to all homes in place as of that year. As the design of room-and-pillar mines began to improve to prevent subsidence in the 1970s and 1980s, a newer mining method (longwall) was emerging. However, the longwall method conflicted with the 1966 Law's prohibition on structural damage. After numerous unsuccessful attempts to legally invalidate the 1966 BMSLCA requirement for surface support, coal interests sought to change the law to allow longwall mining.

\* Bituminous Mine Subsidence and Land Conservation Act

In 1994, Act 54 amended the 1966 Law, allowing damage to all homes but requiring repair or replacement of damaged structures and water supplies. **Act 54 did not, however, weaken or otherwise change existing legal protections afforded to streams, wetlands, or other water resources.** In accordance with Section 18.1 of Act 54, data have been collected over 25 years and analyzed in five 5-Year Act 54 Reports. The data clearly demonstrate that surface waters and groundwater have been allowed to become collateral damage to the structural damage permitted by Act 54. Not surprisingly, repair of damages to streams, wetlands, and other elements of the complex natural hydrologic balance is not so easy as repair of man-made features, which themselves are not being repaired or restored as envisioned by Act 54.

The 5-Year Reports are provided to the Governor, the General Assembly, and the PADEP Citizens Advisory Council (CAC) in accordance with Act 54. The Reports are intended to inform policymakers, legislators, and the general public about the operation of the Department's underground mining program under Act 54 and to identify areas where changes or improvements may be needed. The following pages include selected excerpts from comments and recommendations made primarily by the CAC following each of the previous 5-Year Act 54 Reports. Most of these are reasonable and constructive, but few have been adopted or addressed by the Department. As a result, many comments have been repeated and opportunities for improvement have been lost.

Excerpts from 30 July 2003 letter from Director, PADEP-BMR  
to Katie McGinty (PADEP Secretary)

In advance of letting contract/scope for preparation of 2<sup>nd</sup> Act 54 Report

The first report, covering the period 1993 to 1998, ..... suffered from a variety of problems that affected its overall quality. Regulations requiring mine operators to report claims of subsidence damage and water supply replacement did not become effective until three months before the end of the reporting period. Data collection was hampered further by the unwillingness of some mine operators to provide details regarding damages and claim resolutions. In addition, the Department's database and geographic information system (GIS) capabilities were not developed to the extent that they could be used effectively in data analysis. Much of the information needed to prepare the report was gathered through surveys of property owners, utilities and local government agencies.

Coalfield citizens groups, environmental groups, the Citizens Advisory Council and certain legislators harshly criticized the 1999 report. In their view, the report simply tallied numbers of damage cases while providing little or no information regarding the severity of damage. Critics also believed that the report failed to adequately assess the effect of mining on groundwater resources, noting that many affected water supplies were replaced by connections to public water systems rather than developing replacement wells and springs. Critics also felt the approach to data collection failed to provide a full accounting of effects on streams and wetlands.

CAC Comments to Harold Miller, PADEP Bur. Of Mining and Reclamation  
(15 Nov. 2005) following 2<sup>nd</sup> Act 54 Report

[T]here are areas where analytical rigor could be improved, as well as areas where the need for further study was identified but not conducted.

[T]here are still several areas where neutrality could be improved; for example, for some issues, the report de-emphasizes concerns based on insufficient or no data. Stating that "no data in this study has been able to support that belief" may technically be accurate, but a lack of data is not equivalent to disproving a hypothesis, which is the conclusion the reader is led to.

In many areas, the analysis is not very rigorous, and in some areas it is more observational than analytical. For example, in assessing the impacts of mining on wetlands, the report acknowledges that the current condition of wetlands was evaluated on the basis of visual observations from public roads or utility rights-of-way.

[T]he report acknowledges "No regional base-level studies of wetlands served as a benchmark for evaluating wetlands....." The lack of adequate baseline information prevents any meaningful analysis of impacts.

CAC Comments to Harold Miller, PADEP Bur. Of Mining and Reclamation  
(15 Nov. 2005) following 2<sup>nd</sup> Act 54 Report

Council is still concerned with the pace of the resolution process. While companies may technically be in compliance, in most cases, three years is simply unreasonably long.

Data needs also continue to be a concern, including but not limited to questions about the reporting of wetlands and water supplies, depth to mine, distance to mining, infrastructure impacts, etc.

The report also acknowledges the need for regional base level studies of wetlands to serve as a baseline. DEP needs to respond with plans to conduct the necessary studies and analyses to respond to these identified shortcomings for the next report.

Findings identify a range of issues, from data collection deficiencies, length of time to resolution, the legitimacy of the distance to mining vs. the no liability determinations, restoration techniques that don't work and may actually make things worse, etc. These are real problems that need more than a cursory mention, and each finding should have a recommended action or plan of action to resolve it.

CAC Comments to Harold Miller, PADEP Bur. Of Mining and Reclamation  
(15 Nov. 2005) following 2<sup>nd</sup> Act 54 Report

We request DEP to report on the status of its implementation of or response to the findings and recommendations and conclusions in this report, including resolution of using a 35-degree angle of hydrologic influence vs. distance to mining as a basis for determining liability, as well as plans for the next report.

The Department needs to address the shortcomings identified by the report (e.g., data needs) and allocate adequate time and resources to the next study, and give serious consideration to conducting it contemporaneously with the study period in order to provide a clear, real-time picture of the situation. While we recognize the seriousness of budget cutbacks and resulting resource limitations, we hope that they will not adversely affect the Department's focus on this issue; it is apparent that the increased attention (e.g., shadow inspectors, new policies for stream protection and water replacement, etc.) given to dealing with the repercussions of full extraction mining has been beneficial.

There is insufficient comparison and analysis of longwall vs. room and pillar [mining].

CAC Comments to PADEP Secretary Krancer (6 June 2012) following 3<sup>rd</sup> Act 54 Report

Future reports should go beyond data gathering and provide a review and at least a preliminary analysis of the issues.

Include long term impact on streams and wetlands and groundwater/surface water interactions.

Unless data is proprietary, data collected under a state contract should be the property of DEP and made publicly available.

The question of cumulative impacts is critical to assessing the effects of deep mining. Specifically:

- What are the cumulative impacts in each category over all reporting periods?
- What trends can be discerned in the extent of damage and impacts in each category?

CAC Comments to PADEP Secretary Krancer (6 June 2012) following 3<sup>rd</sup> Act 54 Report

Regarding water impacts, the focus in the reports should be on an assessment of cumulative hydrological impacts.

Is the Department collecting the right data to be able to predict/minimize impacts? Is the Department using the data to do so?

Do we now understand the geological and hydrogeological systems well enough to predict impacts and act to prevent/minimize them?

Can we document that we are doing a better job at predicting and minimizing impacts, and at resolving in a timely fashion those that do occur?

Are there any conclusions we can reach regarding room-and-pillar versus full extraction mining?

CAC Comments to PADEP Secretary Krancer (6 June 2012) following 3<sup>rd</sup> Act 54 Report

What does the Commonwealth face going forward? Is deep mining moving towards more and more populated and built up areas? How does the growing presence of shale gas drilling in the area affect deep mining?

Is Program staffing adequate to the workload? Is communication with potentially affected landowners adequate and timely?

We note that the 2001 Environmental Justice (EJ) Workgroup report included coal communities as defined EJ communities. As a result, all coal communities should be receiving the extra outreach and attention provided under EJ policies.

While outside the purview of DEP regulation, perhaps DEP can encourage companies to adopt good neighbor practices and cultures to better assist impacted landowners.

CAC Comments to PADEP Secretary Krancer (6 June 2012) following 3<sup>rd</sup> Act 54 Report

We question the acceptability of the use of piped-in public water to augment dewatered streams; we observed one such 'stream' that has reportedly been 'augmented' with three public water lines for a period of four years.

There may be a need for greater oversight of operator responses to impacts to ensure more timely compliance.

Pennsylvania has significant archeological sites that are thousands of years old as well as significant historical resources. It is not possible for Native American cultural resources dating back as early as 7000 BC to be truly 'repaired' if they are harmed by longwall mining. Damage to prehistoric archaeological sites, or cracks in 18th century windows, are irreparable. There may be a need for special precautions and perhaps even prohibition of mining under such resources.



CAC Comments to PADEP Secretary Krancer (6 June 2012) following 3<sup>rd</sup> Act 54 Report

We now have a category of supercritical subsidence where it causes maximum impacts. If narrower panels produce subcritical subsidence, then consideration should be given to the merits of limiting panel width as a means of controlling surface damage. Narrower panels probably leave more coal unrecovered, but it would be useful to know how the value of the coal left compares to the cost of the damages caused.

Pennsylvania needs to objectively examine the benefits of the Act 54 law as well as threats to the health, welfare and safety of the citizens of the Commonwealth and its environmental resources.

Has Act 54 and its regulations kept up with technology or are changes needed to accomplish better balance? Similarly, has Act 54 and its regulations kept pace with development of surface land and aquatic resource restoration techniques?

CAC Comments to PADEP Secretary Krancer (6 June 2012) following 3<sup>rd</sup> Act 54 Report

Pennsylvania's Constitution requires that we protect natural, scenic, historic and aesthetic values of the environment. Should the goal for historic properties be protection (vs. reparation) since the historic value is compromised once it is damaged?

CAC Comments to PADEP Secretary Quigley (24 July 2015) following 4<sup>th</sup> Act 54 Report

The CAC recommends Act 54 be amended to direct underground coal mine owners to disclose to DEP how water supplies and other features impacted by underground coal mining operations were restored, repaired or replaced through private landowner agreements.

The CAC recommends that DEP re-examine its permitting procedures for opportunities to collect additional information and independent analyses to assess pre-mining stream conditions and the probability of subsidence impacts.

The CAC recommends DEP reexamine the bituminous underground mining regulations to assess their adequacy in preventing or mitigating subsidence damage to Pennsylvania's water resources.

CAC Comments to PADEP Secretary Quigley (24 July 2015) following 4<sup>th</sup> Act 54 Report

The CAC recommends review of the following factors relating to impact prediction:

- advancements in technology and modeling that better predict the likelihood of subsidence and measures to prevent such subsidence;
- current modeling to aid in the prediction of stream flow loss, and impacts to wetlands and groundwater;
- trend analysis data collected by DEP to compare actual mine subsidence damage with impact predictions;
- historical data that compares impacts that were predicted vs. impacts that were not predicted;

The CAC recommends review of data assessing the impacts of mining subsidence to water quality, including the degradation of Special Protection streams.

CAC Comments to PADEP Secretary Quigley (24 July 2015) following 4<sup>th</sup> Act 54 Report

The CAC recommends DEP analyze what elements of *TGD #563-2000-655: Surface Water Protection – Underground Bituminous Coal Mining Operations* need to be incorporated into regulations so that those standards and provisions required of the underground coal mining industry can be enforced uniformly by DEP.

The 35<sup>0</sup> Rebuttable Presumption Zone should be reassessed by DEP through consultation with appropriate technical professionals.

The CAC recommends that DEP revise its permitting processes to ensure sufficient and detailed information on wetlands, including verifying the presence of wetlands through consultation and coordination with the U.S. Army Corps of Engineers and incorporating appropriate measures into the permit to avoid impacts to wetlands.