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Thomas Callaghan, Director
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Pennsylvania Department of Environmental Protection
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Harrisburg, PA 17105-8461

In re: **Scope of Work for 5th Act 54 Five-Year Assessment**
University of Pittsburgh Master Agreement (Contract No. 44000011482)

Dear Mr. Callaghan:

On behalf of the Citizens Coal Council[1], this letter provides comments on the above-referenced Scope of Work/Agreement between the Department of Environmental Protection ("Department") and the University of Pittsburgh ("University") regarding the preparation of the 5th Act 54 Assessment. The intent of these comments is to point out what we perceive as shortcomings or deficiencies in the proposed work that, if corrected in a timely manner, will help ensure that this 5th Assessment addresses crucial issues and more fully meets the objectives of Act 54 than the four prior Assessments.

For 28 years prior to enactment of Act 54 in 1994, the Pennsylvania underground mining law (known as the Bituminous Mine Subsidence and Land Conservation Act [BMSLCA] of 1966; P.L. 31, No. 1) had *prohibited* damage to certain homes, structures, and cemeteries. Under Act 54, damage from underground mining is *allowed*, but with the provision that certain damages are to be repaired, restored, or compensated. Because of this significant change in dealing with mine-related impacts, including damage that is predicted and intentional, Section 18.1 of Act 54 directs the Department to compile and analyze information regarding the effects of deep mining on surface structures and features and on water resources, and to prepare a report assessing those effects every five years.

This 5th Assessment will address the impacts associated with underground coal mining subsidence for the period from August 2013 to August 2018. The University assisted the Department in preparing both the 3rd and the 4th Act 54 Assessments, covering the 10 years from August 2003 to August 2013. Those Assessments reveal that adverse impacts on structures and water resources have been disproportionately associated with longwall mines rather than with the more numerous, traditional room-and-pillar operations.

[1] CCC, a grassroots nonprofit organization based in Canonsburg PA, seeks to inform, empower, and work for and with communities affected by the mining, processing, and use of coal. More at http://citizenscoalcouncil.weebly.com/

In mid-December 2017, the Scope of Work for the 5th Act 54 Assessment was made public on the Department's Bureau of District Mining Operations website. In the comments below we identify numerous matters that should be considered, addressed, and (ideally) incorporated into a revised Scope of Work. We first discuss each specific issue, and then (**in blue**) raise a specific question that the Department should answer, or should ask University staff to answer, before preparations for the 5th Assessment get too far along. We believe that careful responses to these 34 questions are critical if the potential benefits of this Assessment are to be realized.

Cost of the 5th Assessment

The cost for this 5th Assessment ($794,305) is significantly higher than the two previous ones that also were done by the University of Pittsburgh. The 3rd Act 54 Assessment was completed for $313,000, and the 4th was done for $603,000.

Inasmuch as the University has gone through the Act 54 Assessment process two times already, some economies might be expected this time around as a consequence of prior experience and institutional memory. Some efficiency of work and even cost savings might be anticipated as a result of the University's familiarity with the Department's underground mining data collection systems, policies, and procedures as they relate to the objectives and requirements of Act 54. Instead, a significant increase in cost has been approved.

Q1: What specific factors account for the significant increase in cost?

This 5th Assessment is stated to cost $794,305 (according to page 1 of 2 of Attachment 2), which represents a 32% increase over the cost of the 4th Assessment. On the next page (page 2 of 2 of Attachment 2), however, the cost is listed as $792,558.

Q2: Has this discrepancy of $1,747 been resolved? What is the *actual* total budget that is being allocated for this 5th Assessment?

BUMIS and GIS

In the earlier Act 54 5-year Assessments, the Department's BUMIS (Bituminous Underground Mining Information System) was identified as being the primary source of mine impact data relied upon for analyses. However, during the preparation of the 4th Act 54 Assessment, there appear to have been some misunderstandings on the part of the University concerning what BUMIS is and what it tracks. (This is despite the fact that the University previously had used BUMIS data in preparing the 3rd Act 54 Assessment.) The following comments, excerpted from the 4th Act 54 Assessment, highlight some of the confusion:

> "BUMIS cannot be relied upon as the authoritative source of information on undermined surface features, impacts or impact resolution." (page II-6)

"During the course of data collection, the University discovered that BUMIS is incomplete." (page VII-26)

"... 25% of the stream impacts from [the 3rd Assessment] period are not identified in the BUMIS database." (page VIII-2)

"Because BUMIS was not designed to track the complexity of stream impacts, PADEP has struggled to develop a system for recording stream data." (page EX-3)

Q3: Is it now clear to the University staff exactly what is and is not contained in BUMIS, especially regarding streams?

Q4: Has BUMIS been revised, or an alternative developed, so that stream impacts during this 5th Assessment period are being adequately tracked and can be properly identified and assessed?

According to the first page of "Exhibit A - Scope of Work", in addition to BUMIS data for the August 2013 to August 2018 period, the Department will provide to the University "*GIS data and any other information that may be available to use for the assessment*." Presumably this includes mine-related GIS data that are publicly available through PASDA[2] (such as outlines of mines and individual longwall panels, streams, etc.).

Q5: Will the Department be providing GIS data relating to underground mining other than what is contained in BUMIS or publicly available from PASDA? If so, what is it and how will it be used?

During preparation of the 3rd Act 54 Assessment the University determined BUMIS to be inadequate as an Act 54 assessment tool by itself. Thus, the University researchers created their own GIS program and database which they called the "*University GIS Database" (UGISdb)*. In preparing the 4th Act 54 Assessment, the University created another new GIS database at considerable cost to the Commonwealth, which it called the "*Act 54 Geographic Information System*" (Act54GIS). Whether the second database bore any relationship to the first database was not stated. Nor was mention made as to whether either database was made available to the Department or the public. As noted in the 4th Act 54 Assessment:

"Data collection, error checking, and incorporation in the .... Act54GIS collectively represented by far the largest proportion of total University effort on this project. Once completed, this system contained spatially explicit information on all features for which the effects of underground coal mining are regulated by PADEP. .... The Act54GIS makes possible analysis and reporting of all information required by the [Act 54 contract], including comparisons with past assessment periods. Further, it provides a useful basis for organizing the information necessary for future reports." (pages XI-2 to XI-3)

The University of Pittsburgh thus already has created two separate Act 54-related GIS databases using Commonwealth funds. This further draws into question the rationale behind the significant *increase* in the budget for this 5th Assessment.

[2] The Pennsylvania Spatial Data Access (PASDA) is Pennsylvania's official public access geospatial information clearinghouse. PASDA was developed in 1996 by the Pennsylvania State University and has served as the electronic clearinghouse for Pennsylvania ever since. http://www.pasda.psu.edu/

Q6: Will either or both of the GIS databases previously developed by the University for the 3rd and 4th Act 54 Assessments be used for this 5th Assessment, or will another one need to be created anew? If the latter, why?

Q7: If another new GIS database is created, or one of the previous ones is updated for this 5th Assessment, will it be made available to the Department or the public?

Mine Subsidence Insurance Records

Another source of information upon which the analyses of this 5th Assessment are to be based is "*mine subsidence insurance records*" (per "Objective" on page 1 of Attachment 1). Such records also were supposed to have been used in the 4th Act 54 Assessment, but in fact they were not. Information in those records should be very informative. This 5th Assessment could and should examine the frequency and severity of recent subsidence impacts to structures from abandoned room-and-pillar mines as documented in the Mine Subsidence Insurance Program files, and compare that with the frequency and severity of subsidence impacts to structures from longwall mines during the current 5-year period. It would also be of interest to identify trends in these measures of damage over time, at minimum between the 3rd, 4th, and 5th Assessment periods.

Q8: Are mine subsidence insurance records actually planned to be utilized in this Assessment, and if so, how?

Assessment of: Mining Operations (Item "A" on page 1 of Scope of Work)

Identifying the acres of land and the number of existing structures, water supplies, properties, streams, etc. above each **mine** that was active for some time during the 5-year period was done in the 3rd Act 54 Assessment, but not in the 4th Assessment. It is commendable that something similar is proposed to be done in this 5th Assessment, because it can provide useful information for evaluation and comparison. As worded, however, it sounds as though the breakdown will be by mining *method*, rather than by mine *type*. Depending on what is meant by "mining method", that could be a mistake.

The distinction between mine *types* and mining *methods* is important and must be clear for this Assessment to provide useful information. There are three mining methods used to extract coal underground in Pennsylvania: room-and-pillar, longwall, and retreat. Retreat mining methods were more commonly used decades ago before longwall mining became the more popular and profitable high-extraction method. At present, retreat mining methods account for a very small percentage of coal produced. Mines classified as "retreat mines" in the 2nd through 4th Act 54 Assessments actually used retreat methods in only 20% or less of their mined area, relying mainly on traditional room-and-pillar methods (in 80% or more of their acreage). Retreat methods were used beneath only 283 acres (out of a total 31,343 acres mined, or less than 1%) during the 4th Act 54 Assessment period, and the proportion of area mined by retreat methods during the 5th Assessment period is likely to be even smaller.

So, ignoring retreat methods, there essentially are only two mining methods to be evaluated: longwall and room-and-pillar. Room-and-pillar (R&P) mines use room-and-pillar methods exclusively. All longwall mines use a combination of longwall and room-and-pillar methods. Room-and-pillar methods are used for "development mining" in a narrow area around the perimeter of enormous longwall panels, and on average account for about one-quarter of the total area of a longwall mine. The R&P development mining areas are used to transport workers, equipment, and coal between the underground mine and the surface. Thus, their stability is a high priority, and they are designed to not subside.

The R&P development area between longwall panels generally is only about 250 feet wide, whereas the panels themselves are 1,500+ feet wide. If a surface feature is located above the middle of the R&P development area between adjacent longwall panels, it will be no more than 125 feet from the edge of each adjoining panel. If that feature is damaged, it will be a result of longwall mining on either side of it (because there is a significant "angle of influence" which extends outward beyond the edge of every longwall panel) rather than of the R&P mining method utilized directly beneath it. If that impact is counted as being associated with R&P, it will erroneously overcount R&P impacts and undercount longwall impacts. This conceptual mistake was made during the 4th Act 54 Assessment and is illustrated in Table VII-7 in that report. In that Table and the text that makes reference to it, stream flow impacts associated with five longwall mines are inappropriately disaggregated by longwall or room-and-pillar methods, and impacts for 6.55 miles of streams were attributed to "room-and-pillar techniques" when in fact all of those impacts were due to longwall mining.

Thus, determining the number of acres (or structures, water supplies, wetlands, etc.) associated with each individual ***mine*** (longwall or room-and-pillar) is the important metric, and it will also serve to accurately distinguish impacts by mining method.

Q9: Does the University staff understand the distinction discussed above? Does the University staff understand the importance of disaggregating elements of mining (acres, impacts, etc.) by both individual mine and mine type (longwall mine, room-and-pillar mine, etc.) rather than by mining method acreage per se within a given mine?

Assessment of: Structure Impacts (Item "B" on page 1 of Scope of Work)

It is commendable that the 5th Assessment proposes to determine and report on the number of structures undermined, and to illustrate the locations of undermined structures. As discussed more fully above, however, the information should focus on individual mines (or mine types) rather than on mining methods per se. If the intent per Act 54 is to identify structure impacts and determine their cause, it would be inappropriate to organize those impacts by *where* the structure happens to be located (above a longwall panel or above a R&P area between longwall panels) rather than by what mining method *caused* the impact. It is disingenuous and even misleading to suggest that subsidence effects experienced by a structure located directly above the narrow area *between* longwall panels are not due to longwall mining.

Q10: Does the proposal to "organize by mining method" the structures undermined and impacted refer to the *location* of a structure vis-à-vis the underlying mining method, or to the type of mining that caused the impact? If the former, an explanation as to how that is thought to be reasonable must be provided.

Assessment of: Water Supply Impacts (Item "C" on page 2 of Scope of Work)

It is commendable that the 5th Assessment proposes to determine and report on the number of water supplies undermined, and to illustrate the locations of undermined water supplies. As discussed more fully above, however, the information should focus on individual mines (or mine types) rather than on mining methods per se. If the intent per Act 54 is to identify water supply impacts and determine their causes, it would be inappropriate to organize those impacts by *where* the water supply happens to be located (above a longwall panel or above a R&P area between longwall panels) rather than by what mining method *caused* the impact. It is disingenuous and even misleading to suggest that subsidence effects experienced by a water supply located directly above the narrow area *between* longwall panels are not due to longwall mining.

Q11: Does the proposal to "organize by mining method" the water supplies undermined and impacted refer to the *location* of a water supply vis-à-vis the underlying mining method, or to the type of mining that caused the impact? If the former, an explanation as to how that is thought to be reasonable must be provided.

It is commendable that the number of water supplies reporting diminution or degradation is proposed to be compiled in this 5th Assessment, and the outcomes of all water supply impact claims are to be analyzed. It is not clear from the proposed Scope of Work, however, whether the impacted water supplies are to be disaggregated by existing use (residential, agricultural, commercial/industrial, recreational, community/institutional), which would be of interest. It also is unclear from the Scope whether the water supply impacts are to be reported and evaluated according to mining type that caused the impact (longwall vs. room-and-pillar), which is a relevant factor.

Q12: Will impacted water supplies be disaggregated by use, and if not, why not?

Q13: Will water supply impacts be reported/evaluated according to mining type that caused the impact, and if not, why not?

Assessment of: Groundwater (Item "D" on page 2 of Scope of Work)

The first task listed in this section is to "compile the number of groundwater wells vs the number of public water supplies used for stream augmentation". While this may be peripherally related to groundwater, it seems to be more directly related to stream impact mitigation. (As a side note: most of the 45-page long section on Groundwater in the 4th Assessment did not actually discuss groundwater, but focused instead on flow loss, monitoring, and augmentation of streams.)

Q14: Would this task not be more appropriate in the section "Streams"?

If this first task is to be useful to groundwater considerations, then in addition to the "number" of wells in each category (private vs. public), researchers should compile and evaluate the *quantity of water withdrawn* by each source for stream augmentation. Significant water withdrawals for stream augmentation could adversely affect the yield of nearby wells.

Q15: Would it not be useful to also compile and evaluate the volume of water withdrawn by each source for stream augmentation?

The second task in this section (evaluating the methods being used and the data being compiled and reported to address groundwater impacts) seems reasonable. However, the questions to be addressed in this section (Are the methods/sampling frequency adequate? Are the data realistic, complete, useable?) are questions that the University had raised --- and in some cases already answered --- in the 4th Assessment:

> "...observations of groundwater are limited to relatively few and spatially limited points (i.e., wells)." (page VI-27)
>
> "Analysis of affected water supplies relative to lowered water tables is challenging given the existing data is limited in spatial and temporal density." (page VI-28)
>
> "Few piezometer, spring, or well HMR points were in close proximity to most of the reported effects." (pages VI-28 to VI-29)
>
> "In general, we found a quarterly sampling frequency [of groundwater elevations] inadequate to characterize impacts to system hydrology....even daily sampling frequency cannot necessarily capture rapid changes occurring during subsidence." (page X-5)
>
> "...given the hydrologic complexity of the region and the resulting complexity in hydrologic response, the data, as reported, is insufficient to allow clear assessment of hydrologic impacts." (page VI-44)

Q16: In those instances where University researchers already have determined that sampling of hydrologic data and reporting them to the Department for groundwater assessment are inadequate, what steps has the Department taken to rectify the situation during this 5th Assessment period? Would any findings be expected to differ from those of the 4th Assessment listed above?

Assessment of: Streams (Item "E" on pages 2-3 of Scope of Work)

A significant focus of the 4th Act 54 Assessment was on stream impacts, which was important and useful because stream impacts had received little attention in the previous Act 54 Assessments. Also, many practical suggestions and recommendations made by the University in the 4th Assessment were directed at how the Department could better manage the collection of stream flow data and stream impact data. Hopefully the Department has heeded the advice of the University and made the changes necessary to make stream impact evaluation more meaningful in this 5th Act 54 Assessment.

One task in this category is to evaluate the "*reported*" hydrologic monitoring data related to stream flow. Presumably this refers to HMRs (Hydrologic Monitoring Records) and other premining flow data that typically are included in permit applications. As CCC and

others have pointed out numerous times, however, significant stream flow data are required to be *recorded* by mine operators in accordance with TGD 563-2000-655 and Module 8 of the permit application, including weekly and daily flow monitoring data just prior to a stream being undermined, during undermining, and following undermining until premining flow has been restored. Those data (which presumably are being *recorded*, if not always or consistently *reported* to the Department) represent an enormous and potentially crucial body of information directly related to identifying and regulating mining effects on streamflow and thus should be incorporated into this 5th Act 54 Assessment.

Q17: Exactly what are the "reported hydrologic monitoring data" which are mentioned in the Scope of Work?

Q18: Will the streamflow data --- that have been required for more than 10 years to be recorded by operators for every stream above every longwall panel per TGD 563-2000-655 and Module 8 the permit application --- be utilized in the analyses for this 5th Assessment?

It is commendable that the 5th Assessment proposes to determine and report on the total lengths of streams undermined, and to illustrate the locations of undermined streams. As discussed more fully above, however, the information should focus on individual mines (or mine types) rather than on mining methods per se. If the intent per Act 54 is to identify stream impacts and determine their cause, it would be inappropriate to organize those impacts by *where* the stream happens to be located (above a longwall panel or above a R&P area between longwall panels) rather than by what mining method *caused* the impact. It is disingenuous and even misleading to suggest that subsidence effects experienced by a stream located directly above the narrow area *between* longwall panels are not due to the adjacent longwall mining.

Q19: Does the proposal to "organize by mining method" the lengths of streams undermined and impacted refer to the *location* of a stream vis-à-vis the underlying mining method, or to the type of mining that caused the impact? If the former, an explanation as to how that is thought to be reasonable must be provided.

Another task listed under this category is to report the lengths of stream reaches according to whether they a) experienced no effects, b) were affected by pooling, or c) were affected by flow loss. During the 4th Act 54 Assessment, the determination of whether a stream was affected by flow loss or pooling typically was made indirectly, by identifying the lengths of streams that had received augmentation or gate cuts. It would be more accurate and preferable to report directly the lengths of stream reaches affected by either flow loss or pooling (such as can be determined from the streamflow data that are required to be collected by operators before, during, and after undermining streams in accordance with TGD 563-2000-655 and Module 8 of the permit application). However, if indirect measures must be used, they at least should be applied uniformly and consistently. In the 4th Act 54 Assessment the University recommended that the Department "...*establish a more rigorous protocol for assessing impacts on stream flow*... [first, by establishing] *a standard measure of stream flow* ...[such as] *volumetric flow rates*." We hope that the Department has done this.

Q20: On what basis will the lengths of stream reaches affected by flow loss and pooling be identified?

Q21: Will the streamflow data that are required to be recorded by operators for every stream above every longwall panel (per TGD 563-2000-655 and Module 8 of the permit application) be utilized in the analyses for this 5th Assessment?

One commendable task listed under "Streams" is to compile and evaluate the number of claims of stream flow loss and pooling, as well as the results of those claims. Not clear in the Scope, however, is how, when, or by whom those claims can be determined. One significant issue discussed in the 4th Assessment was the fact that how and when the Department identifies a formal stream damage investigation changed between the 3rd and 4th Assessment periods, so no direct comparisons could be made.

Q22: How, when, and by whom is a claim for stream flow loss or pooling currently being made? Is that consistent with prior periods so that trends and comparisons can be addressed adequately?

Another task listed under "Streams" is to compare the pre- and post-mining biological scores of five streams. Presumably, those five streams are ones that were impacted by mining, because no post-mining total biological score (TBS) would be available otherwise. The pre-mining TBS is clear enough, but which post-mining TBS is to be used is not stated. Is it one collected after restoration has been deemed successful? Is it one collected at some interim point after restoration activities have been initiated? Whatever criterion is selected, it should be applied consistently for all 5 streams examined. Also, the University should not take it upon itself to conduct its own post-mining TBS except perhaps as a check on a post-mining TBS already reported.

Q23: Have the Department and the University established the timing and rationale for selecting which post-mining TBSs will used to compare with the pre-mining TBSs for this evaluation?

One task listed under "Streams" is to identify all mitigation projects that "occurred". We presume "occurred" means mitigation projects that were ongoing at some point during the 5-year assessment period. A "mitigation project" typically will focus on a length of stream impacted by subsidence, but parts of a stream restoration project may be successful while parts are less so, or even unsuccessful. University researchers should be sure to subdivide stream mitigation projects into the smallest segments possible for analysis at the end of the 5-year period. Also, stream mitigation projects can take years, and often will overlap with preceding or subsequent Assessment periods.

Q24: How exactly will stream mitigation projects be identified?

For many decades longwall mine operators had largely avoided undermining "Special Protection" streams that are designated in the Department's Chapter 93 Water Quality Standards as either Exceptional Value (EV) or High Quality (HQ). Now that coal reserves beneath non-Special Protection streams are becoming scarce, longwall operators are

moving into the watersheds of Special Protection waters. During the last few years, longwall mines have undermined more than 6,000 acres of High Quality-designated streams (about 20% of the area undermined so far in 5th Assessment period). However, there is no mention in the Scope about evaluating separately the impacts of mining on Special Protection waters. It would be important to determine the extent to which impacts to Special Protection waters have occurred, and how that compares with impacts to non-Special Protection waters.

Q25: Will the 5th Assessment provide any analysis of subsidence impacts on Special Protection waters?

Of great interest in this 5th Assessment would be the final status of the 6 streams that had not recovered during the 4th Assessment period despite many years of attempted restoration (see Table VIII-3). Some, if not all, of those stream impacts were classified as "resolved" inasmuch as the attempted restoration was determined by the Department to have been unsuccessful, and so alternative mitigation would be required.

Q26: Will there be any follow-up evaluation of those 6 stream impacts to determine the outcome or status of any alternative mitigation?

Q27: How many other stream impacts subsequently have been assigned to the category "unsuccessfully restored = resolved = alternative mitigation required"?

Assessment of: Wetlands (Item "F" on page 3 of Scope of Work)

Wetlands can be impacted by underground mining in the exact same way that streams can suffer water loss or pooling. However, to date there has been no systematic review or evaluation of wetland losses from underground mining other than to identify (and mitigate for) wetlands that may be affected directly by stream restoration activities. TGD 563-2000-655 requires wetlands above each full-extraction mine to be delineated prior to mining and then reassessed 12 months after undermining, but that apparently is not being done, nor does it make any sense to do it. The physical appearance (soils and vegetation) of most Pennsylvania wetlands will not change appreciably in one year even if hydrology has recently been diminished or eliminated. Many regulated wetlands only are "wet" for several weeks continuously during the growing season, and even a natural drought for a year is unlikely to change the size of a carefully delineated wetland. One would not be able to determine whether a specific wetland's hydrology has been altered 12 months after being undermined without first collecting many years of baseline hydrology measurements, something that no mine operator is doing and none is required to do. For these reasons, the TGD requirements for wetland impact evaluation are in need of serious reconsideration.

One task in this category is to identify the acreage of wetlands undermined. While that sounds simple enough, in my experience, there has never been an accurate and comprehensive delineation of wetlands above an underground coal mine in Pennsylvania. Except perhaps where surface facilities are proposed, wetlands are not consistently being delineated above the entire underground mine area and then getting

reviewed and confirmed as accurate by the Corps of Engineers. In many cases, operators may have wetlands professionally delineated using the accepted federal methodology, but rarely, if ever, do they get a Corps JD (jurisdictional determination). Without a Corps JD, there is no independent or impartial check on the accuracy of the wetland delineation. Especially if operators know that there will be minimal or no agency review of the accuracy of their premining delineations, there can be a tendency to spend less time/resources and to be less diligent in finding all wetlands. A less than diligent effort to locate all existing wetlands prior to undermining can allow an operator to "find" those wetlands postmining and claim that they were created by the mining and thus use them to offset any actual wetland losses.

Q28: Is there any reason to believe that any wetlands delineated above underground mines that were active for some time between 2013 and 2018 will have been reviewed and confirmed as accurate by the Corps of Engineers? If not, how can it be verified during this 5th Assessment that wetlands identified by mine operators were accurately delineated and none was missed?

Another task in this category is to identify the acreages of impacted wetlands. Again, this sounds simple, but as discussed above, it is exceedingly difficult to determine whether a wetland has lost its hydrology after only a year or two, because many Pennsylvania wetlands are not "wet" all year, or even most of the year. If a wetland becomes flooded following subsidence, that change can be easier to determine than dewatering. Further complicating matters is the fact that there currently is no assurance that all premining wetlands were accurately identified in terms of size, location, classification (PEM, PFO, etc.), or functions and values.

Q29: On what basis will wetlands be determined to have been impacted (or not) during this 5th Assessment?

Impact Resolutions

One positive proposed aspect of the 5th Assessment Scope of Work is that the outcome/results of all claims made for the various impacts are proposed to be evaluated in terms of time to resolution and type of resolution. Although not clearly stated, these various outcomes also should be disaggregated by mining type. And the types of "resolution" should include: repair/replacement, payment for loss, and purchase of damaged property. If a non-disclosure agreement was used to resolve an impact, that should be noted. Even in instances where a non-disclosure agreement is involved, however, the actual resolutions should be able to be determined and reported (individuals' identities can remain undisclosed).

Q30: Will the outcome/results of all claims made for the various impacts be disaggregated by mining type? If not, why not?

Other Omitted Resources

Section 18.1 of Act 54 mandates these 5-year assessments, and directs the Department to analyze the effects of underground mining on "surface structures and features and water resources", and to rely on "***information...from any...appropriate source***".

Accordingly, any relevant source of information that will help inform this analysis regarding the nature and severity of impacts from underground mine subsidence ought to be utilized. However, several appear to have been omitted.

As already mentioned above, there is no indication in this Scope that the huge volumes of data that longwall operators are required to collect (per TGD 563-2000-655 and Module 8 of the permit application) on the flow of every stream just prior to, during, and following their undermining are planned to be reviewed or evaluated in this Assessment.

Also, there is no mention in this Scope about making use of the CHIAs (Cumulative Hydrologic Impact Assessments) which are supposed to be prepared by the Department in its review of every new or revised underground mine operation. Each CHIA (PADEP Form 5600-FM-BMP0017, last revised 9/2013) that was prepared for the mines active during the 5th Act 54 Assessment period would appear to be an invaluable source of information for evaluating and analyzing expected hydrologic impacts in accordance with Act 54. The University should be directed to evaluate the findings provided in the Department's CHIAs, compare them with actual experience, and offer appropriate recommendations.

Q31: Is the CHIA for each mine active during this 5-year period going to be provided to the University and used in the analyses for this Assessment?

Assessment Item "G" on page 3 of Scope of Work ("Final Report")

The sections listed here for the Final Report all make specific reference to "documentation of impacts in/during the 5-year period". Likewise, most of the individual assessment items discussed in the Scope make reference to "the pre-determined period", which presumably means the five years between August 2013 and August 2018. When Sharon Hill and Greg Shuler were discussing this 5th Assessment with the Citizens Advisory Council at their meeting on 14 November 2017, mention was made to the effect that the evaluations "*would be limited to what is specifically required by Act 54*". All of these indications seem to suggest that the Assessment may be focused exclusively on what occurred during this 5-year period, with no examination of trends over time. That would be a major lost opportunity.

Section 18.1 of Act 54 says that these assessments are to be prepared at five-year intervals, but it does not limit the focus of the evaluations to the specific five-year period under review. Past Act 54 Assessments have, for example, followed up on impacts that occurred in a previous 5-year period but were unresolved at the end of that period. Such follow-up is not only reasonable, but it is necessary for a complete understanding of the

scope of impacts associated with different methods of mining, because many of those impacts take longer than 5 years to be resolved, and some may never be resolved.

There is nothing in the language of Act 54 which prohibits the Department from examining trends over time. A single 5-year period cannot be examined in isolation if thoughtful evaluations are to be made and useful conclusions are to be drawn and lead to actionable improvements. Indeed, as additional data are developed on the same issues with each successive Act 54 Assessment, it makes sense to examine and evaluate trends in impacts and impact resolutions. Are conditions getting better, or worse (as CCC members believe, based on their first-hand experience), or staying about the same? Unless data are examined cumulatively, and each Assessment Period is compared and contrasted with prior ones, the Department will never be able to answer those kinds of questions. Identifying trends over time is a logical focus of an analysis of this type, and should be particularly suited to University researchers using data compiled in their GIS databases, BUMIS, and other files provided by the Department. However, the Scope of Work appears structured to limit any such analyses.

Q32: Will trends regarding impacts and resolutions over time (*i.e.*, from one 5-year period to the next, or across all of the 5-year Act 54 periods to date) be identified, evaluated, and discussed in the 5th Assessment?

Another area of analysis that should be a primary task in this 5th Act 54 Assessment is how accurately impacts are being anticipated or predicted in advance. One of the basic assumptions that was promoted when Act 54 was still under consideration was that "planned" subsidence from longwall mining was better than unplanned subsidence from abandoned room-and-pillar or retreat mines (because the damage from planned subsidence is more predictable and immediate, and thus can be repaired in a timely manner). Module 8 in the underground mine application, since at least 2008, has required applicants, among other things, to:

- Provide a prediction of the location, magnitude and duration of mining induced flow loss (by individual stream)
- Provide the results of a Wolman Pebble Count for each site where mining induced pooling is predicted to occur.
- Provide an assessment of the potential effects of pooling...
- If predictions show that one or more wetlands are likely to experience adverse effects, provide an alternatives analysis showing why it is unfeasible to amend the mining plan to avoid the adverse effects...
- Identify private water supplies that are likely to be contaminated, diminished, or interrupted by underground mining operations.

When the Scope of Work for the 4th Act 54 Assessment was circulated in 2012, I suggested that an evaluation of impact predictions would be a useful focus of analysis in that Assessment. It was not done. This same point has been raised again and again since the release of the 4th Assessment, and if anything, it becomes even more important as time goes on.

Qualified University researchers should evaluate how often subsidence damage is predicted, how accurate those predictions are, and how incidents of "predicted" damage

compare with unplanned damage incidents in terms of severity, type of actual final resolution, and time to final resolution. As we approach the 25-year anniversary of Act 54, these are critically relevant matters to finally begin to address. Since BUMIS and other GIS databases have been compiling data on subsidence impacts for close to a quarter century, it should be relatively easy to quantify the number of predicted (versus unpredicted) impacts and to evaluate the location, extent, and severity of actual impacts vs. predicted impacts by type (flow loss, pooling, wetlands, etc.).

Q33: Will there be any attempt in this 5th Act 54 Assessment to evaluate either the accuracy of impact predictions or the assertion that longwall-related impacts are less severe, are more quickly repaired, or in any other way are less damaging and preferable to room-and-pillar impacts?

Whose Assessment Is This?

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 typically utilizes the services of outside researchers (in this case the University of Pittsburgh) to prepare the Assessment on its behalf, at the end of the day it is the Department's report and it must represent the Department's views.

Nearly a full year after it had released its 4th Assessment, the Department (in November 2015) circulated an internal review that took issue with, and even disputed in part, some of the findings and recommendations of its 4th Assessment. Even now, some of the questions that the Scope of Work for the 5th Assessment proposes to raise are issues that were already raised, and in some instances resolved, in the 4th Assessment, as if Department staff still has not read that document. If the Department does not believe, accept, or understand the conclusions in its Assessments, its responsibility is to resolve those matters before the final products are released.

Q34: Does the Department recognize that the legislative mandate to prepare these Assessments is directed to it, and thus the findings and recommendations of the Act 54 Assessment should be those of the Department? Will the Department commit to resolve with the University all discrepancies and misunderstandings regarding the 5th Assessment *before* the final version is released?

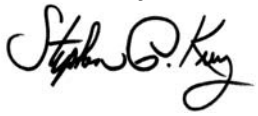
On behalf of the Citizens Coal Council, I trust that these comments will be useful to the Department and to the University as they finalize plans to undertake this crucially important analysis. CCC and its Pennsylvania coalfield members have been sadly disappointed in each of the previous Act 54 Assessments for various reasons. Their greatest frustration, however, is that the damages being inflicted on them, their families, and the resources of their communities keep increasing rather than decreasing, as if no one in a position to do anything really cares or is paying attention. Damages to their homes, water supplies, streams, and other features --- even those which are *predicted* ---

are taking much too long to resolve, and in too many cases the final "resolution" does nothing to actually fix the damage.

The issues are not new, the problems are not new. Each of the previous Act 54 reports has suffered from critical data gaps that should have been anticipated and could have been avoided. The underground mine regulatory process still --- almost 24 years after Act 54 was enacted --- is failing to accurately identify all the resources at risk, to monitor and assess all the adverse impacts, and to adequately provide the protections that are supposed to be provided by Act 54, by the Clean Streams Law, and under Article I, Section 27 of the Pennsylvania Constitution. If the issues raised above are taken seriously, we may dare to be hopeful that this 5th Assessment will more fully meet the intent and objectives of Act 54.

If you have any questions, please feel free to let me know.

Yours truly,



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Donald S. Welsh (Chair, PADEP Citizens Advisory Council)
Joel Koricich (PADEP, California District Mining Manager)
Aimee Erickson (Citizens Coal Council)

Relevant/Related Links:

Scope of Work for 5th Act 54 Assessment (2017)
Comments on Scope of Work for 4th Act 54 Assessment (Sept. 2012)
Review and Analysis of PADEP's 4th Act 54 Assessment (March 2015)
Review and Analysis of PADEP's 3rd Act 54 Assessment (April 2011)
Stream Protection in PA in the Context of Underground Coal Mining (Oct. 2017)
Longwall Mining A to Z (May 2016)
Permitting Longwall Coal Mines in PA (July 2014)