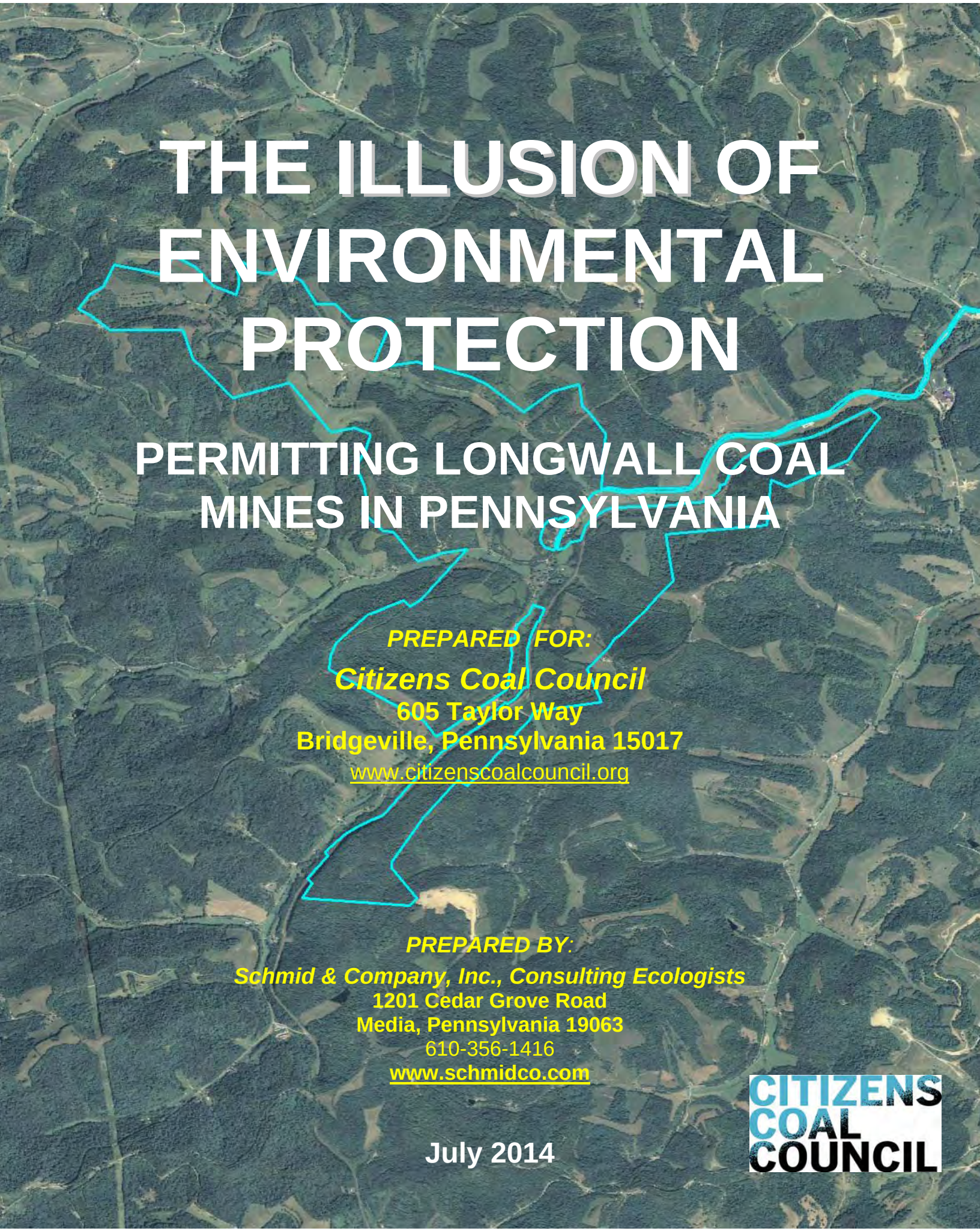

THE ILLUSION OF ENVIRONMENTAL PROTECTION

PERMITTING LONGWALL COAL MINES IN PENNSYLVANIA

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July 2014

CITIZENS COAL COUNCIL

Photo: Color aerial photograph (2010) from the National Agriculture Imagery Program (NAIP), in the vicinity of Holbrook, Greene County, PA. The 1,867-acre surface facilities area associated with a proposed new longwall mine - known as Foundation Mine - is outlined in light blue. Only about one-third of the total surface facilities area actually needed for the new mine was divulged in the 2010 PADEP-CDMO coal mine application. The photo illustrates the forested and rural nature of the area, factors that contribute to the exceptional quality of Greene County's watersheds and the peaceful and serene character of its communities.

CITIZENS COAL COUNCIL

This report was prepared for the
Citizens Coal Council
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and two anonymous donors

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CITIZENS COAL COUNCIL

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GLOSSARY OF TERMS AND ACRONYMS USED IN THIS REPORT

401 Water Quality Certification	An approval issued by PADEP. A federal 404 permit may not be issued unless the PADEP first certifies that the activity complies with all applicable water quality standards, limitations, and restrictions; this approval is associated with Section 401 of the federal Clean Water Act.
404 Permit	A federal permit issued by the Corps of Engineers that authorizes the placement of fill material or the erection of structures in waters of the United States, including wetlands; it is associated with Section 404 of the federal Clean Water Act.
Act 54	Adopted during June 1994, Act 54 amended the 1966 Pennsylvania mining law known as the Bituminous Mine Subsidence and Land Conservation Act.
CCC	Citizens Coal Council, based in Bridgeville, PA, is a national advocacy group which works with and on behalf of communities affected by the mining, processing, and use of coal.
CDMO	California District Mining Office, the office of PADEP that issues permits for bituminous coal deep mine operations.
Chapter 86	The PADEP regulations associated with Surface and Underground Coal Mining; sometimes written 25 Pa. Code §86.
Chapter 89	The PADEP regulations associated with Underground Mining of Coal and Coal Preparation Facilities; sometimes written 25 Pa. Code §89.
Chapter 93	The PADEP regulations associated with Pennsylvania's Water Quality Standards; sometimes written 25 Pa. Code §93.
Chapter 105	The PADEP regulations associated with Dam Safety and Waterway Management; sometimes written 25 Pa. Code §105. Similar to a federal 404 permit, a Chapter 105 permit typically authorizes activities in waterways and/or wetlands.
Class A1 (or C4) Dam	Dams in Pennsylvania are classified according to their size (A-C) and their hazard potential (1-4) in the event of failure. A Class "A" dam is the largest of 3 size categories (Class "C" is the smallest) and #1 signifies the most significant hazard potential (a #4 dam entails the least hazard potential).

Corps (or Corps of Engineers)	The US Army Corps of Engineers is the lead federal agency responsible for issuing Section 404 permits under the Clean Water Act. The Pittsburgh District of the Corps has jurisdiction within the Ohio River Basin in western Pennsylvania.
Div. of Dam Safety	The PADEP Division of Dam Safety is based in Harrisburg; it is responsible for the planning, design review, construction review, maintenance monitoring, and supervision of dams and reservoirs.
Div. of Water Quality Standards	This PADEP Division is within the Bureau of Point and Non-Point Source Management; it is responsible for the monitoring and assessment of the quality of the Commonwealth's surface waters.
EIA	Energy Information Administration is an independent agency within the US Department of Energy. EIA collects, analyzes, and disseminates data about coal and other energy resources.
JD (or Corps JD)	Jurisdictional Determination. The Corps JD is the end result of a process whereby the Corps will review an applicant's delineation of wetlands and other waters on a property or project site. Once the Corps has confirmed the accuracy of the delineation and issued the JD, it can be relied upon for both state and federal regulatory and permitting purposes.
LiDAR	An acronym for Light Detection And Ranging; it is a remote sensing technology that measures distance and computes topographic elevations using a laser and analyzing the reflected light.
NPDES	The "National Pollutant Discharge Elimination System" is a permit program associated with the federal Clean Water Act for direct discharges to streams. The NPDES permit typically is issued by the delegated State agency (in Pennsylvania, PADEP). The NPDES permit sets specific limitations on the amount and type of pollutants allowed to be discharged at a specific location along a stream.
NWI Maps	The "National Wetlands Inventory" maps were prepared by the US Fish & Wildlife Service during the 1970s and 1980s from high-altitude aerial photographs to identify major wetland resources for nationwide planning and management of fish and wildlife habitat. Such maps occasionally are updated.
OSMRE	Office of Surface Mining Reclamation and Enforcement, a federal agency within the US Department of the Interior. OSMRE is responsible for federal regulation of coal mining operations, for cleaning up abandoned mine lands, and for oversight of state-level coal mining programs.

PADEP	Pennsylvania Department of Environmental Protection
RTKL	Right-to-Know Law; it provides Pennsylvania citizens access to public records, similar to the federal Freedom of Information Act.
SMCRA	Surface Mining Control and Reclamation Act is the federal law dealing with coal mining, enacted in 1977. The OSMRE was established under SMCRA.
"Special Protection" Waters	Surface waters that have been designated as either EV (Exceptional Value) or HQ (High Quality). Because they are the best waters in the Commonwealth, proposed activities that might impact them are supposed to be subject to a higher standard of review than activities affecting other waters.
TGD 563-2000-655	PADEP Technical Guidance Document # 563-2000-655, entitled "Surface Water Protection - Underground Bituminous Coal Mining Operations", was last revised 8 October 2005. It establishes procedures and provides guidance on how to identity and protect regulated surface waterways and wetlands from underground mining activities.
USEPA	United States Environmental Protection Agency

EXECUTIVE SUMMARY

The California District Mining Office (CDMO) of the Pennsylvania Department of Environmental Protection (PADEP) is responsible for the review of underground coal mine permit applications in southwestern Pennsylvania, including all longwall mine applications. During July 2010 an application (#30081301) for a new longwall mine, known as Foundation Mine, was submitted to the CDMO by Foundation Mining LLC. This was the first application for a new longwall mine submitted since Act 54 in 1994 legalized the subsidence damage associated with high-extraction underground coal mining in Pennsylvania. The Foundation Mine application was under active review by the State for three full years, until the applicant withdrew it during July 2013.

This report provides an in-depth, independent review of the Foundation Mine permit application and its review by the CDMO. This analysis provides a unique insight into the current regulatory review process involving longwall coal mines in Pennsylvania. It examines how well the current review process implements the laws and regulations adopted to protect environmental resources from coal extraction activities. This report uses the Foundation Mine application as a case study to determine how successfully the Pennsylvania Department of Environmental Protection requires an applicant to inventory resources at risk from a proposed longwall mine operation, predict potential impacts, and identify measures to minimize and address likely impacts in accordance with existing laws and regulatory requirements. The report also examines the adequacy and effectiveness of the State's mine permit application forms, technical guidance, and overall process in eliciting the information necessary to evaluate potential impacts and to demonstrate compliance with applicable laws and regulations.

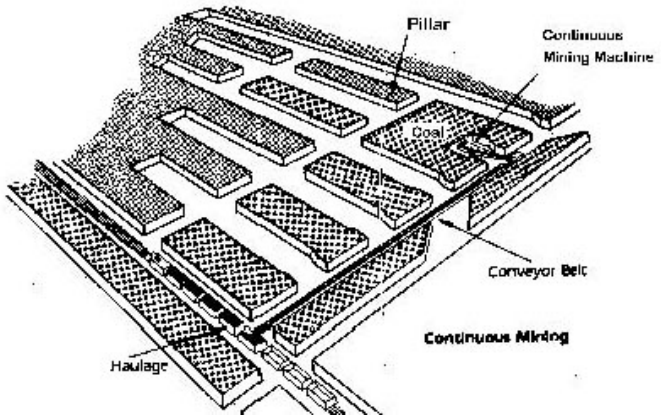
A formal request was filed under the Pennsylvania Right-to-Know Law (65 P.S. §§ 67.101 *et seq*.) on 12 September 2011 for all files and records relating to the proposed Foundation Mine. A follow-up request was filed on 10 January 2013. The many thousands of pages of files, correspondence, and reports which were obtained and examined provided the basis for this analysis.

This report is divided into two principal parts. The main section examines the primary issues associated with the regulation of a longwall mine operation --- matters that for the most part are not unique to the Foundation Mine, but which apply equally to other longwall coal mines in Pennsylvania and elsewhere in the United States. Recommendations for dealing with these issues are provided. The second part is a Module-by-Module review of the 2010 Foundation Mine application, which is presented in Appendix A. It details specific issues and concerns that we have identified --- including omissions, inconsistencies, and other problems with the information or assessments provided --- which can and must be resolved by CDMO if an application for Foundation Mine is ever resubmitted. Similar issues and concerns should be addressed in other longwall mining applications that are reviewed by the PADEP.

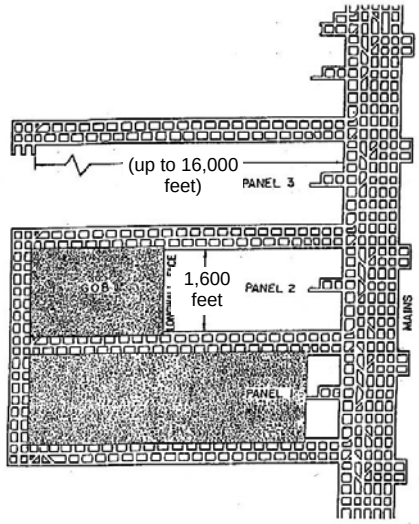
HISTORICAL BACKGROUND

Pennsylvania currently ranks 4th among all states in total coal production and 2nd among states with longwall coal mining (EIA 2013). Coal has been mined in Pennsylvania since the late 1700s. Historically, most underground coal mining in the Commonwealth has been done by the room-and-pillar method, whereby coal is left in place in pillars to prevent collapse of the mine roof and support the surface. By comparison, the longwall method of underground mining is relatively new, having first been introduced to Pennsylvania in the late 1960s. A modern longwall mine extracts all of the coal from a "panel" that can be up to 1,600 feet wide and 16,000 feet long, causing intentional subsidence when the overburden (rock temporarily supported at the working face) is allowed to collapse into the void.

ROOM-AND-PILLAR MINES (below left) extract about 50% to 60% of the coal, leaving some coal in place (in the pillars) to support the mine roof and prevent surface subsidence. **LONGWALL MINES** (below right) extract about 70% to 80% of the coal; they begin by using room-and-pillar methods to develop gates and entryways around the perimeter of a rectangular "panel" (up to 16,000 feet long and 1,600 feet wide), and then remove all of the coal within the panel, allowing the overburden to fall into the void as the operation advances, causing intentional surface subsidence.



ROOM AND PILLAR MINING



LONGWALL MINING

To date in Pennsylvania there have been 28 mines that have used longwall mining methods (**Table 1**). The earliest were Lancashire 24-D and Lancashire 24-B mines (both operated by Barnes and Tucker). Ten mines began incorporating longwall methods into their operations between 1967 and 1972. Most of the early longwall mines were in relatively thin coal seams like the Upper Freeport and the Upper and Lower Kittanning, and all of them were significantly smaller-scale operations than exist today. In 1970, the Gateway Mine became the first Pennsylvania longwall operation mining the Pittsburgh coal seam (PADEP 1999). All existing longwall mines today operate in the uniformly thick (approximately 5 to 9 feet) Pittsburgh coal seam.

TABLE 1. Longwall mines in Pennsylvania (data primarily from PADEP's three Five-Year Act 54 Review Reports). The five currently active mines are in **bold**.

Mine Name	Operation Began	Operation Ended	Company
Lancashire 24-D	1967	1985	Barnes and Tucker
Lancashire 24-B	1968	1971	Barnes and Tucker
Cambria 33	1968	1994	Beth Energy
Delmont	1969	1977	Eastern Associated
Gateway	1970	1990	Gateway Coal Co.
Lucerne 6	1970	1979	Helvetia
Lancashire 20	1971	1985	Barnes and Tucker
Florence #1	1972	1986	Florence
Blacksville No. 1	1972	1991	Consol
Jane	1972	1976	Keystone
Vesta	1973	1982	Vesta
Emilie 1 & 2	1974	1980	Keystone
Greenwich	1975	1989	Pennsylvania Mines
Mine 84	1976	2009[1]	Consol
Westland	1977	1981	Consol
Blacksville No. 2	**1977**	**Active**	**Murray Energy**
Maple Creek	1980	2003	Maple Creek Mining
Cumberland	**1981**	**Active**	**Alpha**
Humphrey No. 7	1982	1997	Consol
Emerald	**1982**	**Active**	**Alpha**
Homer City	1983	1992	Helen Mining Co.
Dilworth	1984	2002	Consol
Pursglove	1985	1989	Consol
Enlow Fork	**1986**	**Active**	**Consol**
Bailey	**1986**	**Active**	**Consol**
Warwick No. 3	1992	1996	Duquesne Light Co.
High Quality	1994*	2005[1]	UMCO Energy
Shoemaker	1999*	2005[1]	Consol

* Year approved by PADEP. Actual longwall mining began in a subsequent year.
[1] Although the permit has been renewed and remains valid, mining operations ceased during the stated year.

As of late 2013, there were 8 mines with current permits to conduct longwall mining in Pennsylvania. At the same time there were 43 permitted room-and-pillar coal mines in the Commonwealth. Each of the currently active longwall mines in Pennsylvania originally was approved between 1977 and 1986, and since then has been issued numerous renewals and revisions for expansions. No new longwall mine has been reviewed and approved by PADEP since passage of Act 54 in 1994. If it had been approved, Foundation Mine would have been the first, and its longwall panels would

have been larger than those at any of the currently active longwall mines in Pennsylvania.

A longwall mine is a huge industrial complex, encompassing widespread surface facilities and extensive underground operations. The various components of a longwall mine operation can cause significant short-term and long-term effects both in the area where actual mining occurs and in adjacent areas. The construction and operation of a coal mine potentially affect water supplies, water quality, air quality, the health and wellbeing of residents, and the welfare and cohesion of communities. Longwall coal mine operations affect surface waters and groundwater both directly and indirectly. Water quality can be impacted by direct discharges or by landscape and land use alterations associated with the mine. Changes to the hydrologic balance (including alterations of surface flow patterns in streams, springs, and wetlands and changes to groundwater levels and flow) can occur when surface facilities are constructed and when longwall subsidence causes physical changes to surface and subsurface lands and aquifers. Longwall mine subsidence has caused documented impacts to structures, wells, infrastructure, streams, and other surface features, which in turn affect landowners, residents, businesses, watersheds, and communities --- often for many months or years, and sometimes permanently.

Photo credit: Raymond Proffitt Foundation

Heaved and cracked streambed from longwall-induced subsidence

Adverse impacts from a longwall mine to people and to the environment, like those from any industrial development activity, rightfully should be kept to a practicable minimum. Where impacts are justifiably necessary and unavoidable, they should be mitigated fully. Minimization and mitigation of impacts can be done, however, only if all the features and resources at risk have been accurately identified and characterized prior to mining. State and federal laws and regulations have been adopted ostensibly to ensure that underground coal mines are constructed and operated in a responsible manner protective of the miners, the environment, and the residents of the land overlying the coal deposits. To that end, operators are required to conduct pre-mining inventories to identify resources at risk, to assess potential impacts in their permit applications, and to conduct post-mining inventories to identify actual impacts and to document their progress implementing appropriate restoration.

THE PROPOSED FOUNDATION MINE

A Bituminous Coal Underground Mine Application for Foundation Mine (#30081301) was received by the PADEP California District Mining Office on 2 July 2010. The applicant was Foundation Mining LLC, a division of Virginia-based Alpha Natural Resources. Alpha Natural Resources also currently is the parent company for two other longwall mines nearby: Emerald Mine and Cumberland Mine.

According to the 2010 application, the proposed Foundation Mine would extend beneath 9,438 acres of Greene County in southwestern Pennsylvania and would include 642 acres of surface facilities (**Figure 1**). This new mine proposed to use high-extraction longwall methods to remove bituminous coal from the Pittsburgh seam. **Table 2** provides key facts and dates for the Foundation Mine application.

Among the facilities proposed for the 642-acre surface area were (1) a shaft site consisting of a main pad, fans, utility boreholes, a bathhouse, diesel storage tank, parking, and associated stormwater and mine water treatment; (2) a portal opening (slope) with a main pad, conveyor drive tower and hoist house, track, dry shed, shop/maintenance building, diesel storage tank, and associated stormwater and mine water treatment; (3) a preparation plant with raw coal and clean coal silos, clean coal pad, transfer areas, stockpiles, a supply yard, and associated stormwater and mine water treatment; and (4) a batch weigh loadout area with an access road, conveyor wash down, soil stockpiles, and stormwater/sedimentation management.

Extraction of coal by longwall methods generally was not proposed beneath the mine's surface activity areas, but was proposed beneath the balance of the 9,438-acre underground mine area. The longwall panels were proposed to be 1,400 to 1,600 feet wide and 10,000 to 16,100 feet long. Depth of cover between the Pittsburgh coal seam and the surface was expected to range from 620 to 1,360 feet. The mine was projected to be active up to 20 years or more after extraction began.

As discussed in greater detail below, the CDMO would not have been able to approve a mining permit for the Foundation Mine unless and until major changes were made in the proposed project, in the demonstrations and justifications offered, and in the resource inventory information provided. The 2010 Foundation Mine application was remarkably deficient in a number of significant ways. The application as submitted to the CDMO failed to include (and thus failed to evaluate) certain major activities crucial to the operation of the proposed mine, including coal refuse disposal areas, several miles of new railroad siding, a 650 million-gallon water impoundment, a water withdrawal intake structure, and a 3.5-mile water supply pipeline. The application failed to identify many water resources at risk of damage from the proposed mine, and it was particularly deficient in the identification of wetlands within the mine permit area.

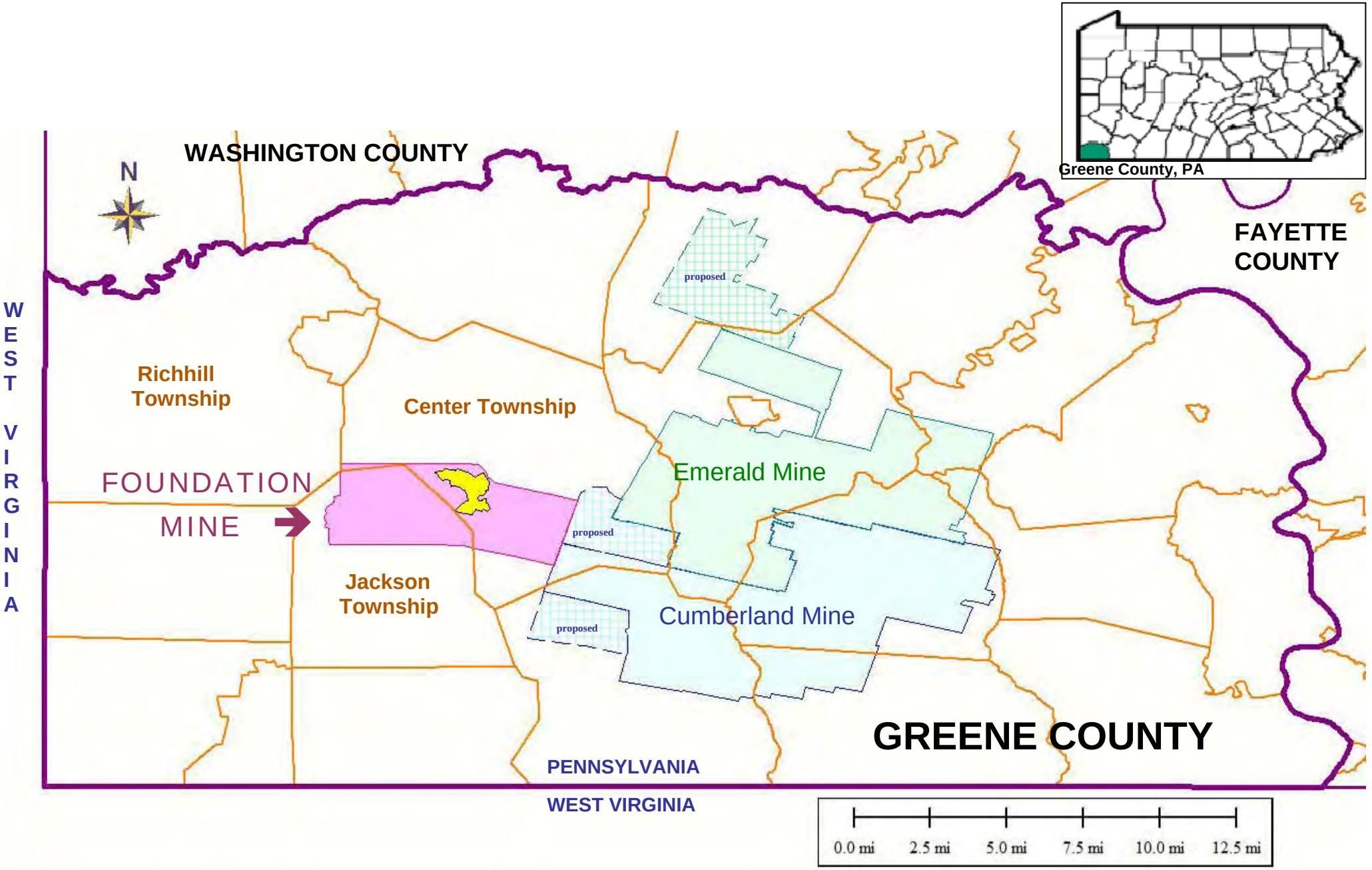


FIGURE 1. Location of proposed Foundation Mine in west-central Greene County, Pennsylvania. The proposed new underground mine (purple) encompassed 9,438 acres overall, of which the surface facilities area (yellow) encompassed 642 acres, according to the 2010 mine permit application submitted to the PADEP California District Mining Office (CDMO). Alpha Natural Resources is also the parent company of nearby Emerald Mine (green) and Cumberland Mine (blue). Municipal boundaries are orange.

TABLE 2. Significant facts and key dates regarding the proposed **Foundation Mine**.

Applicant: Foundation Mining, LLC
(a division of Alpha Natural Resources)

PA Underground Mine Application/Permit Number:	30081301
NPDES Permit Application Number:	PA0235741
Mine Location, County:	Greene County, Pennsylvania
Mine Location, Municipalities:	Center, Jackson, Richhill Townships
Proposed Surface Facilities Area:	642 acres per *Pennsylvania Bulletin*
Proposed Underground Permit Area:	9,438 acres
Proposed Subsidence Control Area:	6,768 acres
Proposed Method of Coal Extraction:	Longwall
Proposed Average Longwall Panel Width:	1,400 to 1,600 feet
Proposed Average Longwall Panel Length:	10,000 to 16,100 feet
Proposed Depth of Cover:	620 feet to 1,360 feet
Estimated Life of Mine:	15 to 20 years (+)
Anticipated annual raw coal production:	8.2 million tons
Mine Application received by CDMO:	2 July 2010
Appl. accepted by CDMO for Technical Review:	17 November 2010
Mine Application Noticed in *PA Bulletin*:	4 December 2010
Informal CDMO Public Conference held:	16 February 2011 (Rogersville, PA)
"Revision 1" of Mine Application Submitted:	3 July 2012
CDMO Mine Application Withdrawn/Returned:	2 July 2013
DEP Dam Safety Applications Withdrawn/Returned:	July 2013
<u>Other Related Applications</u>	
Public Notice of Corps 404 application:	6 February 2012
Dam Safety applications noticed in *PA Bulletin*:	1 September 2012
Corps JD issued for 1,867 surface acres:	14 November 2012
Schmid & Company 1st File Review at CDMO:	29 November 2011
Schmid & Company 2nd File Review at CDMO:	12 March 2013

The July 2010 mine application was supplemented/revised twice in response to initial PADEP-CDMO comments. The first revision was on 25 August 2010. The second revision was submitted on 9 November 2010. It then was deemed administratively complete on 17 November 2010.

On 3 July 2012 a revision of the mine application was submitted to the PADEP-CDMO (received 5 July 2012). This "revision" (which addressed a major water impoundment facility) was not logged in, nor was it given any administrative or technical review by CDMO. Instead, it was put aside and its review was not planned to begin until after the original underground mine permit had been issued, at which time it would be reviewed and eventually approved as "Revision 1".

On 2 July 2013, the underground mine application was withdrawn/returned. The State Dam Safety applications also were withdrawn during July 2013. The Corps 404 application still was under review as of June 2014.

The application failed to acknowledge the full probable extent of impacts to streams, wetlands, and groundwater associated with the proposed coal mine. The application failed to adequately or accurately predict potential impacts to structures, water resources, and the hydrologic balance based on information and experience gained from longwall mining in Pennsylvania and other states during the 20 years since passage of Act 54. The application failed to adequately characterize the Special Protection nature of the watersheds in which mining activities were proposed, to justify the direct impacts to many miles of Special Protection waters from surface facilities, or to acknowledge the potentially permanent subsidence damage to many additional miles of Special Protection waters.

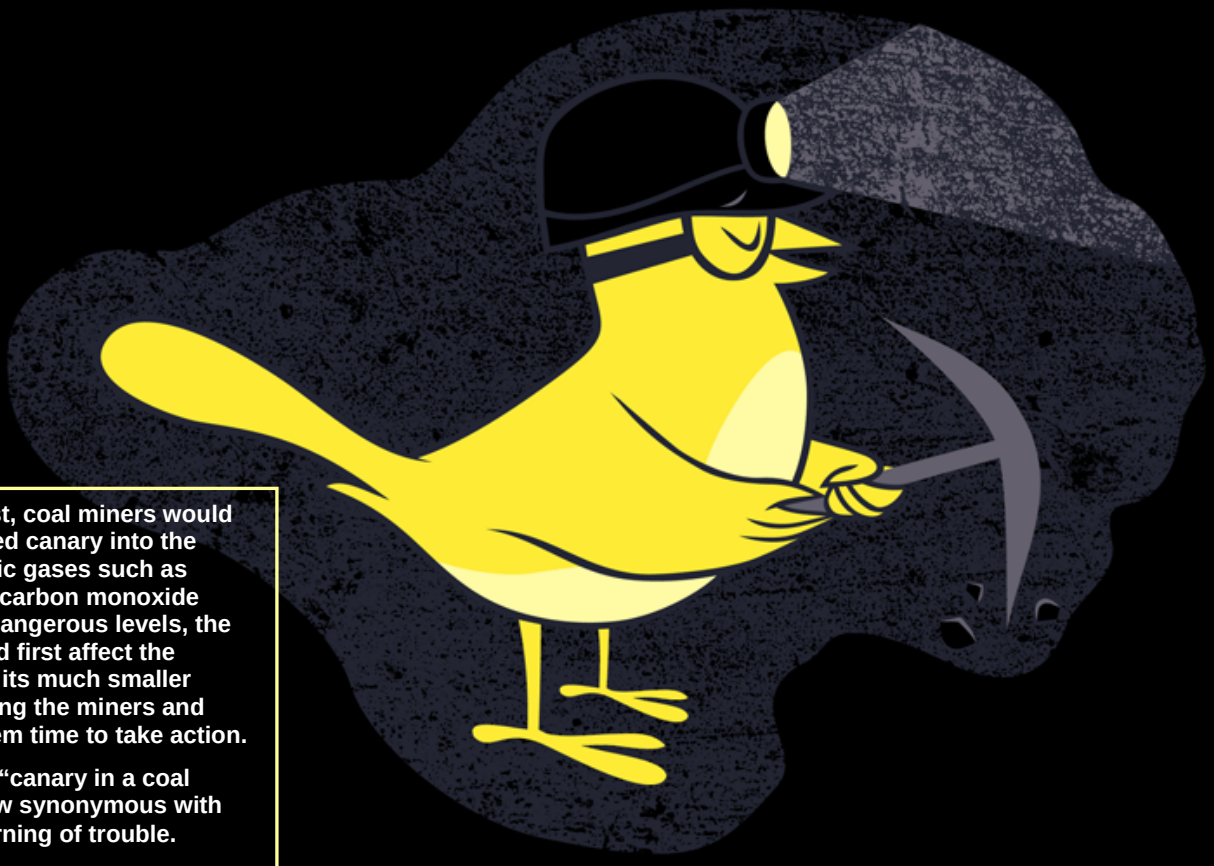
This report concludes that the failure of the Foundation Mine application to fully and accurately identify resources at risk and to evaluate potential impacts can in large part be attributed to deficiencies in the State's application forms and in the PADEP review process itself. Technical review was undertaken despite the fact that many of the application form "Modules" submitted with it were outdated versions that did not incorporate the most-current technical guidance available when the application was filed in 2010. Even the most recent Modules do not track well with the legal and regulatory requirements that the PADEP is supposed to apply to every underground coal mine application. The many deficiencies and issues identified in this report will have to be remedied and addressed effectively before any final decision could be made to approve a revised Foundation Mine application.

WHO SHOULD READ THIS REPORT

This report should be of value and interest to the following groups or individuals:

- ☑ **PADEP** (to supplement its standard permit application review process; to correct deficiencies in and improve the effectiveness of the mining regulatory program)
- ☑ **Citizens Advisory Council** (because of its legislative mandate to review each of the five-year Act 54 Reports and its mission to ensure that all Commonwealth citizens enjoy the benefits included in Article I, Section 27 of the Pennsylvania Constitution)
- ☑ **Mine Operators** (to supplement and improve their normal process for preparing permit applications)
- ☑ **US-OSMRE** (to recognize and address issues of concern with the Pennsylvania mining program and ongoing conflicts with SMCRA)
- ☑ **US-EPA, Army Corps of Engineers** (to recognize and address conflicts with the Clean Water Act)
- ☑ **County and Municipal Officials** (to better understand potential land use conflicts within their jurisdictions)
- ☑ **Environmental Groups** (to understand the scope of environmental issues associated with longwall coal mining operations and the relevance to larger issues such as clean water, clean air, and climate change)
- ☑ **Coalfield Residents** (to understand the limitations of the existing regulatory process; to understand potential impacts to their property and lives)
- ☑ **Regulatory Agencies in Other Coal States** (to supplement their review processes; to improve effectiveness of their mining regulatory programs)

MAJOR REGULATORY ISSUES OF CONCERN



In times past, coal miners would bring a caged canary into the mine. If toxic gases such as methane or carbon monoxide built up to dangerous levels, the fumes would first affect the canary with its much smaller lungs, alerting the miners and allowing them time to take action.

The phrase "canary in a coal mine" is now synonymous with an early warning of trouble.

MAJOR REGULATORY ISSUES OF CONCERN

Nine major issues of concern with the PADEP's permit review process are illustrated by the 2010 Foundation Mine application. Some of these concerns arise from the specifics of this application. Most, however, are a result of incomplete, contradictory, or confusing guidance displayed in the State application Modules for an underground mine permit and arising during the State review process itself.

When a mine permit application is submitted to the CDMO, it first undergoes an administrative completeness review. CDMO staff check that the relevant forms (Modules) were submitted and determine whether enough information has been included to allow technical review to proceed. There may be one or more rounds of comments and responses between the CDMO and the applicant before the application is deemed "complete". At that point, notice of the application is published in the *Pennsylvania Bulletin* and technical review is undertaken by staff engineers, geologists, and biologists. Technical deficiencies and comments by the various CDMO staff are compiled in a technical review letter and sent to the applicant to address. If all outstanding issues have not been adequately addressed or resolved, a second (and perhaps a third) technical review letter will be sent out. Once all issues have been adequately addressed, the permit can be issued.

A permit to mine coal must abide by numerous Commonwealth laws and regulations, including the following:

Laws:

Surface Mining Conservation and Reclamation Act (P.L. 1198, No. 418), as amended
Air Pollution Control Act (P.L. 2119, No. 787), as amended
Bituminous Mine Subsidence and Land Conservation Act (P.L. 31), as amended by Act 54
Clean Streams Law (P.L. 1987, No. 394), as amended
Coal Refuse Disposal Control Act (P.L. 1040, No. 318), as amended
Dam Safety and Encroachments Act, Act of November 26, 1978

Regulations in 25 Pennsylvania Code:

Chapter 86: Surface and Underground Coal Mining, General
Chapter 89: Underground Mining of Coal and Coal Preparation Facilities
Chapter 93: Water Quality Standards
Chapter 105: Dam Safety and Waterway Management

Because PADEP has been granted primary responsibility (“primacy”) by the US Department of the Interior, Office of Surface Mining Reclamation and Enforcement (OSMRE) for regulating coal mining activities within the Commonwealth, State approval of a mine application also constitutes federal approval under the Surface Mining Control and Reclamation Act of 1977 (SMCRA).

A PIECEMEALING OF MINE ACTIVITIES AND IMPACTS

A1 - Proposed Mine Operation Split Among Separate Applications

As the technology for the longwall method of underground mining has advanced over the past several decades, it has become clear that a modern longwall coal mine represents an enormous industrial operation which can have significant short-term and long-term impacts due to its various surface facilities and underground activities. Unless all of the components of a proposed operation are clearly identified and evaluated together, however, a complete picture of the mine project and its associated impacts cannot be determined. If a major new longwall coal mine is reviewed and approved as a series of small projects, the overall impacts of the ultimate operation are not made clear to the public, and opportunities to avoid or minimize impacts are overlooked.

The subject Foundation Mine application was submitted to the PADEP California District Mining Office on 2 July 2010. The submission was twice supplemented (through November 2010) in response to initial review comments by the CDMO. The application then was deemed administratively complete, public notice of it was published in the *Pennsylvania Bulletin* on 4 December 2010, and technical review by the CDMO began.

> More than 2 years earlier, during February 2008, the CDMO had received an application from Foundation Mining LP for a new 9,438-acre longwall mine and NPDES approval. That application subsequently was withdrawn by the applicant, and all associated materials were formally returned by the CDMO on 20 April 2009.

The 2010 application for Foundation Mine consisted of two major components:

- Proposed Underground Mine: 9,438 acres
- Proposed Surface Facilities: 642 acres (within the 9,438 acres).

Because there were several wastewater or stormwater discharges proposed to streams, the mine application included an application for an NPDES [National Pollutant Discharge Elimination System] permit[1]. Because of proposed direct impacts to wetlands and streams, the mine application also included a request for Section 401 water quality certification[2].

Inexplicably, however, the Foundation Mine application included no coal refuse disposal areas (CRDAs), even though the proposed coal preparation plant was

[1] Under Section 402 of the federal Clean Water Act (CWA), the US Environmental Protection Agency has authorized PADEP to administer National Pollutant Discharge Elimination System (NPDES) permits in Pennsylvania.

[2] Under Section 401 of the CWA, if a project involves discharges (of fill or other pollutants) to regulated wetlands or other waters of the United States, the State must certify that those discharges will be consistent with its water quality standards before a federal permit can be approved by the Army Corps of Engineers.

expected to process more than 8 million tons of raw coal annually, and thus would produce many tons of waste material that were not proposed to be returned underground. This major omission, plus several others, came to light more than a year later when Foundation Mining LLC filed an application with the Pittsburgh District of the US Army Corps of Engineers for a federal Section 404 permit.

Corps of Engineers CWA Section 404 Application (CELRP-OP-F 2007-891)

The 404 permit application ostensibly was for the exact same longwall mine project, yet it included additional surface facilities for the Foundation Mine that were not, and never were, incorporated into the 2010 State mine application.

- Submitted by Foundation Mining LLC during early 2012 (published as Pittsburgh District Public Notice No. 12-4 on 6 February 2012)
- The proposed Surface Facilities Area of 1,867 acres was 1,225 acres larger than the 642 surface acres acknowledged in the mine application submitted to the CDMO (**Figure 2**). The underground mine area of 9,438 acres was the same as in the State mine application.
- The additional 1,225 acres of surface disturbance encompassed 2 coal refuse disposal areas, 3.2 miles of new railroad sidings, a 650 million-gallon water impoundment, a water withdrawal intake structure on South Fork Tenmile Creek, a 3.5-mile long process water pipeline, and numerous large soil stockpiles and sediment ponds.

Given the high probability of damage to its industrial facilities by subsidence, longwall extraction generally is not conducted beneath a mine's surface facilities. The layout of longwall panels presumably would need to be revised significantly from what was proposed in the 2010 State mine application if the additional surface activities on 1,225 acres were to be constructed as proposed in the 404 permit application.

Federal Clean Water Act Section 404 approval of any project is contingent, in part, on the State granting Section 401 water quality certification for any and all impacts to wetlands and other "Waters of the US" identified in the 404 application. Although the 2010 State mine application included a request for Section 401 water quality certification, that request did not cover the additional impacts to streams and wetlands identified in the expanded Surface Facilities Area of the federal 404 permit application.

According to Module 15 in the State underground mine permit application, the activities proposed in State and federal applications must be consistent. Form 15A (in Module 15) states that "*If the scope of activities described under the federal permit application differs from the scope of activities described under the state permit application, attach a copy of the federal permit application*". The (undated) Form 15A for Foundation Mine noted that a Corps Individual Permit was "pending", although that Corps 404 application apparently was not *submitted* until more than a year after the 2010 State mine application was submitted. Form 15A states that any substantial

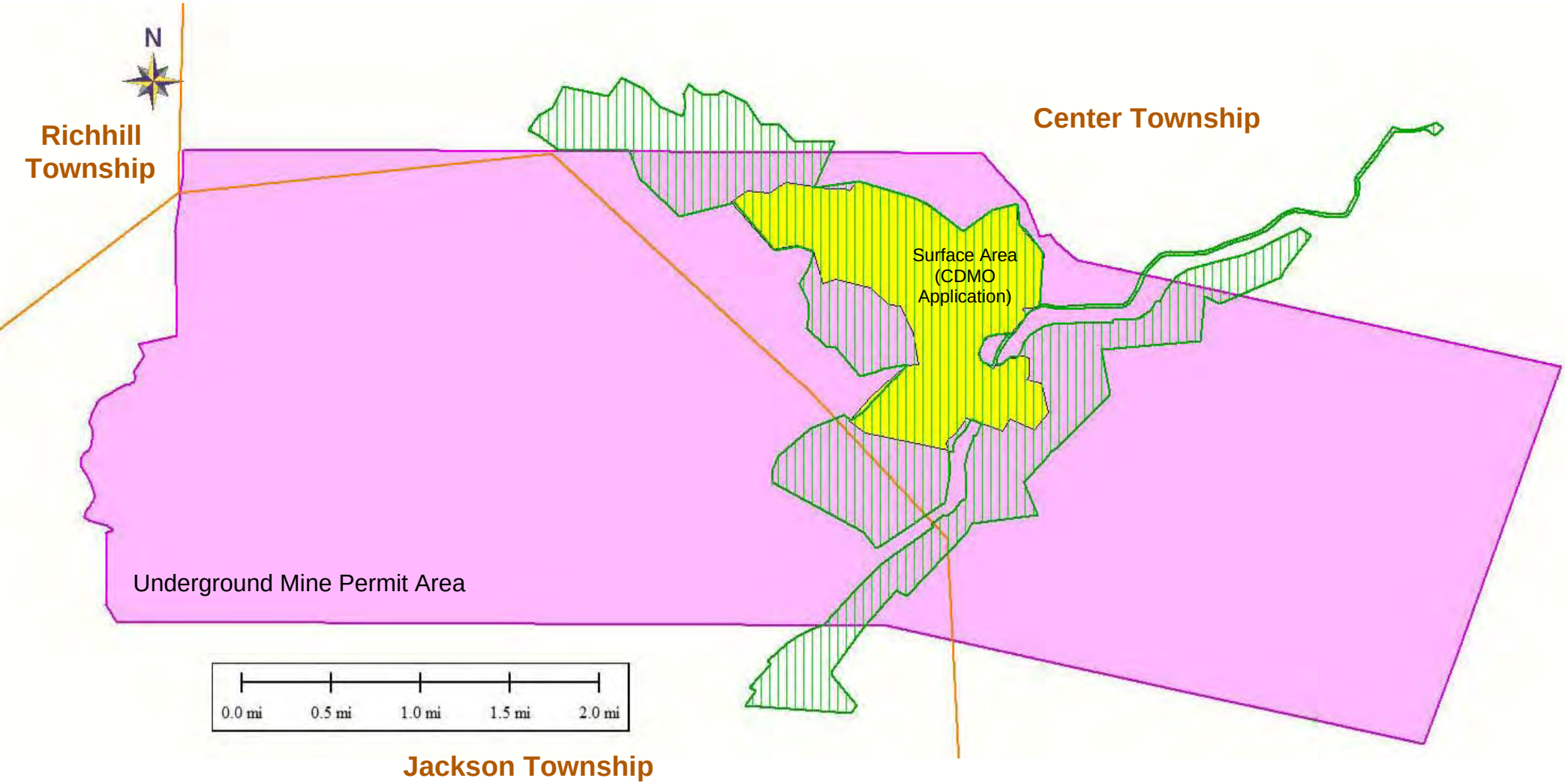


FIGURE 2. Comparison of the surface facilities area proposed for Foundation Mine according to the 2012 Corps 404 permit application (green outline and vertical hatching; which encompasses 1,867 acres) with the surface facilities area identified in the 2010 State mine application (yellow; 642 acres). The surface area per the Corps application also extends beyond the underground mine permit area (purple; 9,438 acres) which is the same in both applications.

revisions per a federal application must be provided to the District Mining Office. No copy of the federal permit application was found in the CDMO files provided during our November 2011 or March 2013 file reviews. Reportedly, the applicant did provide a complete copy of the Corps 404 application to the CDMO, but the CDMO promptly *returned* it, explaining that it was of no interest to the State's reviewers.

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At least two separate State applications subsequently were submitted by Foundation Mining LLC for some of the additional surface facilities associated with the Foundation Mine project. However, the 2010 State mine application was never officially revised or updated to reflect or address any of those proposed activities, nor to acknowledge and evaluate the significant impacts associated with them.

Dam Safety Applications (D30-079 and D30-080)

The PADEP expertise for dam engineering is in the Dam Safety program in Harrisburg, so it makes sense for that office to review that aspect of a coal mine project. The evaluation of dam safety issues, however, must feed into and become part of the overall review by the CDMO, and not be performed in a vacuum separate and apart from the assessment of the entire coal mine project. But for the proposed coal mine, there would be no need for the proposed dams, and but for these dams, the proposed Foundation Mine could not function adequately.

- Submitted by Foundation Mining LLC to PADEP Division of Dam Safety, Harrisburg, 31 May 2012 (published in *Pennsylvania Bulletin* 1 September 2012). These applications were withdrawn during July 2013.
- One Dam Safety application was for a Class A1 earthfill dam 183 feet high and 1,130 feet long to contain a 650 million-gallon water impoundment
- The other Dam Safety application was for a Class C4 earthfill dam 18 feet high and 240 feet long for a sediment pond
- Both of these onstream dams/impoundments are needed for the coal preparation plant operation (both were included in the Corps 404 permit application, above)
- These facilities will directly impact at least 12,441 linear feet of Special Protection (High Quality - Warm Water Fishery) waters and 0.01 acre of wetland, in addition to the more than 13,000 linear feet of streams and 0.65 acre of wetlands acknowledged in the mine application submitted to the CDMO.

Revision #1 of Underground Mine Application (#30081301)

Two years after the original mine application was submitted, information about the necessary dam and major water impoundment finally was submitted to the CDMO, intended as "Revision 1". However, this information was not incorporated into the ongoing review of the proposed Foundation Mine.

- Submitted to PADEP-CDMO, July 2012 (not published in *Pennsylvania Bulletin* because it was never reviewed for administrative completeness)
- This application was for the same surface activities as the Dam Safety applications, above; in particular, a dam 183 feet high and 1,130 feet long to contain a 650 million-gallon water impoundment.
- The CDMO had intentionally set this revision aside and was not considering it as part of its review of the Foundation Mine (indeed, it was not even reviewed for administrative completeness) until after review of the original mine application had been completed (and presumably, approved).
- This "revision" did not address the need for coal refuse disposal areas (CRDAs) --- 265 acres of additional mine-related facilities that already had been planned and designed and were part of the 2012 federal 404 permit application (a third CRDA also was said to be needed but was not designed). No separate CRDA application was ever filed with the CDMO for Foundation Mine.

Current practice by the CDMO is to allow longwall mines to increase in size incrementally through permit revisions, which may number in the hundreds over a period of several decades and cover thousands of additional acres beyond the land initially proposed for mining. The 25 *Pa. Code* Chapter 89 regulations may bear some of the blame for the piecemealing of coal mine projects. For example, in §89.141, the subsidence control plan can at minimum address areas that will be affected by subsidence "*which will occur during the 5-year term of the permit*". No disclosure is prompted for any information on the ultimate extent of a coal mine in relation to the operator's holdings. The 2010 Foundation Mine application to the CDMO did not even include all of the approvals needed for it to operate for its initial five years.

By allowing this major new longwall coal mine project to be split into smaller parts, and by reviewing each component separately, PADEP not only was violating its own stated mission[3] but also was diluting its regulatory responsibilities for the mining program over which the federal Office of Surface Mining Reclamation and Enforcement retains oversight.

<u>Recommendation</u>: All of the most up-to-date information about a proposed mine that is reasonably foreseeable, including at minimum the same information contained in a Corps 404 application and PADEP Dam Safety applications, must be incorporated into an underground mine application to be reviewed by the CDMO prior to permit approval. Information provided in prior mine applications would need to be updated and reanalyzed so that all of the proposed impacts are acknowledged and evaluated together.

[3] *The Department of Environmental Protection's mission is to protect Pennsylvania's air, land, and water from pollution and to provide for the health and safety of its citizens through a cleaner environment. We will work as partners with individuals, organizations, governments and businesses to prevent pollution and restore our natural resources.* http://www.depweb.state.pa.us/portal/server.pt/community/about_dep/13464

A2 - Piecemealing Understates Mine Project Impacts

The stream and wetland impacts that were acknowledged in the State underground mine permit application are only a small fraction of the stream and wetland impacts actually known to be associated with the Foundation Mine project. In part, as mentioned above, this is because the CDMO failed to require that the application include all major surface activities crucial to the operation of the proposed mine, such as coal refuse disposal areas and a 650 million-gallon water impoundment.

Among the three separate applications pending at the time, the Corps 404 application most fully identified the activities and impacts associated with the proposed Foundation Mine. The following were the principal significant differences between the State and Federal permit applications and their acknowledged impacts:

	PADEP Underground Mine Application (CDMO)	PADEP Dam Safety Application	Corps 404 Application
Surface Activities Area	642 acres	223 acres	1,867 acres
Stream Impacts	13,423 linear ft.	12,441 linear ft.	63,626 linear ft.
Direct Wetland Impacts	0.65 acre	0.01 acre	1.304 acres

It is clear from the list above that, even if the activities/impacts of the two separate State applications were added together, they still would not have accounted for all of the regulated activities/impacts included in the federal 404 application for the Foundation Mine. The surface activities area as described in the 404 application was almost three times larger than the surface activities area described in the CDMO mine application. (The underground mine permit area, encompassing 9,438 acres, was the same in both the State mine application and Federal 404 application, although the primary focus for review in both cases was on resources directly impacted by surface facilities, the areas of which differ significantly, see Figure 2.) Some of the surface disturbance areas in the federal application are outside the 9,438 acre mine permit area. The number of linear feet of stream impacts acknowledged in the 404 permit application (within the surface activities area) was nearly 5 times more than what was acknowledged in the CDMO underground coal mine application.

Some effects go beyond the direct impacts caused by facility construction. For example, the coal refuse disposal areas that were not included in the CDMO application for Foundation Mine would have impacts beyond those to the streams and wetlands directly affected by their construction. After being mined, the coal would need to be processed, refined, and “cleaned” at the preparation plant before being shipped to coal-fired power plants or steel mills. Toxic chemicals are used in the process of separating the useable coal from the unwanted refuse materials, which include pyrite and sulfur compounds, waste rock, and various heavy metals associated with those materials. Refuse impoundments have been known to leak or breach, which can introduce harmful substances into the nearby land, groundwater, or surface water. Chronic exposure to the metals found in coal refuse can cause health problems. None of those potential impacts was evaluated by the CDMO for the Foundation Mine.

A3 - Other Necessary Approvals Not Acknowledged

Other approvals needed to operate the Foundation Mine were identified in an attachment to Item #26 of the Corps 404 Application ("Other Certifications or Approvals", **Figure 3**). That list, though itself incomplete, included eleven other permits and approvals needed for the Foundation Mine operation, along with the agency responsible for review and its application status. The underground mine application submitted to the CDMO during July 2010 was referred to by the Corps in that list as the "SMCRA Permit". The PADEP Dam Safety application for the water supply impoundment (submitted to PADEP in Harrisburg, not the CDMO) was among those listed in Item #26. Another CDMO approval (Alternatives Analysis for Coal Refuse Disposal) was noted as having been applied for in March 2008 and approved in August 2011, although there was no information at all about that approval in the CDMO files provided for this review. The authors of this review do not know whether the refuse disposal alternatives files were lost, misfiled, or withheld by PADEP in response to our Right-to-Know Law requests. Whether that information played any role in the CDMO review of the mining application is unknown.

Approvals for wetland and stream impacts were said (in the 2012 Corps 404 application) to be needed from the PADEP Southwest Regional Office (SWRO) in Pittsburgh. Yet there was no coordination between the CDMO and the SWRO. The proposed relocation of Hoge Run, any proposed stream restoration work, and proposed new railroad facilities at minimum would need to satisfy Chapter 105 requirements, and the SWRO routinely reviews projects for compliance with Chapter 105. Likewise, no application had been submitted to the PA Fish and Boat Commission for a water access license for the necessary water intake structure that is needed on South Fork Tenmile Creek according to the 404 application says. An Air Quality Permit for the project and an NPDES permit for proposed sanitary facilities also would be required, but had not been applied for.

As mentioned above, a major approval that would be needed for the Foundation Mine project is for coal refuse disposal. No application for coal refuse disposal has yet been submitted to the CDMO for the proposed Foundation Mine; in Module 10 the applicant specifically noted that coal refuse disposal was not part of this 2010 mine application. However, the Operation Plan noted that coal would be prepared and cleaned before being shipped out, which activities necessarily would generate coal refuse. The Corps 404 Application identified two sites selected for coal refuse disposal. The construction of those two sites --- Site CR-1B (58 acres) for coarse coal refuse disposal, and Site R3 (207 acres) for a slurry impoundment --- would permanently impact more than 30,000 linear feet of HQ streams and 8 wetlands. It was noted that a third site, comparable in size to CR-1B, also would be needed, but no third site had been identified or evaluated in the federal application (much less the State application). The Corps cannot issue its federal 404 permit for the stream and wetland impacts associated with the proposed coal refuse disposal areas (or for *any* disturbances to wetlands and waters identified in the Corps 404 application) until

BLOCK 26 ATTACHMENT

AGENCY	TYPE APPROVAL	ID NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
PADEP – California District Mining Office	SMCRA Permit (proposed surface facilities except the railroad track sidings)	3081301	July 2, 2010	Pending	
	Coal Refuse Disposal – Alternatives Analyses	Sites CR-1B & R-3	March 12, 2008	August 18, 2011	
	Coal Refuse Disposal Permit(s)	Sites CR-1B & R-3			
	Stream Restoration Activities				
PADEP – Dam Safety	Dam Permits (slurry and water supply impoundments including associated sediment ponds if applicable)				
PADEP – SW Regional Office	Railroad – Chapter 105 Permit and 401 Water Quality Certification				
	Stream Restoration Activities - Chapter 105 Permit and 401 Water Quality Certification				
PA Fish & Boat Commission	Approval of Water Intake				
MSHA	Approval (slurry and water supply impoundments including associated sediment ponds if applicable)				
PennDOT	Highway Occupancy Permit(s)				
Greene County Conservation District	Railroad – NPDES/E&S Plan Approval				

FIGURE 3. Applicant's attachment to Item 26 in the 2012 federal application for a Corps Section 404 permit, which requests a list of other permits or approvals needed. The need for NPDES discharge permits was not mentioned in this list. Information about other approvals needed for the Foundation Mine project was not sought by the CDMO, and in fact was almost entirely disregarded, in the 2010 State underground mine permit application.

after the State has specifically issued its Clean Water Act Section 401 approval for each of them. That is unlikely now that the State mine application has been withdrawn. Whether the CDMO was planning to approve the 401 Water Quality Certification without receiving any application for the additional facilities is not clear.

A4 - Federal/State Coordination Lacking

The piecemealing of the review of the essential elements of this underground mine operation by the CDMO might be more understandable if the various offices of PADEP and the federal agencies had been carefully coordinating their efforts with one another. This apparently was far from the case with the Foundation Mine application.

On 9 March 2012 we contacted the CDMO to find out whether the underground mine application for Foundation Mine had been revised to reflect the new information contained in the Corps 404 Individual Permit Application which had become publicly available the previous month. We were told that there had been a large box of documents lying around the CDMO offices for a while that contained a copy of the Corps application, but it was sent back to the applicant because the federal application is of no use to the CDMO. This action subsequently was corroborated by CDMO staff several times on separate occasions. Clearly it defeats the applicant's apparent attempt to comply with the requirement of Form 15A (Module 15), which directs that when the proposed scope of activities in the federal and state permit applications differ, the State application is to be updated to reflect any changes made in the federal application. We also were told that a coal refuse application was expected to be filed separately; presumably it would have been treated by the CDMO as a separate permit revision rather than as part of the overall mine application.

Evidence of some interagency coordination, which <u>is</u> found throughout the Corps 404 application, was missing entirely from the Foundation Mine application files provided by the CDMO for this review. According to a Corps representative, the Individual 404 Permit application had been submitted to the Corps following pre-application meetings held several months earlier with the applicant and representatives from the CDMO. The 2012 Corps 404 permit application noted that a Jurisdictional Determination field inspection, "*attended by officials from PADEP-CDMO*" was conducted in May/June 2011 "*following several joint agency coordination meetings*". While it is commendable that this coordination took place, there was nothing in the CDMO files (reviewed 29 November 2011 and 12 March 2013) documenting any outcome from those joint agency meetings or even indicating that they had occurred.

In addition there apparently was considerable interagency coordination regarding the coal refuse site selection process. Inexplicably, no documentation regarding that coordination was contained in the CDMO files. An 18 August 2011 letter (included in the files obtained from the Corps) from Joel Koricich (CDMO) to Chester Huff (Alpha Natural Resources) advised the applicant that he may proceed with the coal refuse

disposal application process. The letter noted that a Coal Refuse Disposal Site Selection Report had been accepted by PADEP during August 2009[4]. That letter was copied to other State and federal agencies that apparently were involved with the coal refuse disposal site selection process, but no correspondence with those other agencies, nor the 2009 Report, nor the 18 August 2011 letter itself was found in the CDMO files provided for this review under formal Right-to-Know Law requests.

Even within the PADEP itself, review and coordination of the various aspects of the Foundation Mine project were lacking. As noted above, during July 2012 the CDMO received a "revision" of the underground mine application regarding the major water supply impoundment, but had set it aside and planned not to review it until after the original mine application had been approved. The 2012 permit applications submitted to the PADEP Division of Dam Safety in Harrisburg were never copied to the CDMO. The Division of Dam Safety had sought comments from other PADEP offices (such as the regional office in Pittsburgh) and sister agencies (such as the PA Fish & Boat Commission), but apparently had not contacted the CDMO.

Recommendation: At the time of filing, underground coal mine applications need to include all of the activities known to be associated with the proposed operation so that the full extent of related impacts can be identified and evaluated. If a mine application is withdrawn and subsequently resubmitted, the latest version of each applicable Module must be used.

A5 - Impacts of Future Expansions Not Evaluated

Historically, the initial CDMO permit for a longwall mine authorizes an operation with a relatively small footprint. Eventually the mine encompasses many dozens of square miles after subsequent expansions. This likely would have been the case with Foundation Mine as well. Each mine expansion, therefore, represents another type of piecemealing, because the effects of each subsequent revision are evaluated separately, not cumulatively. For example, the initial longwall mine permit for Consol's Bailey Mine was issued in 1985; by May 2014, there had been 180 formal revisions (not all of them expansions) approved by the CDMO, and the mine operation encompassed more than 59 square miles. Similarly, since its approval in 1986 for a mining footprint of less than 5 square miles, 117 specific revisions had been approved for Consol's Enlow Fork Mine as of October 2013, which by then encompassed about 55 square miles.

Each expansion typically is "justified" in part on the basis of the existing (initially approved) mine being where it is, and the expansion thus would be the most logical

[4] The cover page of that report provided the following revision dates: November 2008, March 2009, August 2009, March 2010, October 2010, and August 2011, which suggests that it had been under development (and likely under review by the various agencies) for at least 3.5 years.

and efficient place to expand. This self-serving reasoning employs circular logic. Mine operators know upfront where their coal reserves are located and approximately how long it will take to extract them given expected market demand for coal. For long-range planning purposes they need to know the basic layout, not only of the original mine, but of future expansions as well. Just as with a housing development being constructed in several phases, underground mines should be required to identify and evaluate the impacts not merely of the currently proposed layout, but of all likely future expansions of the mine operation as well, if the environmental and social impacts of the "mine" are to be properly evaluated by PADEP and the affected public.

For the most part, the 2010 State application described a 20-year underground coal mine operation. The applications submitted for Foundation Mine to the CDMO and the Corps both stated that underground mining would occur beneath 9,438 acres. The limits of the underground mine area, as shown on many of the maps included in the applications, encompass the same 9,438 acres. There are unexplained indications, however, regarding future planned expansions. The Refuse Disposal Alternatives Analysis in the 404 application stated (on page 6 in Section 3.0, Main Report): "*Mining within **the initial 9438-acre area** will occur over a period of approximately 10 years"* which suggested a much larger mine by the end of the 20-year period. Also, Module 10 (Operation Plan) in the July 2010 CDMO application stated that the coal preparation plant had an estimated life of 32 years, although that was changed to 20 years in a revision several months later. Information provided in a recent Commonwealth Court case[5] also suggests a much larger operation:

> Foundation Coal is the owner of massive coal reserves in Greene County ..... covering approximately 45,000 acres. ..... Foundation Coal estimates that its coal mining operations at the Foundation Mine will continue for about 40 years once actual coal extraction has begun.

A close examination of some of the maps in both the State underground mine application and the federal 404 application identified proposed mining that extended far outside the 9,438-acre area (**Figure 4**). Some maps identified areas designated for future mining (e.g., "*Years 21 to 25*" on Drawing 22.4). It is unacceptable that an application for a <u>new</u> mine did not clearly identify the maximum ultimate extent of the proposed operation (relative to unmined resources or the applicant's mineral holdings), even if all of the specific details of future expansions were not known at the outset. Without full disclosure of what was to be done and where, and over what period of time, the reviewing agencies (much less members of the public who will be directly and indirectly affected) cannot not understand the project well enough to make an informed decision regarding its relative benefits and impacts.

[5] Foundation Coal Resources Corporation, Pennsylvania Land Holdings Corporation, and Realty Company of Pennsylvania, Petitioners vs. Department of Environmental Protection and Penneco Oil Company, Inc., Respondents. No. 619 C.D. 2009. Argued 14 October 2009.

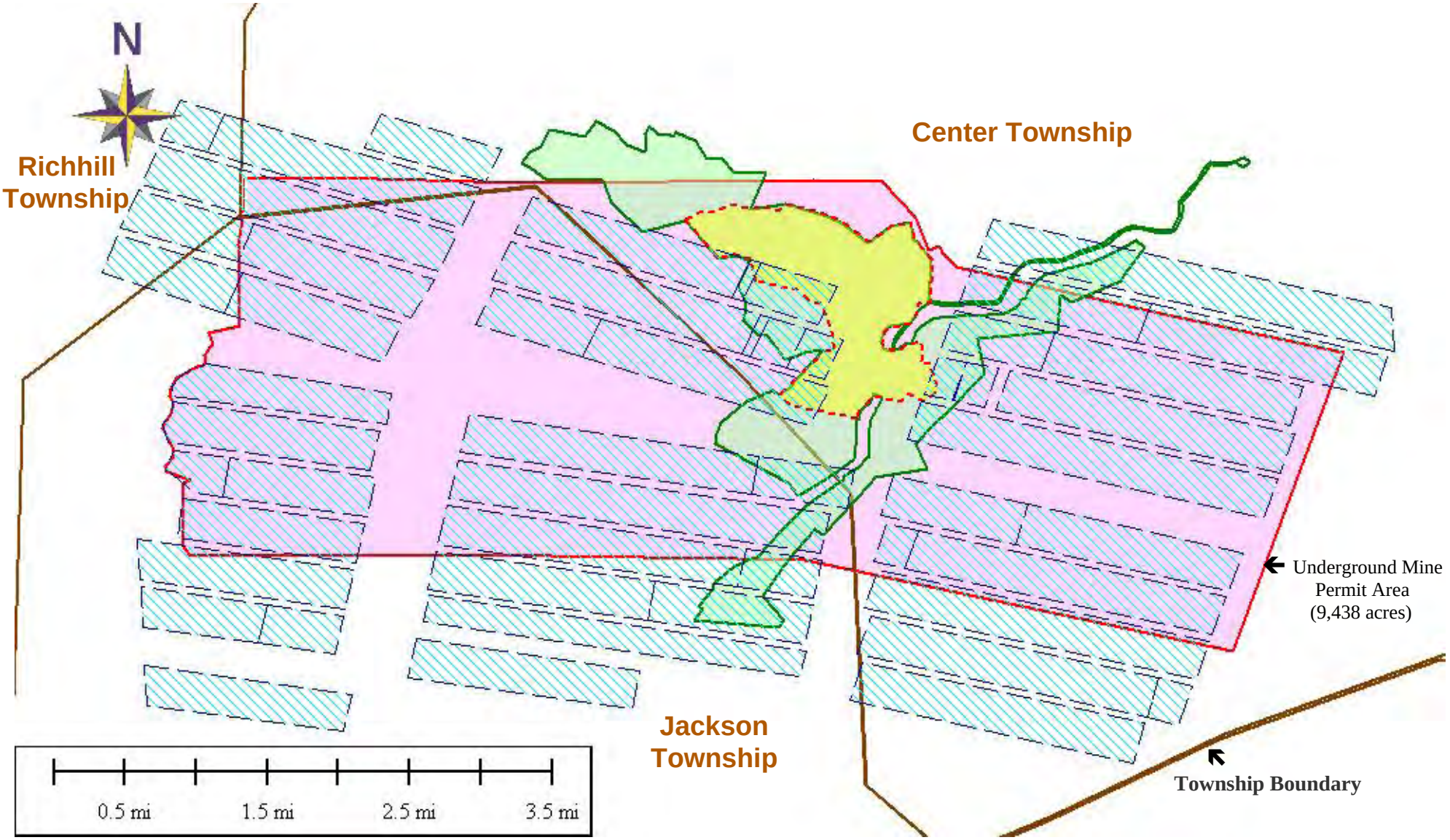


FIGURE 4. Proposed longwall panels of Foundation Mine (blue dash outline, blue hatch) some of which extend outside the proposed 20-year, 9,438-acre underground mine permit area (red outline with purple shading). Also shown are the surface facilities areas according to the 2010 State mine permit application (yellow) and according to the 2012 Corps 404 permit application (yellow plus green); the latter includes about 380 acres outside the mine "permit" area. Township boundaries are shown in brown. Figure is a compilation of various maps included in the Corps 404 application.

Recommendation: The exact full extent of any proposed underground mine, as well as the approximate extent and number of its potential future expansions, must be made clear.

B WATER RESOURCES AT RISK

B1 - Wetlands Undermapped in Surface Activity Areas

There were major discrepancies between the existing wetlands (and associated impacts) acknowledged (a) in the federal 404 application for Foundation Mine and those (b) in the State underground mine application. The discrepancies were due in part to the fact that the federal application addressed a much larger surface activities area than the State coal mine application. In part, however, the discrepancies also were due to the fact that there were dramatically more wetlands identified in the Corps application, even within only the 642-acre surface area outlined in the State application.

In conjunction with the federal Corps 404 permit application, the Pittsburgh District was requested by the applicant to review the applicant's identification of streams and wetlands within the proposed 1,867-acre surface facilities area[6]. Following numerous field inspections, the District issued a formal Jurisdictional Determination (JD) on 14 November 2012. The PADEP has no comparable process for formally reviewing the delineated extent of streams and wetlands, and so it typically relies upon and accepts the findings of a Corps JD if one is prepared. The Corps JD process is not mandatory for federal or state permitting, but is used by prudent applicants who seek to avoid the delays that can arise if previously unidentified water resources become an issue of concern during project review or implementation.

> The US Fish & Wildlife Service prepared National Wetlands Inventory (NWI) maps during the 1970s and 1980s for national and state-level wildlife management and planning purposes. The NWI mapping in southwestern Pennsylvania was compiled from photo-interpretation of high-altitude color infrared aerial photography taken during 1985 and is displayed on overlays to 7.5-minute USGS topographic quadrangles (scale, 1:24,000; 1" = 2,000'). NWI maps focus on large wetlands and typically omit small wetlands beneath deciduous forest canopy. In very few spots was NWI mapping field-verified. The NWI maps are only approximations of the actual extent of wetlands, and they never were intended to be accurate for site-specific regulatory purposes.

[6] The Corps JD examined only the surface activity areas identified in the 404 permit application. That area, which covers 1,867 acres, includes about 380 acres outside the [supposed] overall limits of the underground mine permit area and 1,487 acres inside it. Thus, wetlands and other Waters of the US at risk from longwall subsidence above about 7,950 acres of the proposed 9,438-acre underground mine have not been comprehensively examined and identified even in the Corps application.

The Corps JD for the surface activity areas of Foundation Mine included not only the 642-acre surface activity area which was the focus of the State underground mine application, but also a much larger area. It is of particular interest, however, to examine how accurately streams and wetlands were identified by the applicant just within the area that overlaps with that in the State application.

Number of Wetlands Within the 642-acre Surface Activity Area of the 2010 State Mine Application

2	according to NWI Maps
10	according to Foundation Mine delineations
27	according to Corps of Engineers

Within the 642-acre surface activity area that was the focus of the State application for Foundation Mine, the National Wetlands Inventory (NWI) had identified only two wetlands. Despite their limited accuracy, it was common practice for mine operators and PADEP to rely exclusively on the NWI maps for the identification of wetland resources in underground coal mine applications prior to the adoption by PADEP of Technical Guidance Document (TGD) 563-2000-655 in 2005 (Schmid and Company, Inc. 2000, 2010b).

For Foundation Mine, the applicant's consultants conducted field delineations and identified 10 wetlands[7] within the 642-acre surface area where the NWI maps showed only two. During the JD review process, however, the Corps identified 17 additional wetlands (for a total of 27 wetlands) within the same 642-acre area. So, while an applicant's field delineations may be more accurate than simple reliance on the NWI, the Corps JD review often identifies additional wetlands that may have been overlooked.

Within the full1,867-acre surface area that was the focus of the Corps 404 permit application for Foundation Mine, the NWI maps identified 4 wetlands and the State underground mine application identified 16 wetlands. The Corps JD process resulted in the identification of 28 more wetlands, for a total of 44 wetlands[8] totaling 2.659 acres. Of the 44 wetlands, 30 (totaling 2.207 acres) were determined to be jurisdictional for federal purposes. [Wetlands isolated from a surface tributary system currently are not considered jurisdictional for *federal* regulatory purposes; all wetlands, however, no matter their size or connection with other surface waters, are jurisdictional for *State* regulatory purposes.]

[7] In the final approved Corps JD, one additional wetland which had been identified in the State application as Wetland D (0.082 acre in the House Run watershed) was not listed, either as a jurisdictional or a non-jurisdictional wetland.

[8] One other wetland that had been identified in the 404 application was missing from the final approved Corps JD. Wetland F-31 (identified as an isolated, 0.017-acre PEM wetland) was not listed, either as a jurisdictional or a non-jurisdictional wetland. It is outside the smaller State surface activity area, but within the underground mine permit subsidence area, and never was identified in the State mine application.

The 28 additional wetlands identified by the Corps but not by the applicant within the 1,867-acre area represent more than half of the final total of 44 wetlands there (**Figure 5**). Such a discrepancy clearly illustrates the necessity and importance of having a Corps JD performed in conjunction with every coal mine application if all wetlands are to be identified.

> **Recommendation: When an application for a State underground coal mine permit is submitted, all delineated streams, wetlands, and other water bodies must have been reviewed and confirmed by a formal Corps JD.**

Within the 1,867-acre surface area examined by the Corps for the 2010 Foundation Mine JD, a total of 112,883 linear feet of streams was identified. Most (110,367 linear feet) of those streams were determined to be jurisdictional for federal purposes. PADEP TGD 563-2000-655 provides detailed directives regarding how to identify State-regulated (biologically variable and biologically diverse) streams. The extent of streams now being identified in accordance with that TGD is significantly more comprehensive than the streams shown as blue lines on USGS topographic quadrangles (which, if they flowed continuously year-round, is all that was depicted as regulated streams in mine applications in years past). The field and LiDAR-based mapping is also more inclusive than the National Hydrography Dataset (Simley, et al 2009).

Streams delineated at the Foundation Mine site in the State application following TGD 563-2000-655 generally corresponded well with streams identified as jurisdictional in the Corps JD for surface activity areas. This is expected to be the case in lands above the longwall mine panels (outside the surface activity areas) as well. Unfortunately, the CDMO typically waives regulation, including both acknowledgment of impacts and requirements for mitigation, for many stream impacts if they occur in headwaters or will be temporary (lasting “only” the 20+ years of the life of the mine) --- see also C2 below and comment D on Module 15 in Section 2.

B2 - Wetlands Undermapped Above Underground Areas

In its JD, the Corps reviewed and confirmed streams and wetlands only within the surface activities area that they were asked to review --- they did not review wetlands throughout the balance of the underground mine permit area where no fill was proposed to be placed. As noted above, streams above the entire underground mine area appear to have been adequately identified by the applicant in accordance with the more comprehensive requirements of the current TGD 563-2000-655. That is not the case, however, with wetlands.

TGD 563-2000-655 clearly states the PADEP policy intent “*to protect the functions and values of wetlands, as required by the Clean Streams Law, the BMSLCA, and Chapters 86, 89, 93, 96, and 105 of 25 PA Code*” when mining permits are reviewed. It is abundantly clear, especially based on the third Act 54 five-year review report (University of Pittsburgh 2011), that underground coal mines which use the longwall

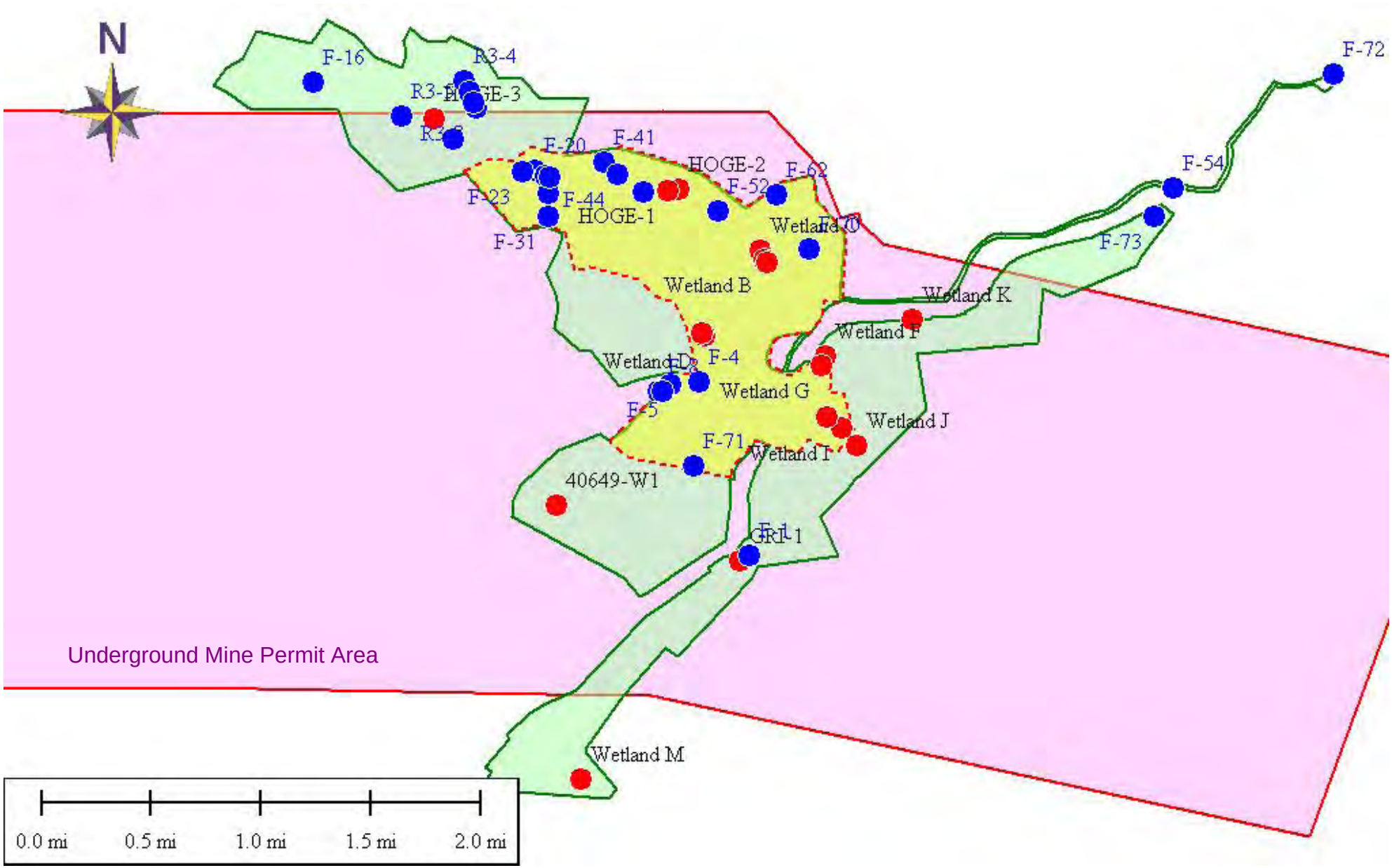


FIGURE 5. Location of wetlands identified by the applicant (red dots) and additional wetlands identified during the JD review by the Corps (blue dots) within the surface activities areas of either the 2010 State application (yellow) or the 2012 Corps application (yellow plus green) for the proposed Foundation Mine. Wetlands identified within almost 8,000 acres of the underground mine permit area (purple) outside the surface activities area have not been reviewed or confirmed by any agency and are not shown on this figure (see Figure 7).

method of planned subsidence adversely affect groundwater resources and surface water resources, including wetlands.

Wetlands that are not identified prior to undermining cannot be protected by permittees or by regulators.

Modules 8 and 15 of the Pennsylvania underground coal mine application are associated with the identification of wetlands and the assessment of wetland impacts, but they are not clearly or closely tied to the TGD or the regulatory requirements. Thus those requirements are not clear to the public or to applicants. This situation was well illustrated in the 2010 Foundation Mine application. The applicant's responses in Module 15 focused solely on wetlands affected by surface construction activities, not on wetlands potentially affected by the longwall mining itself, including planned or unplanned subsidence of the land surface above and near longwall panels.

TGD 563-2000-655 clearly specifies that wetlands be field delineated and documented above the entire underground mine[9], not only within the surface activity areas. One would expect to find roughly the same proportion of wetlands in the balance of the underground mine permit area for Foundation Mine as were identified in the 1,867-acre surface facilities area which was examined by the Corps during its JD review. Yet the proportion of wetlands as delineated by the applicant *outside* the surface facilities area (and not reviewed by any agency) was significantly smaller than those identified *within* that area following Corps review. If the proportions were the same[10], one would expect there to be about 187 additional wetlands in the balance of the underground mine permit area; instead, only 11 wetlands were identified by the applicant outside the surface activities areas. Even the highly generalized, non-regulatory NWI maps show *more* wetlands than the applicant acknowledged there --- a total of 13 --- which is still far fewer than would be expected proportionately to the area reviewed in the Corps JD. This suggests that not only was the number of wetlands significantly under-mapped in this Foundation Mine application, but the number of potential wetland impacts was underestimated as well.

Brief field inspections were conducted by Schmid & Company ecologists during June 2012 and April 2013 of selected areas above the proposed Foundation Mine outside the surface activities area. Numerous additional wetlands were observed that had not been delineated in any of the permit applications. One wetland of significant size (approximately 5 acres) was observed along the south side of Bristoria Road, within State Game Lands #179 (**Figures 6a** and **6b**). Numerous smaller wetlands were

[9] Per Section IV.2(d)(i) in TGD 563-2000-655: Among other required information is *"A complete inventory of wetlands in all areas where subsidence is likely to occur. (e.g., areas above panels and adjacent gate entries of longwall mining operations)."*

[10] The 44 (Corps-confirmed) wetlands within 1,867 acres = 0.0236 wetlands per acre. 0.0236 x 7,950 = 187.6 wetlands [Because 379 acres of the 1,867-acre surface area extend outside the mine permit area, the "balance" of the underground mine permit area was 7,950 acres rather than 7,571 acres.]

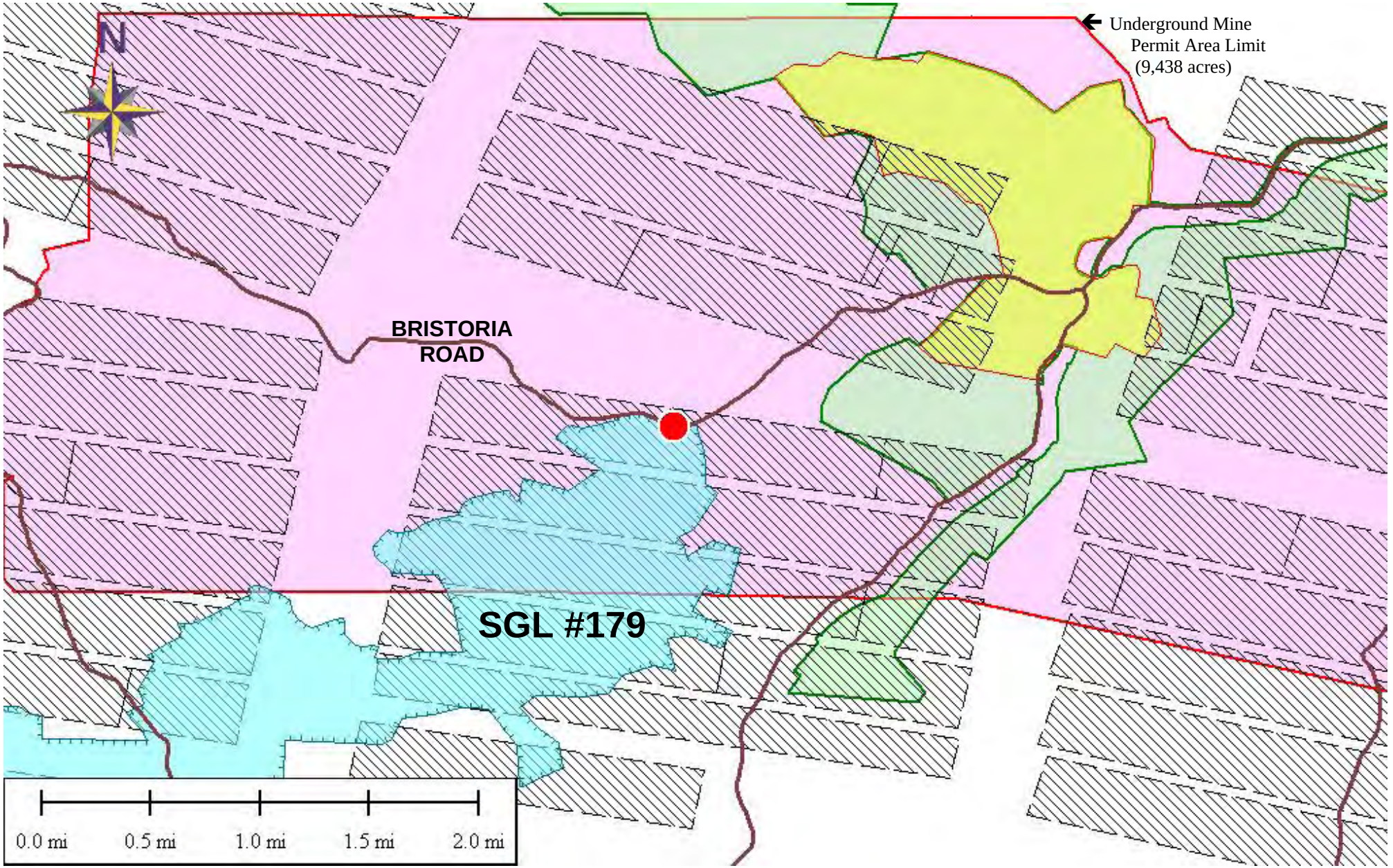


FIGURE 6a. Undelineated wetland (red dot) of about 5 acres in size along the south side of Bristoria Road within State Game Lands #179 (blue) within the Foundation Mine underground permit area (purple) but outside the surface facilities areas of either the 2010 State application (yellow) or the 2012 Corps application (yellow plus green). See Figure 6b for photos of this wetland. Many other undelineated wetlands were observed in these areas not yet reviewed by either agency (see Figure 7). Wetlands not identified in the application cannot be protected. Proposed longwall panels are hatched in black.

FIGURE 6b: Photos of a large wetland within State Game Lands # 179 along the south side of Bristoria Road, 9 April 2013. This wetland, at risk from longwall subsidence, is one of many which have not been identified in the underground mine permit application.

observed as well (**Figure 7**). Clearly, the CDMO was remiss in not seeking to confirm the accuracy of the wetland delineations outside of the surface activity areas as part of its review of the Foundation Mine permit application.

Recommendation: All wetlands above new or expanded longwall mines are at risk of subsidence damage, so a Corps JD must be secured for all areas above the underground mine and all immediately-adjacent areas.

B3 - "Created" Wetlands Lack Documentation and Protection

In recent years, as certain provisions of TGD 563-2000-655 have been more rigorously applied, some longwall mine operators have reported a net gain of wetlands post-mining. While that is good in theory, it can be erroneous if certain procedures are not properly followed. First, if all of the existing wetlands above the mine permit area were not accurately identified and delineated prior to mining, and confirmed by a Corps JD as discussed above in B1 and B2, then there is no assurance that one or more wetlands identified post-mining were not already there and had simply been overlooked.

Second, if as a result of longwall mine subsidence a wetland actually does develop in an area that previously was upland, it cannot be "counted" or credited as a gain unless some formal method of protection (such as a deed restriction) is established to ensure its long-term viability. This is especially important where the land in question is not owned or controlled by the mine operator. If a formerly well-drained property develops wetland conditions in a depression created by longwall subsidence, the landowner understandably may not be pleased and may seek to get the mine operator to eliminate it.

In the 2010 Foundation Mine application there was no discussion regarding how any newly created wetlands would be identified and protected.

Recommendation: No wetland "discovered" post-mining can be counted as a "gain" unless both (A) a Corps JD covering the area in question confirmed the lack of wetlands there prior to mining and (B) the extent of the new wetland is confirmed by a follow-up Corps JD and then protected from future destruction by a deed restriction, conservation easement, or comparable real estate instrument.

B4 - Water Resource Impacts Inadequately Addressed

In both the State mine application and the Corps 404 application, acknowledged “impacts” primarily were those specific sections of streams or wetlands where a direct disturbance (cut, fill, or regrading) was proposed. In many instances, additional segments of streams would be “orphaned” by the proposed direct disturbances,

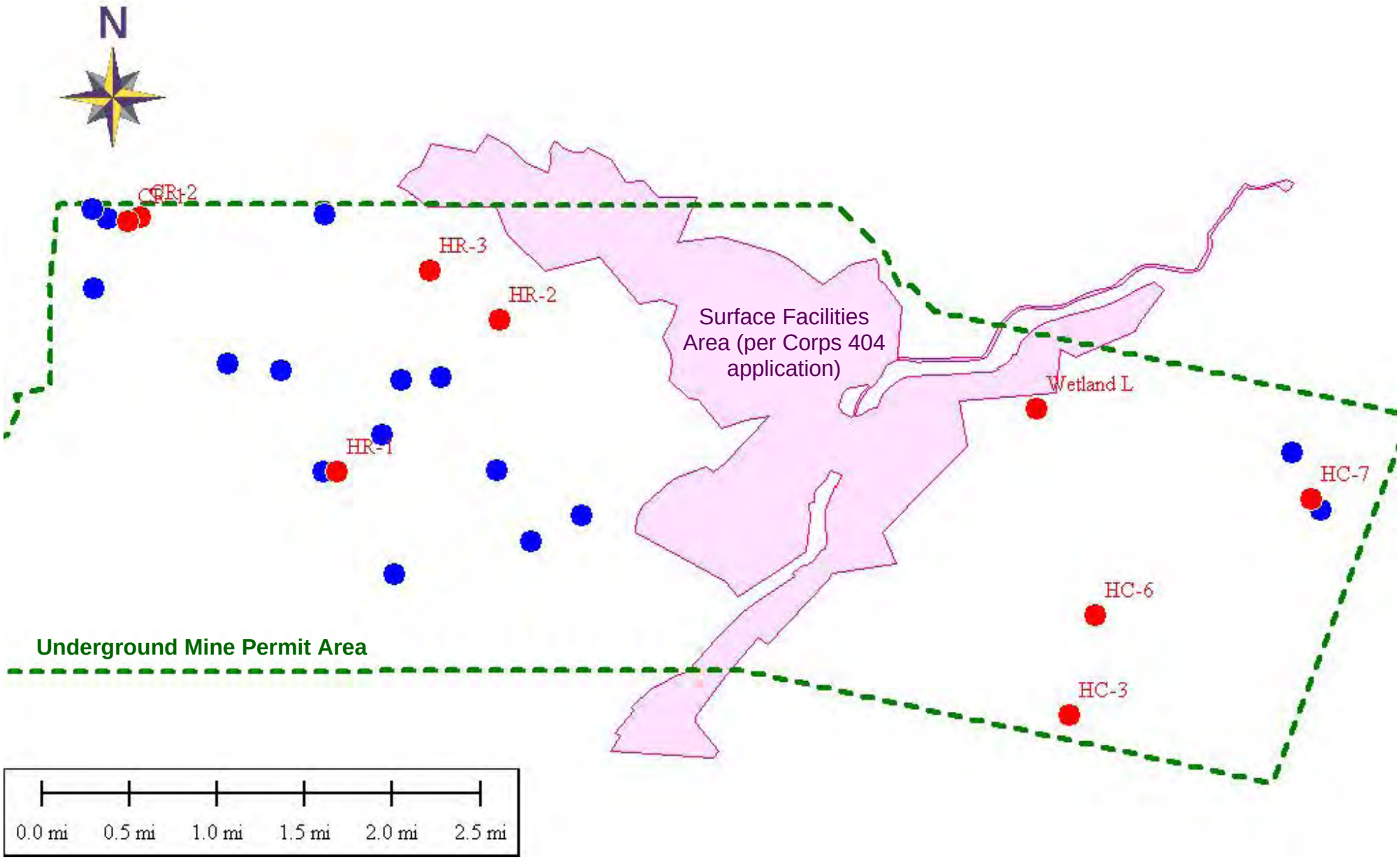


FIGURE 7. Location of wetlands within the proposed Foundation Mine underground permit area (green dash) but outside the surface activities areas reviewed by the Corps (purple shading). Fewer than a dozen wetlands were delineated by the applicant (**red dots**). Additional wetlands noted by Schmid and Company during brief field inspections are depicted by **blue dots**. The Schmid & Company inspections were not meant to be exhaustive, and there likely are many additional unidentified wetlands throughout this area (proportionately, one would expect there to be about 187 wetlands here - see text). None of these wetlands has yet been reviewed or confirmed by any agency.

leaving these segments dramatically altered either in the headwaters or near the mouths of tributary streams. These orphaned segments (**Figure 8**) cannot and would not continue to function as "streams" once the virtual entirety of their watersheds was converted to industrial uses. The same was true in certain wetlands, where large sections of the wetland were to be directly impacted and the remaining section, with no chance of continued functioning, nevertheless was not counted as impacted.

In some cases, even direct impacts were overlooked. For example, in the vicinity of the proposed Batch Weigh Loadout area, the rock outfall from a proposed sediment trap was shown on a drawing as extending into a corner of Wetland H (**Figure 9**). The footprint of that outfall, and any disturbance area around it necessary to install it, were not identified among the proposed wetland impacts anywhere in the State (or Corps) application.

Furthermore, in light of the significant amount of regrading proposed in the near vicinity of Wetland H, plus the proposed loss of the surrounding forest habitat, and the hydrologic disruptions proposed nearby (including the collection of sheet runoff and its redirection through manmade diversion ditches around proposed soil stockpiles), the hydrologic balance of all of Wetland H (as well as Wetland I just upstream from it) would be significantly impacted. Additionally, the Corps JD confirmed that Wetland H was 0.38 acre, or almost twice as large as was shown in the State coal mine application, so the actual direct and indirect impacts to it might be even larger than the 0.20 acre acknowledged in the 2010 application.

Recommendation: All proposed orphaned segments of streams and wetlands would need to be examined carefully, and in most if not all cases, be counted as impacts and appropriately mitigated in any new or expanded longwall mine application. All acknowledged impacts would need to be updated to reflect revisions to the size and location of wetlands and other waters made in the final Corps JD for the entire mine permit area.

B5 - National Pollutant Discharge Elimination System (NPDES) Permit Data Inadequate

The Foundation Mine application, as stated in the public notice published in the *Pennsylvania Bulletin* (see box below), included a request for NPDES permit approval. At the time this 2010 application was submitted, there was no separate PADEP form for the NPDES approval needed for underground mines. Since at least February 2011, Form 5600-PM-BMP0032[11] has been incorporated into Module 12. The older version of Module 12, and specifically Form 12.1A, was used in the 2010

[11] The current version of this form, entitled "Application for Individual NPDES Permit Associated with Mining Activities", is dated October 2012. Technical Guidance Document 563-2112-112 (adopted 22 June 2013) provides direction and procedures for establishing effluent limits for mine-related NPDES permits.

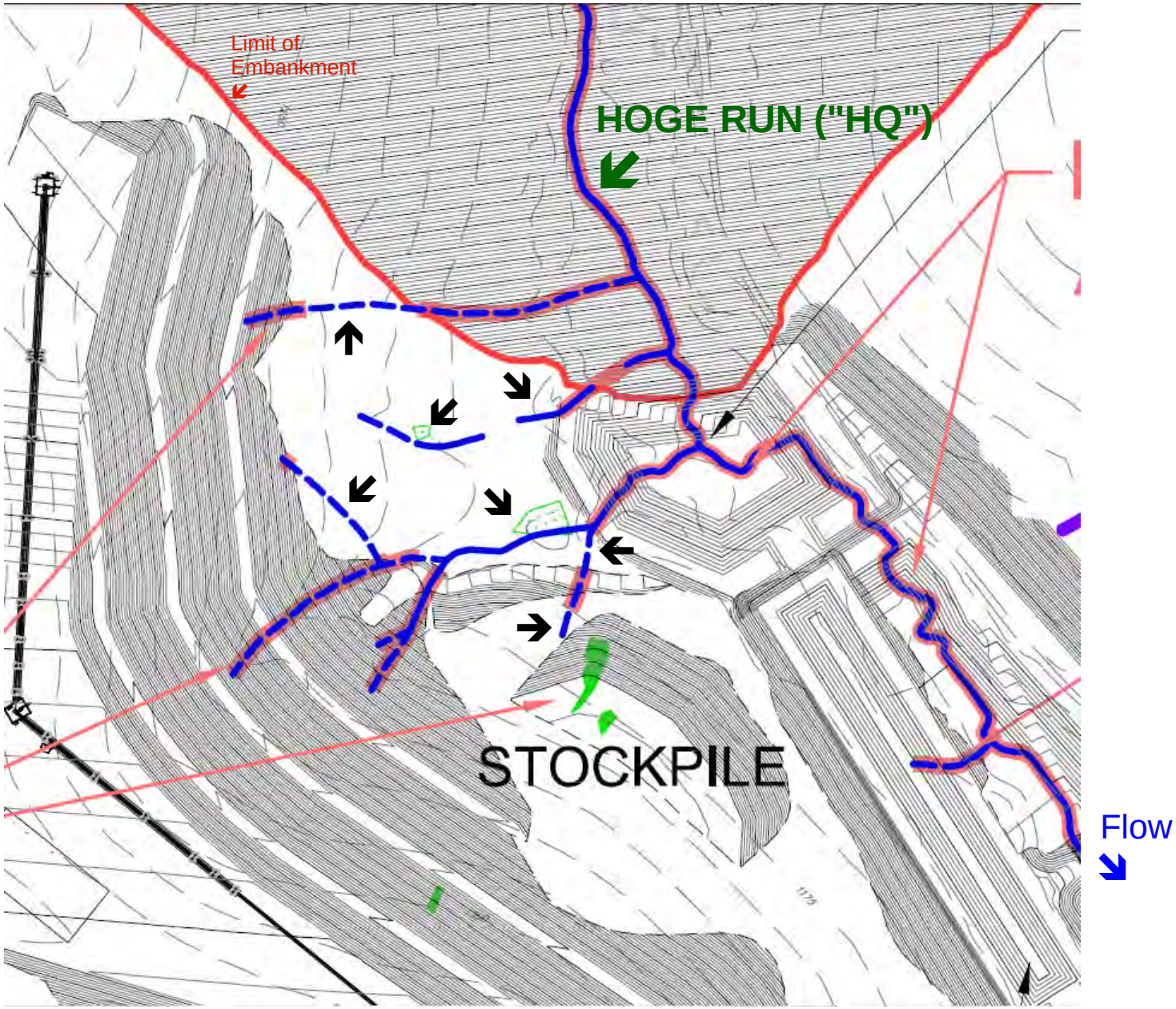
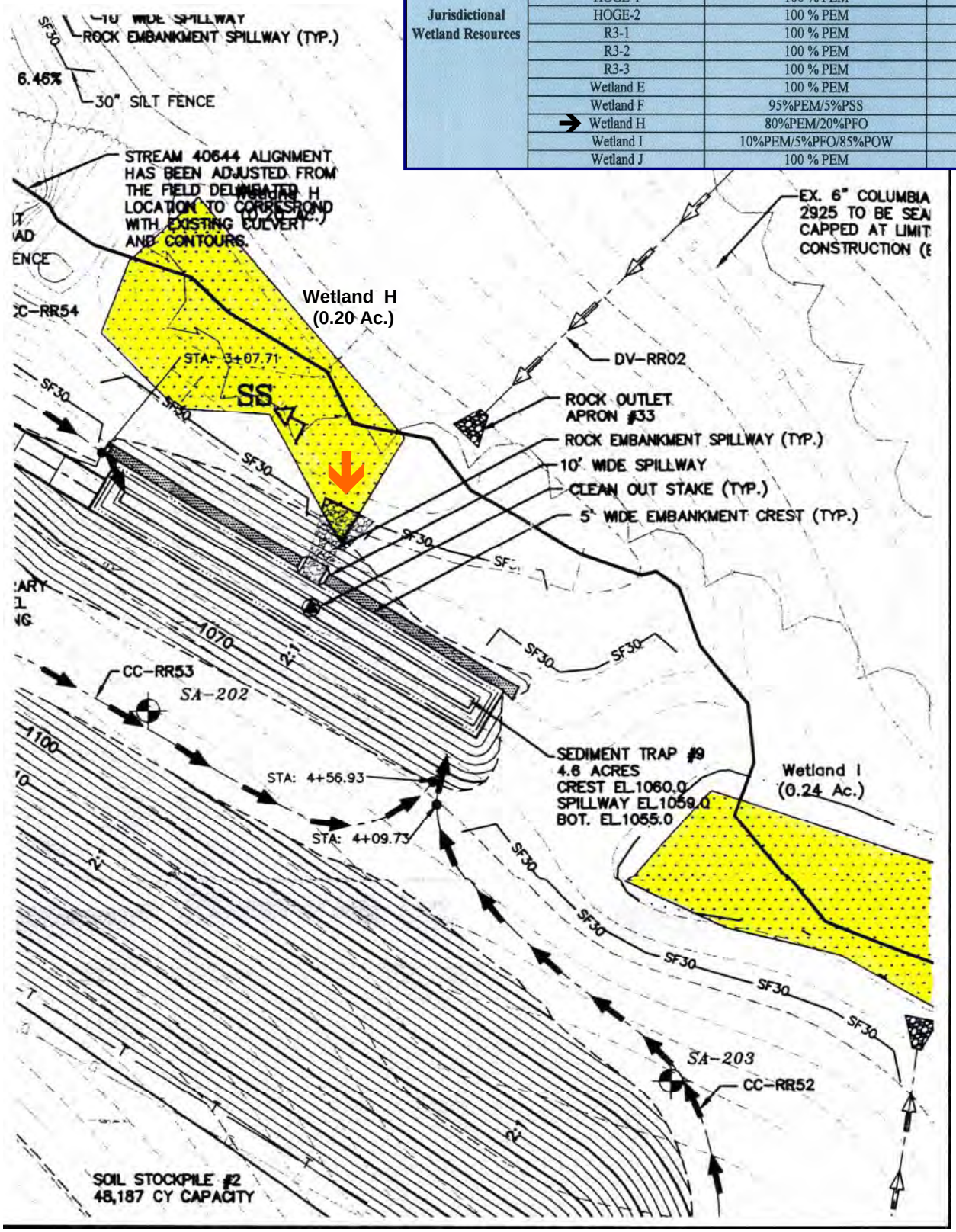


FIGURE 8. Excerpt from site plans for Foundation Mine showing proposed regrading along a section of Hoge Run. Blue streams outlined in red and solid green wetlands are applicant-acknowledged impacts (orange arrows). Orphaned or fragmented segments of other streams and wetlands (black arrows) which will not be directly filled or regraded were not counted by the applicant or the CDMO as "impacts", yet the significant disturbances proposed to the surrounding land use and natural runoff patterns near them will effectively destroy their existing functions and values.

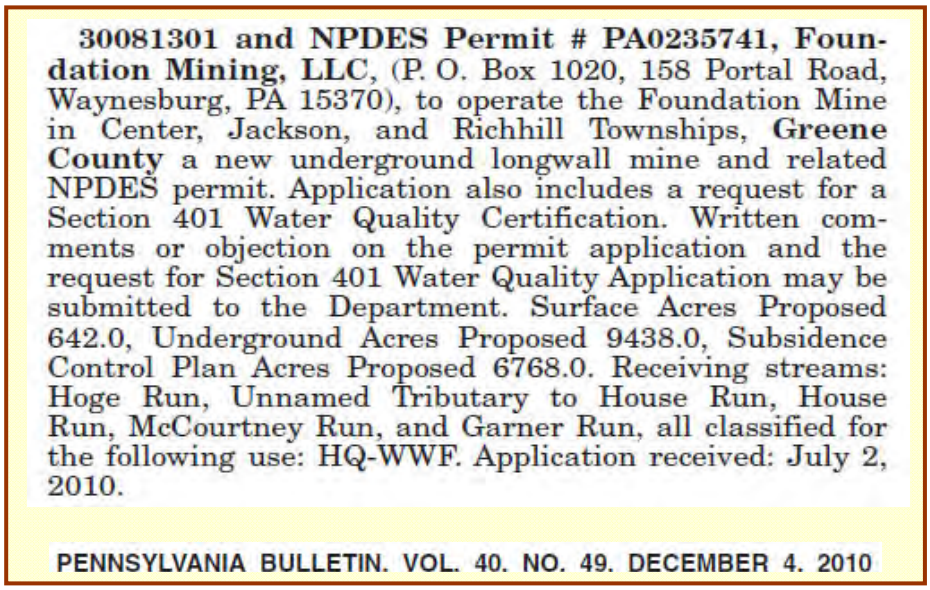


INSET
From Corps JD

Jurisdictional Wetland Resources		
F-5	100 % PEM	0.020
F-52	100 % PEM	0.040
F-54	100 % PEM	0.037
HOG-3	100 % PEM	0.168
HOGE-1	100 % PEM	0.128
HOGE-2	100 % PEM	0.256
R3-1	100 % PEM	0.020
R3-2	100 % PEM	0.022
R3-3	100 % PEM	0.006
Wetland E	100 % PEM	0.037
Wetland F	95%PEM/5%PSS	0.023
→ Wetland H	80%PEM/20%PFO	0.380 ←
Wetland I	10%PEM/5%PFO/85%POW	0.236
Wetland J	100 % PEM	0.043

FIGURE 9. Proposed construction in the vicinity of Wetlands H and I (yellow) along an unnamed tributary (#40644) to Garner Run, a perennial stream designated as High Quality. No impact to Wetland H is acknowledged in the application, despite the rock spillway proposed to encroach into it (red arrow), as well as the stormwater diversions proposed just outside of it. Basemap is from the 2010 State application Appendix A Detailed Site Plan, Design Drawing A19 of A59. Inset from the Corps JD identifies Wetland H as 0.38 acre, almost twice the size as in the State application drawing shown here.

Foundation Mine application to identify and describe proposed discharges to surface waters associated with the project, but that older version did not elicit the much more extensive relevant information that currently is requested. More information about Module 12 as used in the Foundation Mine application is provided in that section of Appendix A.



30081301 and NPDES Permit # PA0235741, Foundation Mining, LLC, (P. O. Box 1020, 158 Portal Road, Waynesburg, PA 15370), to operate the Foundation Mine in Center, Jackson, and Richhill Townships, **Greene County** a new underground longwall mine and related NPDES permit. Application also includes a request for a Section 401 Water Quality Certification. Written comments or objection on the permit application and the request for Section 401 Water Quality Application may be submitted to the Department. Surface Acres Proposed 642.0, Underground Acres Proposed 9438.0, Subsidence Control Plan Acres Proposed 6768.0. Receiving streams: Hoge Run, Unnamed Tributary to House Run, House Run, McCourtney Run, and Garner Run, all classified for the following use: HQ-WWF. Application received: July 2, 2010.

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Data that would be relevant for an NPDES approval, such as the characteristics of the proposed discharges and of the receiving waters, are compiled in Hydrology/ Baseline Biology (Module 8), in Erosion and Sediment Control (Module 11), and in Special Protection Waters (Module 24). Unfortunately, there is no mention at all of "NPDES" in any of those Modules, nor are there any cross-references to those Modules in Module 12. Currently, High Quality streams where point source discharges are proposed must undergo background sampling and analysis for a much longer list of parameters than ordinary waters, sampling is more rigorous, and best management practices must be used. Lacking the data necessary for modeling post-discharge water quality to these Special Protection waters, PADEP would not have been able lawfully to approve the NPDES permit for the Foundation Mine.

Recommendation: All of the information currently required by Form 5600-PM-BMP0032 must be included with any longwall mine application submitted to the CDMO. Otherwise, extensive modifications to proposed mine facilities may be necessary in order to comply with current requirements for mining in Special Protection watersheds.

C STREAM BUFFER VARIANCES

C1 - Stream Impacts Not Justified

The federal Surface Mining Control and Reclamation Act of 1977 (SMCRA) includes provisions to protect streams from the adverse impacts of coal mining operations. Typically referred to as the Stream Buffer Zone Rule[12], the federal requirement prohibits mining activities in or within 100 feet of any stream, if those activities will adversely affect the stream. Pennsylvania, like other states that have assumed primacy over the federal regulatory program for mining, has incorporated that requirement into its mining regulations. PA Chapter 86 (Surface and Underground Coal Mining) prohibits mining in or within 100 feet of streams except in those instances when a variance can be secured. The relevant section of the PADEP regulations reads as follows:

> **§ 86.102. Areas where mining is prohibited or limited.** Subject to valid existing rights, surface mining operations are not permitted: ..... (12) Within 100 feet measured horizontally of the bank of a perennial or intermittent stream. The Department may grant a variance from this distance requirement if the operator demonstrates beyond a reasonable doubt that there will be no adverse hydrologic impacts, water quality impacts or other environmental resources impacts as a result of the variance. The variance will be issued as a written order specifying the methods and techniques that shall be employed to prevent adverse impacts. [underlining added for emphasis]

This clearly worded variance requirement would appear to be straightforward and quite stringent. One might expect that such variances would be issued very rarely and only in limited, perhaps extraordinary, circumstances. Recent experience, however, indicates that stream variances are issued routinely by the CDMO --- even when minimal or no documentation or justification is provided.

For the Foundation Mine, disturbances to construct surface facilities were proposed in or within 100 feet of more than 4.6 miles (24,446 linear feet) of Special Protection streams according to the State application [more than 12 miles according to the Corps 404 permit application]. Because they would disturb land within 100 feet of these streams, those activities could only be authorized by a variance. According to the Module 2 Public Notice (revised August 2010) there were 32[13] separate variances needed inside the 642-acre surface activities area for State-acknowledged impacts within 100 feet of a stream [in fact, many more variances would be required for the additional surface activities identified in the Corps 404 permit application].

[12] Surface Mining Control and Reclamation Act (SMCRA), 30 U.S.C. 1202 §816.57 and §817.57.

[13] In Module 15 of the application, on Table 15.1.a., there are 31 stream variances listed totaling 24,370 feet. This discrepancy must be addressed by the applicant and the CDMO.

The variances that had been acknowledged in the State application for Foundation Mine ranged in size from 22 linear feet to 8,117 linear feet, averaging 764 linear feet. Two of the impact variances in the 2010 State application (for 282 feet and 284 feet) were for work in or near recognized EV (Exceptional Value) streams [Tier 3 Outstanding National Resource Waters in the terminology of the federal Clean Water Act]; the other 30 variances were for work that would have impacted streams designated as HQ (High Quality), which also warrant "special protection" per 25 *Pa. Code* 93.4a. More than three-quarters of the needed variances entailed impacts not just on riparian lands *within* 100 feet of, but directly to the streams themselves.

To elicit the documentation required in accordance with 25 *Pa. Code* §86.102, Module 15.1.b asks for the purpose and "justification" of proposed activities within 100 feet of any stream. In the 2010 CDMO application for Foundation Mine, the response included a description of each proposed major activity/facility (shaft site, slope site, coal preparation plant, and batch weigh facility). The descriptions, however, provided no "justification" or "demonstration" as to why a specific facility or activity must be located in or near any specific stream. The only actual "justification" provided was the self-serving, one-sentence statement that "*[t]hese installations are necessary to ensure the proposed Foundation Underground Mine's ability to operate*". No demonstration of a lack of hydrologic impact was given.

In addition to the Stream Buffer requirement, the PADEP Antidegradation Guidance (see box below) stipulates that activities within the buffers of Special Protection streams can only be allowed if they will result in a demonstrated environmental enhancement.

DOCUMENT NUMBER: 391-0300-002

TITLE: Water Quality Antidegradation Implementation Guidance

EFFECTIVE DATE: November 29, 2003

APPENDIX D

ANTIDEGRADATION BEST AVAILABLE COMBINATION OF TECHNOLOGIES FOR MINING ACTIVITIES

b. Stream buffers

Areas authorized for coal and industrial minerals surface mining activities are required to maintain a minimum 100-foot buffer along perennial and intermittent streams. In HQ or EV watersheds variances to the 100-foot buffer are only allowed if the mining activity will result in a demonstrated environmental enhancement or for minor construction activities like ditches or stream crossings. Such variances take the form of a Chapter 105 authorization or an order of DEP. Streams in HQ or EV watersheds may not be relocated to accommodate coal or noncoal surface mining activities unless the relocation results in environmental improvement. For example, environmental improvement can occur by relocating a stream to prevent it from flowing into abandoned mine areas or onto coal refuse. Relocation can occur only after issuance of a permit in accordance with the requirements of Chapter 105 and only if existing uses are maintained or protected.

In light of the Special Protection nature of the streams at issue here, and the fact that the proposed impacts in many cases involved their complete elimination for at least 20 years, if not indefinitely (see C2 below), a demonstration beyond a reasonable doubt that there would be no adverse hydrologic impacts, water quality impacts, or other environmental resource impacts as a result of the variance would be a most difficult task. This applicant did not even attempt any such demonstration.

Recommendation: Every stream buffer variance request for activities associated with a new or expanded longwall mine must be specifically and fully justified by the applicant, and must demonstrate the required enhancement. Every individual variance issued by the CDMO must repeat the justification (specifying the methods and techniques that will be employed to prevent adverse impacts) and acknowledge the CDMO's concurrence with it.

C2 - Stream Impacts Not Fully Mitigated

The Stream Buffer requirement ostensibly is meant to protect streams from damage due to mining activities. In the Foundation Mine application, however, stream protection was not being provided. Not only was the justification for each stream buffer variance not demonstrated (as discussed above in C1), but the actual direct impacts to streams for the proposed construction of surface facilities for the most part were not being mitigated or offset by any proposed environmental enhancement.

The Foundation Mine applicant candidly noted in Section 15.2.c. that "*The majority of streams proposed for impact will be filled, eliminating their contribution to watershed hydrology and potential as aquatic habitat*". Yet those impacts, all of which involved Special Protection waters, were being viewed by the CDMO as only "temporary" (and thus not needing mitigation) because the fill was proposed to be excavated and the streams returned to their approximate original condition after the entire mining operation was proposed to end some 20 or more years later (see also comment D for Module 15 in Appendix A). It is unclear how the CDMO might have rationalized issuing a Clean Water Act Section 401 water quality certification for the losses of many miles of Special Protection waters for 20 years or more or believed that those streams would have been improved or enhanced on the basis of this application.

Furthermore, the post-mine "restoration" of streams that would be filled "temporarily" for surface activities proposed merely the re-establishment of the approximate stream channels that existed prior to their disturbance. There was no plan to ensure that the future quality of the waterways or their biological functions would be returned to their present Special Protection uses. A recent scientific study suggests that physical manipulation alone is unlikely to result in biological restoration of damaged streams (Doyle and Shields 2012).

Even if the 2010 Foundation Mine application had proposed to fully restore the existing ecological functions of the streams that were to be impacted, the baseline stream assessments upon which restoration would need to be based were of doubtful accuracy. Furthermore, the funding set aside for stream restoration and monitoring in the required performance bond for Foundation Mine was woefully inadequate to successfully reclaim these High Quality watersheds or to allow the Department to do so in the very real likelihood that the mine operator declared bankruptcy or otherwise would be unable to meet its obligations.

Recommendation: For any new or expanded longwall mine application, a mitigation plan must be developed, bonded, and approved by PADEP for every stream that would be directly impacted by the construction and operation of surface facilities. A condition must be included in any permit that the stream mitigation be implemented in a timely manner, and be monitored to ensure successful replacement of the functions and values lost. The estimated costs of any such restoration and monitoring must be included in required performance bonds.

Recent scientific investigations demonstrate that the headwaters of a stream are crucial to the water quality, nutrient cycling, biodiversity, and ecological functioning of downstream sections of that stream (Alexander *et al*. 2007; Meyer *et al*. 2007; Kaplan *et al*. 2008; Meyer *et al*. 2003; Pond *et al*. 2008; Stout 2004; and Clark *et al*. 2008). Where surface facilities for Foundation Mine were proposed to be constructed in the headwaters of a stream (*i.e*., where the stream had a drainage area of 100 acres or less), no restoration was proposed. That such impacts would not be mitigated was not stated as clearly in the State underground coal mine application as it was in the Corps 404 application, where it was noted that:

> PADEP- CDMO indicated that mitigation ... was also waived for surface facility impacts to those waterways that possessed less than 100 acres drainage area.

The so-called "100-acre waiver" is commonly applied statewide to 25 *Pa. Code* Chapter 105 activities[14], but it can be disallowed wherever the Department finds that the structure or activity "*has a significant effect upon safety or the protection of life, health, property, or the environment*". This waiver should not be allowed for activities in Special Protection waters as in this instance. Elimination of any part of an Exceptional Value waterway is directly contrary to the State's antidegradation requirements at §93.4c and is not allowable at all. To allow elimination of any part of a High Quality waterway without explicit, site-specific social or economic justification and without mitigation is contrary to the requirements at §93.4c. Furthermore, after 20+ years of having been filled, if the approximate pre-mining stream channel is re-established only in those sections of a stream below the current 100-acre drainage

[14] Specifically §105.12(a)(2). Chapter 105 embodies the regulations adopted pursuant to the Pennsylvania Dam Safety and Encroachments Act (Act of Nov. 26, 1978, P.L. 1375, No. 325)

point, that future stream will not function as before. It would be like cutting off each finger on one's hand at the first knuckle and suggesting that hand is as good as ever.

Recommendation: In any longwall mine application, every stream segment delineated as either "biologically diverse" or "biologically variable" per TGD 563-2000-655 that would be directly affected by surface facility construction or operation must be identified as an impact, and the impact must be included in the stream buffer variance request, must be fully justified, and must be mitigated and monitored sufficiently to demonstrate overall environmental enhancement.

Streams that will be pooled or dewatered by longwall mining subsidence were not included in any of the stream buffer variance requests in the Foundation Mine application. At least 21 separate incidents of pooling were predicted in streams above the underground operation of the Foundation Mine. However, according to TGD 563-2000-655, only those stream pooling incidents that are predicted to be more than 1 foot deep require any restoration. Thus, 17 of the 21 incidents of predicted stream pooling were not proposed to be mitigated, even though the pooling would occur in a free-flowing Special Protection waterway.

Many segments of streams would be expected to lose flow when undermined by the longwall methods proposed for Foundation Mine[15] --- exactly how many is not known because there is no model available to predict potential flow losses similar to the model currently used to predict pooling. Some of the flow losses could be temporary (up to several months), but the flow in some streams might never recover even after years of attempted restoration. Because these incidents of flow loss were not predicted in the application, none was included in the variance requests. None, too, was included in any posted performance bond, so there would be no funds for restoration.

During December 2012, CDMO determined that least 6 streams located only a few miles west of the proposed Foundation Mine had experienced permanent loss of flow due to longwall mining activities (see Appendix B).

Recommendation: Every Special Protection stream that potentially would be affected by stream pooling of any depth or by flow loss must be identified and included in the stream buffer variance request for any longwall mine application, and the impacts must be fully justified and mitigated.

As noted above in B3, Foundation Mine impacts to streams which needed CDMO approval via variances were understated in another way. Some segments of streams

[15] During the third 5-Year Act 54 Review Report (University of Pittsburgh 2011), there were 53 documented instances of stream damages due to prolonged flow loss, all of them as a result of longwall mining.

would have been "orphaned" or fragmented by direct disturbances to other sections of the stream. Those orphaned segments could not and would not continue to function as "streams" once most of their watersheds were converted from forest to industrial mining uses and their natural hydrologic patterns were severely disrupted.

Recommendation: In any longwall mine application, every stream segment proposed to be orphaned by elimination of adjacent sections must be counted as an impact requiring a stream buffer variance, and must be fully justified. Every stream buffer variance granted must include an enforceable condition that the stream's pre-mining uses and quality will be replaced or restored according to the standards described in TGD 563-2000-655 at IV.1(a)(viii), and Appendix D of TGD 391-0300-002. The costs of restoration and monitoring to ensure success must be included in performance bonds.

D IMPACTS TO GROUNDWATER AND TO WATER SUPPLIES (WELLS)

D1 - Technical Guidance For Groundwater Protection Ignored

More than three million residents of Pennsylvania rely on groundwater (via an individual private well, spring, or cistern) for their home water supply (Penn State University 2009), including many rural residents of southwestern Pennsylvania. Underground coal mining in general, and current mining by the longwall method in particular, have been documented to cause impacts to groundwater, and in turn, to residents' water supplies. Undermining can impact groundwater either by a change in water quality, by a change in water quantity, or both. As with any potential impact, mining-induced groundwater impacts can only be determined if adequate pre-mining, during-mining, and post-mining information is collected and evaluated by reliable methods.

The PADEP regulations at 25 *Pa. Code* Chapter 89 (relating to underground coal mining and preparation plant facilities) include provisions for the monitoring and protection of groundwater resources. In particular:

> **§ 89.34. Hydrology.** (a) The operation plan shall contain pre-mining or baseline hydrologic information representative of the proposed permit, adjacent and general areas. (1) Groundwater information shall include: (i) The results of a groundwater inventory of existing wells, springs and other groundwater resources, providing information on location, ownership, quality, quantity, depth to water and usage for the proposed permit area and adjacent area. Information on water availability, occurrence and alternative water supplies shall be emphasized.

§ 89.36. Protection of the hydrologic balance.
(a) The operation plan shall describe, with appropriate maps and cross sections, the measures to be taken to ensure the protection of the hydrologic balance and to prevent adverse hydrologic consequences. The measures shall address: (1) The quality and quantity of surface and groundwater within the proposed permit and adjacent areas. (2) The rights of present users to surface and groundwater. ....
(b) The operation plan shall also describe how the proposed mine development plan will prevent or minimize adverse hydrologic consequences.
(c) The operation plan shall include a description of the measures which will be taken to replace water supplies which are contaminated, diminished or interrupted by underground mining activities.

§ 89.59. Surface water and groundwater monitoring. (a) Surface water and groundwater monitoring shall be conducted under § 89.34 (relating to hydrology) and with the monitoring plan contained in the permit.
[underlining added for emphasis]

If a well is affected by mining, the mine operator is required to replace the pre-mining quantity and quality of water. To assist mine applicants in determining well yields, PADEP developed a technical guidance document entitled "Water Supply Replacement and Permitting" (TGD 563-2112-605; dated 31 December 1998, last revised 13 July 1999). This TGD is referenced in Module 8 of the underground coal mine application[16].

According to TGD 563-2112-605, water supply wells that "may experience" a loss, diminution, or interruption due to mining:

- must be included in the Hydrology inventory [Module 8]
- must have their quality and quantity sampled and surveyed (with 6-month mining plan or before mining comes within 1,000 feet).

There are several problems with TGD 563-2112-605 that greatly limit its effectiveness in achieving compliance with the Chapter 89 regulations highlighted above. First, this TGD states that it applies to water supplies that may be adversely impacted by surface coal mining activities, with no mention of underground mining activities or their resulting surface impacts. Thus, some underground mine applicants are likely to ignore the guidance altogether, inasmuch as the TGD itself specifically states that it applies to surface mining activities[17].

[16] It is referenced in Section 8.7 in the 2001 version of Module 8 that was used for the 2010 Foundation Mine application. In the 2008 revision that should have been used, and in the current 2012 revision of Module 8, this TGD is referenced in Section 8.16.

[17] There is no mention in Module 8 of TGD 562-4000-101 ("Water Supply Replacement and Compliance", dated 18 October 1999) which does apply to underground coal mines and might be a more appropriate reference for determining the sustainable yield of existing water wells.

Even for underground mine applicants who choose to abide by the requirements of TGD 563-2112-605, there are two additional problems:

(1) The pre-mining sampling does not need to be included or reviewed as part of a permit *application*, but only after the permit has been issued and actual undermining approaches a well. Because there is no clear empirical evidence relating distance to mining and water supply damage, especially as recent advances in longwall mining technology have allowed panels to become significantly wider and longer, it may not be appropriate to wait until mining is within 1,000 feet of a well before collecting "pre-mining" data. By that time, the groundwater hydrology may already have been affected.

(2) The mine applicant is supposed to survey existing water supply information only to the extent it "*can be collected without extraordinary efforts or the expenditure of excessive sums of money*". These undefined qualifiers could be exploited as loopholes in the requirement and provide an applicant an excuse for not collecting the pre-mining water supply information.

One final concern with TGD 563-2112-605 is that, if the quantity of water available in the existing supply "*is substantially greater than the owners would require for any reasonably foreseeable use*", then it allows the District Mining Office to consider a demonstration from the mine applicant that a proposed (lesser) alternate water supply will be sufficient to meet all reasonably foreseeable needs of the current water supply owners. It is not clear how coal mine operators can accurately foresee the water needs of future generations of surface landowners, and the existing well owner apparently is afforded no input into the matter. This is another loophole that greatly weakens the protections ostensibly included in Act 54 and the current Chapter 89 regulations.

Recommendation: PADEP TGD 563-2112-605 must be revised to explicitly apply to underground mining operations. Alternatively, TGD 562-4000-101 (PADEP 1999a) must be referenced in Module 8. Also, the CDMO must require the pre-mining survey of water supplies to be performed during the permit application process, all water supplies in the mine permit area must be surveyed, and replacement supplies must provide a quantity and quality of water equal to or greater than the existing supply. Only then could Act 54's rhetorical protections have any chance of actual implementation.

D2 - Well Yields Not Inventoried Or Assessed

Module 8 of the underground mine application is meant to provide pre-mining baseline information about the hydrology of the mine permit area. It addresses both surface water and groundwater resources. With respect to groundwater, several forms are provided to applicants on which to document the quality and quantity of the water of wells in the permit area. Section 8.4 (Background Sampling and

Measurements) notes that information, including "pumping tests", is to be provided on Forms 8.13A and 8.13B[18].

Well water quality is documented primarily using Form 8.13A (Background/ Monitoring Report). This form is used by applicants to collect basic information about the well water including: temperature, iron, suspended solids, manganese, aluminum, sulfates, specific conductance, alkalinity, acidity, field pH, and lab pH[19]. The static water elevation on the date the well is sampled also is to be recorded on the Form.

Well water quantity is to be documented using Form 8.13B (Specific Capacity Data, see box below). The yield of a well can be estimated by determining the well's "specific capacity." The specific capacity of a well is the pumping rate in gallons per minute (gpm) during a pumping test, divided by the drawdown (in feet) at equilibrium (Penn State University 2009). In other words, the specific capacity is the flow rate per foot of drawdown (gpm/ft). Form 8.13B is used to report such information as the pumping rate, the water level before and after pumping, the gallons of water pumped, the length of the pumping test, and the specific capacity. Results are to be interpreted in light of the season and hydrological conditions.

For the Foundation Mine application, Form 8.4A was completed for several hundred surface and groundwater monitoring points, including at least 86 wells. Water *quality* parameters for well water were recorded, but in many cases no flow or static water level information was provided. In most cases, only two sample dates were recorded.

FORM 8.13B: SPECIFIC CAPACITY DATA

Operator: _____

Operation Name: _____

Permit#: _____

(msl) = mean sea level.

Name:	Well, Sample ID or Structure #:	Date:
Top of casing elevation (msl):	Length of pump test: (hr.) (min.)	
Land surface elevation (msl):	Water level (end of test):	
Static water level (before test):	Total gallons pumped:	
Well bottom elevation (msl):	Total gallons released from borehole storage:	
Pump setting elevation (msl):	Specific Capacity (gpm/ft):	
Pumping rate (gpm):	Percentage of water from borehole storage:	
Comments on test and data:		

Blank Form 8.13B, which is to be used to collect data on well water quantity.

[18] The 2010 Foundation Mine application used the obsolete version of Module 8, in which these forms were numbered Forms 8.4A and 8.4B, respectively. Except for the Form number, however, the data requested are essentially the same.

[19] We strongly recommend that methane (CH_4) also be added to this Form and measured routinely.

No pumping tests or specific capacity (yield) data (Form 8.13B) were provided in the 2010 Foundation Mine application for any well. In Module Section 8.7, the applicant stated "*Well yield data will be gathered and provided prior to the mining encroaching within 1,000 feet of the supply*." That would minimally comply with the "letter" of the application requirements in Section 8.7, but it is unclear why the applicant would choose to make a separate visit to each well site when its representative already was there (in some cases on more than one occasion) to record well water quality information. More importantly, the CDMO should require tests of well water quantity, and not just quality, to be made and reported during the permit application process, and not allow applicants to wait until mining has been approved and is approaching to within 1,000 feet of a well, by which time the groundwater may already be experiencing adverse effects from the longer and wider panels of modern longwall mines (see D1 above).

After a permit is issued, the CDMO typically provides a Hydrologic Monitoring Report (HMR) form to the permittee on which to report continued monitoring of groundwater levels and quality. HMRs collect the same minimal information about a well as application Form 8.13A. According to the instructions provided by the CDMO, the HMR form is used in reporting the sample and measurement results of a hydrologic monitoring program, and sampling is to be done once per quarter.

The quarterly HMR form, however, does not require any of the same well water quantity or yield information as is supposed to be collected in Form 8.13B. No other form is available to provide the post-mining results of well pumping (specific capacity); presumably, the application Form 8.13B is to be used for both pre-mining and post-mining purposes. In our experience reviewing CDMO files, no post-mining pumping tests or well yield analyses are being reported by operating longwall mines. As a result, impacts to residents' water supplies are not being fully identified, evaluated, or restored in accordance with the requirements of Chapter 89 (see D1, above) or Act 54.

In Module 22 (Subsidence Control), Section 22.1.h, the applicant is asked to "*describe the measures to be taken to minimize damage, destruction or disruption of services to*", among other things, "water wells". The response to this in the Foundation Mine application was that the relevant sections of Act 54 (Sections 5.1, 5.2, and 5.3) would be complied with. Section 5.1 of Act 54 states that the mine operator must restore or replace any affected water supply with an alternate supply that serves "in quantity and quality the pre-mining uses" or any reasonably foreseeable uses. Clearly, the necessary post-mining quantity of an affected water supply cannot be judged adequate unless its pre-mining quantity has been determined. The TGD 563-2112-605 (discussed more fully in D1 above) weakens this requirement because it "*assumes that a replacement yield of 5 gallons per minute (gpm) is generally adequate for domestic water supplies*" [p. 10], even where the actual pre-mining yield may have been greater. Also, an affected property owner would have the burden to justify specifically needing any larger yield.

Recommendation: The CDMO must require mine applicants to collect well yield data for all wells proposed to be undermined and to report the results as part of the permit application process (and not after the permit has been approved and mining already is underway). There also must be a specific directive as part of the application, repeated in a specific condition as a part of the permit when issued, that post-mining well yield, along with water quality, data be collected by the mine operator (and reported to both the CDMO and the landowner) for all wells that were tested pre-mining, and if the yield of any well has been diminished, that it be fully restored to its pre-mining condition.

E IMPACTS TO THE HYDROLOGIC BALANCE

E1 - Existing Information on Hydrologic Balance Lacking

The excerpt below from 25 *Pa. Code* Chapter 86 highlights some of the requirements for mine permit issuance regarding protection of the hydrologic balance.

> **§ 86.37. Criteria for permit approval or denial.** (a) A permit will not be approved unless the application affirmatively demonstrates and the Department finds, in writing, on the basis of the information in the application or from information otherwise available, which is documented in the approval, and made available to the applicant, that the following apply:
>
> (1) The permit application is accurate and complete and that the requirements of the acts and this chapter have been complied with. ...
>
> (3) The applicant has demonstrated that there is no presumptive evidence of potential pollution of the waters of this Commonwealth.
>
> (4) The assessment of the probable cumulative impacts of all anticipated coal mining in the general area on the hydrologic balance as described in § 87.69, § 88.49, § 89.36 or § 90.35 has been made by the Department, and the activities proposed under the application have been designed to prevent material damage to the hydrologic balance outside the proposed permit area.
>
> [underlining added for emphasis]

Neither the existing hydrologic balance of the Foundation Mine permit area, nor that of the larger watersheds of which it is a part, was adequately identified in the 2010 mine application. As noted above in D, crucial information about the quantity of groundwater and specific capacity/yields of individual wells was not collected. Surface waters at risk, particularly wetlands, were not fully or accurately identified. There was no data upon which the CDMO could make the necessary assessment in § 86.37(a)(4).

The Pennsylvania Environmental Hearing Board[20] has found that hydrologic changes such as pooling and flow loss fit within the definition of "pollution" under the Clean Streams Law[21]. That finding is applicable even if the hydrologic changes are "planned and controlled", as land subsidence above longwall mines often is promoted as being. Efforts to minimize disturbances to the prevailing hydrologic balance in the permit area and adjacent areas, and to prevent material damage to the hydrologic balance outside the permit area (in accordance with current regulatory requirements), cannot be credibly evaluated unless and until the various elements of the hydrologic system first have been adequately identified and described. No CHIA (Cumulative Hydrologic Impact Assessment) was prepared by the CDMO for the proposed Foundation Mine.

The 2010 Foundation Mine application was deficient in predicting the probable hydrologic consequences of the proposed underground mining activities per 25 *Pa. Code* Chapter 89, as discussed in D above. Inadequate baseline information was collected. Even if the yields of individual water wells were to be documented as having been diminished as a result of the operation of this mine, that would merely be an indication (a warning -- like the collapse of a caged canary in coal mines historically) of a much larger problem, namely, that an impact to the groundwater system has occurred. Absent accurate and comprehensive pre-mining inventory, it is not possible to predict the likely hydrologic consequences, or to protect the hydrologic balance, or subsequently to measure and assess whether material damage to the hydrologic balance has occurred, or later to determine whether the hydrologic balance has been restored to its previous condition.

Each of the three Act 54 Review Reports prepared to date has documented hundreds of well water supply impacts from underground mines during each 5-year period, and the damages associated with longwall mines are consistently higher than for the more numerous room-and-pillar mines. The lack of pre-mining information on the quantity of water in supplies at risk from the proposed Foundation Mine contributes to the ongoing failure by PADEP and coal mine applicants to understand and protect the hydrologic balance of the watersheds in southwestern Pennsylvania.

E2 - Models to Predict Hydrologic Impacts Inadequate

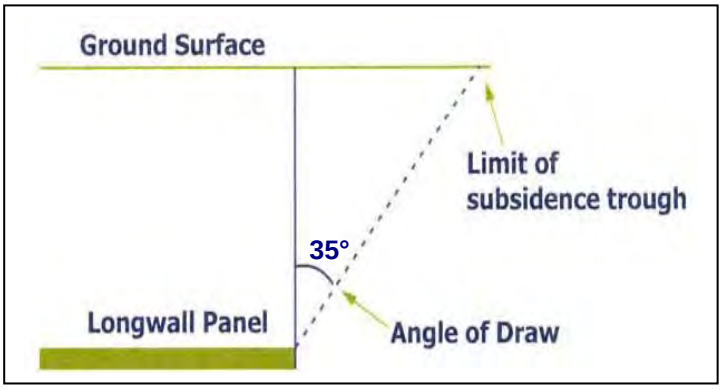
There currently are several ways that predictions of hydrologic impacts from longwall mine operations are made, none of which is wholly reliable. One is the 35^{o} "angle of draw" within which post-mining impacts on water supplies are presumed to be

[20] *Oley Township v. DEP*, 1996 EHB 1098.
[21] 35 P.S. §691.1.

attributable to underground mining[22]. Another involves predicting the location and extent of stream pooling. Both of these are based on information and assumptions that now are several decades old and which may no longer be relevant to modern longwall panels that are 2 or 3 times wider than they were when the models were developed. Furthermore, such models apply only to a small subset of obvious impacts on the hydrologic balance.

Predicting Water Supply Impacts

Act 54 established a zone of presumptive liability for underground mine operations that is equal to the footprint of the mine operation plus an additional adjacent area bounded by the intersection of the surface and a line drawn from the base of the mined coal seam at an angle of 35 degrees from vertical. Within this zone, mine operators are presumed to be responsible for post-mining water supply damage, unless they can convincingly demonstrate that the water loss was due to another cause. The basis of the 35° angle zone is not clear. A 35° angle zone presumption was suggested in the 1990 "consensus" document produced by the Deep Mine Mediation Project (Beauduy 1990), and it was carried through into the final version of Act 54 adopted in 1994. According to C.J. Booth[23], a number of studies were available at that time suggesting angles of influence ranging from 16° to 60°:



> .... various studies in the Appalachian coalfield show apparent angles of groundwater influence that vary widely: e.g., 16–24° in the upper overburden zone and 32° in the lower zone (Cifelli and Rauch 1986); 38–60° to the limits of influence at 177–387 m [581-1,270 ft] (Moebs and Barton 1985); and distances to the initial potentiometric response of 120–180 m [394-591 ft] (approximately the thickness of the overburden, an angle of about 45°; (Walker 1988). Tieman and Rauch (1987) found that dewatering of wells separated by at least 150 m [492 ft] above the mine at a site in Pennsylvania extended a distance of about 300 m [984 ft] at an ''angle of dewatering influence'' of about 42°.

[22] With respect to structures, the PADEP mining regulations introduce other angles of influence:
§89.142a(b)(ii) uses a 30-degree angle of draw within which the pre-mining condition of structures is to be surveyed.
§89.142a(c)(2) uses a 15-degree angle of draw around structures and a 30-degree angle of draw for areas to be monitored.

[23] Groundwater as an environmental constraint of longwall coal mining, Environ. Geol. (2006) 49: 796–803 DOI 10.1007/s00254-006-0173-9 8 p.

The second Act 54 Report (California University of Pennsylvania 2005) included a discussion of the 35° angle "presumptive zone of influence" and determined that because overburden thickness can vary significantly, a fixed angle may not be an appropriate measure. That Report's preparers proposed a horizontal distance (of 328 feet, or 100 meters) as a possibly better predictor of where water supply impacts were likely to occur 80% of the time than the 35° angular measurement (why 80% was used as a cutoff was not stated). The third Act 54 Report (University of Pittsburgh 2011) noted that more than 22% of the mine-related water supply impacts documented by the CDMO during the 2003-2008 period occurred beyond the 35° angle zone.

Thus, even if a 35° angle zone once was relevant, it is questionable whether it remains so more than 20 years later as longwall panel dimensions have increased significantly. A computer program developed at Virginia Tech, called Surface Deformation Prediction System (SDPS), is much more conservative, suggesting 67° as the average angle of influence value to be used for damage prediction in the Appalachian coalfields[24]. This SDPS program reportedly was used by Consol in determining how close its mining could safely approach the Duke Lake Dam in Ryerson Station State Park (about 4 miles west of the proposed Foundation Mine), and yet that dam structure was damaged anyway (PADEP 2010). The presumptive zone of influence of longwall mining as currently used by the CDMO clearly is obsolete and is not protecting hydrologic or other resources.

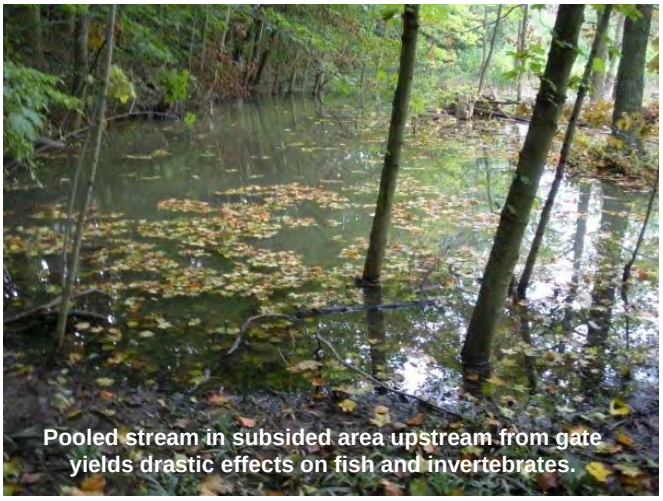
The Foundation Mine applicant offered no assurance that it incorporated accurate predictions of water supply or other hydrologic impacts. It is unclear what bases were used for predicting such impacts. In Module 8 of the 2010 application, 194 entries were listed on Form 8.3A as water supplies, including 89 wells and 105 springs. This presumably was the full inventory of existing water supplies at risk within the proposed 9,438-acre mine permit area. On the Background Report inventory (Form 8.4A) those 194 wells and springs were again listed along with the date or dates they were tested for water quality (but not quantity) parameters. On Form 8.6A (Monitoring Program Summary), 11 wells, 6 springs (one of which was listed twice), and 6 piezometers were listed as those which would be monitored every three months and reported to the CDMO to determine hydrologic changes once mining activities got underway. Not explained was why only 12% of the wells and 6% of the springs (rather than all of them) were proposed to be monitored once mining activities got underway.

Predicting Pooling

Pooling in streams caused by longwall mining causes increased sedimentation, which degrades the aquatic habitat for fish and macroinvertebrates, and causes long-term instability in the stream (USFWS 2004). In the 1980s Dr. Syd S. Peng, a mine

[24] Surface Deformation Prediction System for Windows, Version 5.2, Quick Reference Guide and Working Examples, February 2002, Dr. Zacharias Agioutantis and Dr. Michael Karmis, Department of Mining and Minerals Engineering, Virginia Polytechnic Institute and State University

engineer at West Virginia University, developed a model to predict where longwall mining subsidence would result in stream pooling. The Peng computer model[25] currently is used to predict which streams may experience pooling when surface subsidence creates a "basin" behind an unsubsided gate. The model is based on such factors as depth of mining, rock type, and gradient of the stream. The CDMO requires applicants to predict potential pooling, but only where the stream gradient is 2% or less, and then only requires submission of a mitigation/restoration plan for any stream where pooling is predicted to be 1 foot or more in depth (see Module 8.10 and TGD 563-2000-655).



Pooled stream in subsided area upstream from gate yields drastic effects on fish and invertebrates.

It is unclear what scientific basis was used to establish those regulatory thresholds, or whether significant impacts to a stream also occur if the stream gradient is greater than 2% or the depth of pooling is less than 1 foot. The Peng model now is more than 2 decades old. No recent studies have been done to evaluate whether those thresholds continue to be relevant to subsidence from modern longwall mine practices, or whether they should be more stringent for Special Protection streams. The Peng model does not forecast or evaluate how the predicted pooling will alter the biological condition of any stream, including its effects on the numbers, diversity, or kinds of fish, macroinvertebrates, and other stream biota present before mining. The model does not predict how long the pooling will last or how expensive will be the work necessary to "fix" the damage to the stream, if it can be remediated at all. It also does not address streambed heaving. No recent studies have been done to evaluate the biological consequences related to stream pooling.

For the Foundation Mine, there was a total of at least 21 separate segments of streams where pooling was predicted, according to application Module 15. Only 4 of the expected stream pooling incidents were calculated to be more than 1 foot deep, and thus only those 4 streams were expected to require restoration per TGD 563-2000-655. For the remaining 17 segments where some pooling was expected, all of which are Special Protection waters, no monitoring was proposed to determine whether the actual pooling occurred as predicted, or whether the pooling would affect the water quality or biota in the streams.

[25] Comprehensive and Integrated Subsidence Prediction Modeling (CISPM) was developed in the 1980s and early 1990s (Peng & Chiang 1984, Peng 1992, Peng & Luo 1994).

Predicting Other Hydrologic Impacts

While stream pooling can be predicted to a certain extent (although not the biological consequences of that pooling), the same is not true of stream flow loss. Module 8.9 asks applicants to "*provide a prediction of the location, magnitude, and duration of mining induced flow loss*", but there is no tool available to predict flow loss comparable to the Peng model for predicting pooling. Coal companies apparently lack either the ability or the motivation (or both) to predict where specific streams, springs, and wetlands will dry up. Yet flow loss occurs, and it occurs often. Of the 55 incidents[26] of stream damage documented between 2003 and 2008 in the third Act 54 report (University of Pittsburgh 2011), 52 were incidents of flow loss (one other included both pooling and flow loss). In December 2012, the CDMO advised a coal operator that six separate streams which had been dewatered by its longwall mining, and for which flow could not be restored after multiple years of attempted restoration, were being considered permanently adversely impacted (Appendix B).

Mine operators presumably have been monitoring streamflow above longwall-mined areas on a weekly and even daily basis since full implementation of the TGD 563-2000-655 more than 5 years ago, although such results are not routinely reported to PADEP or made available for public review. One would expect that by now the voluminous data that have been compiled could and would be used to more accurately predict, or at least to develop models to predict, where and under what circumstances flow loss is likely to occur in streams above longwall mines in southwest Pennsylvania.

There is no tool available to predict flow loss comparable to the Peng model for predicting pooling. Coal companies apparently lack either the ability or the motivation (or both) to predict where specific streams, springs, and wetlands will dry up.

As with flow loss in streams, no models have been developed to predict where wetlands are likely to be adversely impacted --- whether by pooling, water loss, or other hydrological changes from longwall mining. Yet Section 8.12 of the current Module 8[27] would lead one to believe that such predictions are possible, even expected of applicants: "*If predictions show that one or more wetlands are likely to experience adverse effects, provide an alternatives analysis*...." This directive is routinely ignored because no wetlands ever are predicted to be adversely affected. For the 2010 Foundation Mine application, in the response to Module 8.5 regarding the potential for altering the hydrology of wetlands, the applicant claimed: "...*the large vertical*

[26] All 55 incidents were attributed to longwall mining, none to room-and-pillar or retreat mining [where secondary remining reduces or eliminates coal pillars initially left underground to support the mine roof]. There were 8 longwall mines, 36 room-and-pillar mines, and 6 retreat mines active during that five-year period.

[27] The Foundation Mine application used the obsolete Module 8 revised in 2001, rather than the 2008 version that should have been used, so there was no Section 8.12 included.

separation (at least 620 feet minimum) should preclude any adverse effects that mining activities may have on dams, ponds, impoundments and wetlands which overlie the underground permit area." No documentation to support that optimistic predictive claim was provided.

One of the more visible and significant recent hydrologic impacts to occur as a result of longwall mining was one that was not predicted. In 2005, longwall mining associated with the Bailey Mine caused ground movement and structural cracks in the dam on Duke Lake at Ryerson Station State Park (PADEP 2010[28]). To avoid possible flooding and other consequences downstream, the dam was breached by PADCNR and Duke Lake was drained. This 62-acre Lake, once a major recreational resource and tourist attraction (and the largest lake in Greene County), remains dry almost a decade later. The mining that is believed to have been the cause of the damage did not extend beneath the dam, and in fact stayed hundreds of feet horizontally away from it, well beyond the 35^{o} angle zone. As noted above, the SDPS model was used in that case, but even its more conservative use of a 67^{o} angle of influence proved to be insufficient to predict or prevent damage to the dam. Clearly, the models currently being relied upon for predicting hydrologic and other damages from longwall mine subsidence are of questionable reliability and need to be re-evaluated before any new or expanded longwall mines are approved.

Recommendations: Existing models and techniques for predicting pooling and other potential hydrologic impacts must be re-examined and updated to reflect the realities of modern longwall mining practices. A model must be developed specifically to predict streams at greatest risk of flow loss. Accurate predictions of impacts to the hydrologic balance will not be made unless and until the CDMO consistently requires mine applicants (a) to collect and report pre-mining data on all the surface water and groundwater resources of the area, (b) to use that information to model existing hydrologic patterns, (c) to monitor and report surface water and groundwater resources during mining and post-mining, (d) to compare changes observed between pre-mining and post-mining periods, and (e) to enter all relevant data into a region-wide database that will enable it to be utilized in analyzing and evaluating future mine applications. The CDMO should take the initiative to collect all existing relevant data from all mine operators and commission its own analysis to model hydrologic conditions.

[28] PADEP concluded, among other things, that "[p]revious documented incidents show that longwall mining has the potential to cause mining induced movements and damage at distances beyond the areas where customary subsidence theory would predict such impacts."

F PROTECTION OF *SPECIAL PROTECTION* WATERS

F1 - Special Protection Waters in Greene County

Under federal Clean Water Act regulations (40 CFR 131 et seq.), States that elect to administer the federal law are required to adopt antidegradation policies that meet minimum federal requirements. Each State must include an antidegradation policy as an element of its surface water quality standards program.[29] The Pennsylvania antidegradation program, as reflected in 25 *Pa. Code* Chapter 93 (Water Quality Standards[30]), acknowledges that existing water quality and uses have inherent values worthy of protection and preservation (§§ 93.4a-4d). Every stream in the Commonwealth has a "designated" use identified at §93.9a-93.9z.

The basic concept of antidegradation is to maintain and protect existing water quality of the very best waters, and to protect and restore existing uses for all surface waters. In Pennsylvania, the very best waters are those identified as Exceptional Value (EV) and High Quality (HQ) waters. The antidegradation program in Pennsylvania recognizes EV and HQ waters as "Special Protection" waters, and §93.4a provides additional levels of protection for such waters.

Throughout Pennsylvania, only 4% of all streams have been recognized as qualifying as Exceptional Value (Outstanding National Resource Waters), and an additional 27% are recognized as High Quality (DRN 2011). Two major watersheds in west-central Greene County are designated HQ-WWF (High Quality - Warm Water Fishery): Browns Creek and South Fork Tenmile Creek. Together, these two watersheds encompass approximately 115 square miles. The proposed Foundation Mine was located almost entirely within these Special Protection watersheds (**Figure 10**).

Periodically, the PADEP will measure the specific physical and biological conditions of a stream and sample its water quality to determine the actual current condition of the stream, or its "existing use." When examined in detail, it is not uncommon to find a stream or segment of a stream to be attaining higher uses than its current Chapter 93 "designated" uses. This is especially the case in the undisturbed forested headwater sections of streams such as are found in the rural hollows of Greene County. Indeed, during the past several years, as a result of stream surveys conducted by the PADEP Division of Water Quality Standards and others, 7 streams in Greene County were redesignated to EV from lesser uses[31] (Stout 2009; Schmid and Company, Inc. 2009).

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[29] Federal antidegradation protection of Pennsylvania streams having quality better than necessary to sustain their designated use was compelled by the federal court in Raymond Proffitt Foundation v. USEPA (930 F. Supp. 1088, 16 April 1996). Federal oversight of the Commonwealth antidegradation requirements were not rescinded by USEPA until 2010.

[30] http://www.pacode.com/secure/data/025/chapter93/chap93toc.html

[31] http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/ Existing%20Use/Co30(Greene).pdf

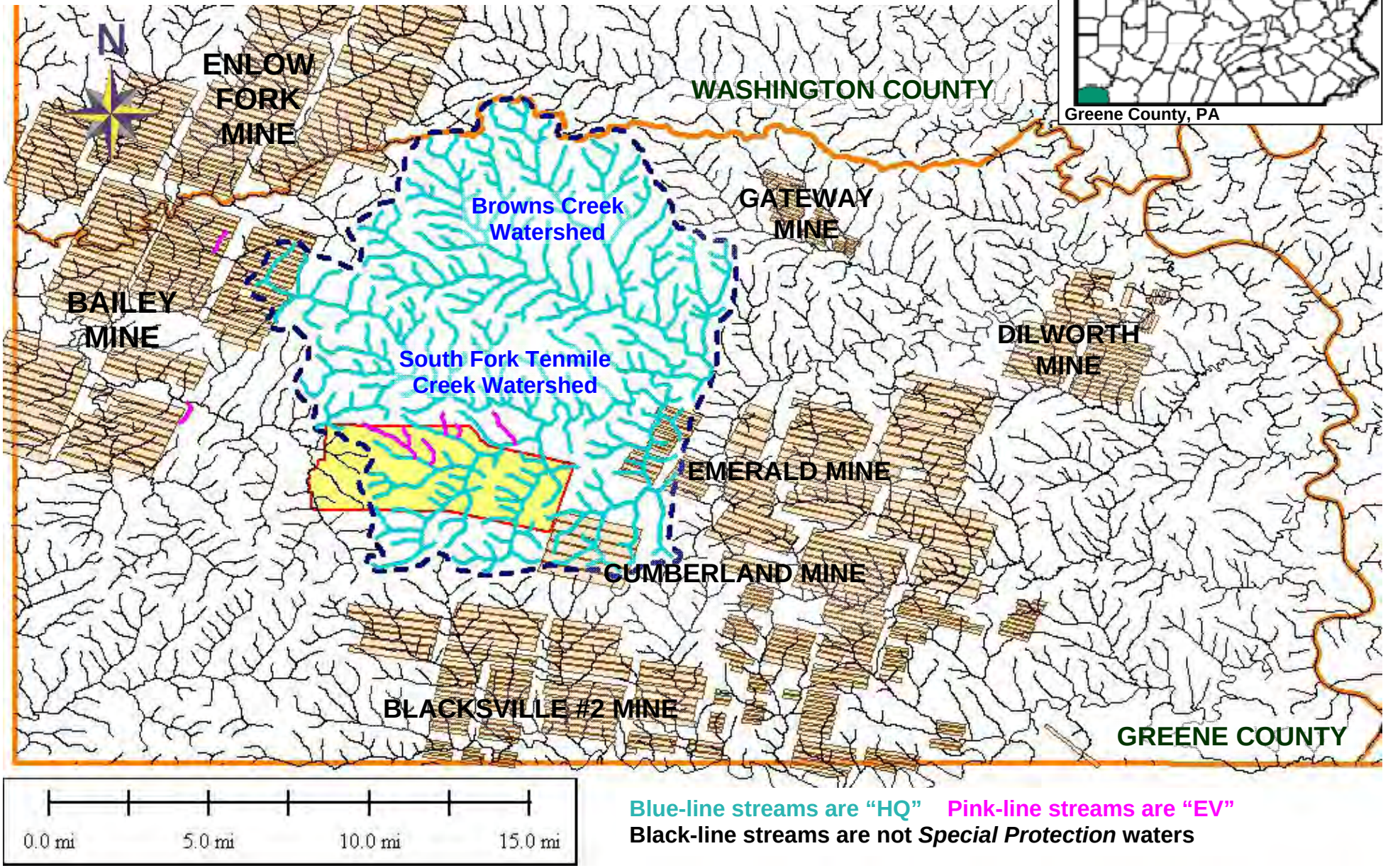


FIGURE 10. Location of the proposed 9,438-acre **Foundation Mine** (yellow shading) in relation to two major "Special Protection" watersheds (Browns Creek and South Fork Tenmile Creek; dark blue dashed outline) in Greene County that have largely been avoided by previous longwall coal mines. Existing longwall panels (outlined in brown) vary in width --- the more recent ones are noticeably wider. County boundaries are in orange.

By comparison, there are no EV streams yet recognized in either Washington County or Allegheny County. It is likely that additional streams in Greene County, not yet formally recognized, also are attaining Exceptional Value uses.

The Foundation Mine application provided the CDMO the opportunity to determine whether any of the streams in the project area had existing uses higher than their designated uses. Existing use protection is required to be provided for a waterbody segment whenever PADEP takes a final action on a permit application potentially affecting its quality. In accordance with §93.4c(a)(1):

> (i) Existing use protection shall be provided when the Department's evaluation of information (including data gathered at the Department's own initiative, data contained in a petition to change a designated use submitted to the Environmental Quality Board pursuant to §93.4d(a), or data considered in the context of a Department permit or approval action) indicates that a surface water has attained an existing use.
>
> and
>
> (iv) The Department will make a final determination of existing use protection for the surface water as part of the final approval action.

Since October 2007, in accordance with the current TGD 563-2000-655, all longwall mine applicants have been required to collect detailed pre-mining bioassessment data on streams proposed to be undermined, including their physical characteristics, their water quality, and their biota and habitat. The bioassessment data collected for the proposed Foundation Mine should be examined carefully by PADEP professionals qualified to determine whether any of the streams are likely to have existing uses better than their currently designated uses, and if so, to protect those streams at their higher uses. In reviewing those data, however, PADEP must be careful to disregard the specific data which previously were used by this particular mine operator in its failed petition to downgrade certain streams here from HQ to WWF. Those data subsequently were discredited when several of those very same streams were found to be eligible for upgrading to Exceptional Value.

F2 - Impacts on Special Protection Waters

Of the 7 Exceptional Value streams currently recognized in Greene County, four flow above the underground mine permit area that was proposed for Foundation Mine; a fifth EV stream is just outside that area. Heretofore, most longwall mines have remained outside the "Special Protection" watersheds of South Fork Tenmile Creek and Browns Creek (see Figure 10). The proposed Foundation Mine was the first new longwall coal mine in Pennsylvania ever sited primarily within Special Protection watersheds. Because of its potential impacts on EV and HQ waters, all aspects of that application deserve a greater degree of scrutiny than the CDMO typically accords to existing mine expansions in "ordinary," non-Special Protection watersheds.

Special Protection waters, like any other waterway, can be impacted in numerous ways by longwall coal mine operations. Streams can be encroached upon directly by the construction of new surface facilities, or by changing the nearby landscape from mostly forest to heavy industrial uses and by altering hydrologic patterns through regrading, the placement of impervious cover, and the installation of stormwater controls such as diversion ditches. Mine waste water discharged into streams via point or non-point sources can degrade water quality. The inevitable subsidence from longwall mine operations can disrupt streams directly by physical changes or indirectly by altering the local hydrology. Subsidence also can allow methane gas, radon gas, or other pollutants trapped under ground to migrate into groundwater or surface waters. If post-mining stream restoration is required, those activities themselves can further affect the stream and its associated wetlands. Stream impacts can be identified most reliably by careful post-mining sampling of aquatic macroinvertebrates and comparison of results with pre-mining background data.

Module 24 was the only section of the underground mine application that specifically addressed "Special Protection" waters[32]. This Module was required wherever there was a proposed surface point-source *discharge* to a Chapter 93-designated "EV" or "HQ" waterbody. Most underground mining to date in Pennsylvania has occurred beneath streams that are not recognized as Special Protection waters. Thus, Module 24 has rarely been used. In instances where longwall mining beneath Special Protection waters has occurred, it typically has been near the periphery of a mine, so that any associated surface discharge (*e.g.*, from a treatment plant or a sediment basin) could be directed to a non-Special Protection water. All proposed discharges for Foundation Mine in 2010 were to HQ streams, so a Module 24 was completed. The requisite socioeconomic justifications provided by the applicant in Module 24 were weak (see Module 24 discussion in Appendix A).

According to the PADEP Water Quality Antidegradation Implementation Guidance[33], projects "*subject to a DEP permit or approval that may affect an EV or HQ surface water but do not involve a* [point-source] *discharge*" also must be reviewed by PADEP in a way that "*evaluates the effect of the proposed activity on surface water and requires that the use of the surface water be maintained and protected*". As mentioned above, other aspects of a longwall mine operation (besides discharges) can and do impact surface water quality. Except for discharges, however, at present there is no practical difference in the data required in longwall mine applications when the operation is proposed in or beneath EV or HQ streams or when it is proposed in or beneath streams having other use classifications. This is a major deficiency in the current CDMO review process for mine applications.

32 Since February 2012, Module 24 "Special Protection Waters" has been rescinded. Form 5600-PM-MR0007 "Anti-Degradation Supplement for Mining Permits" now is to be used where a mining operation is proposed for Special Protection waters. The 2010 Foundation Mine application, submitted prior to this change, used the 2001 revision of Module 24.

33 Technical Guidance Document 391-0300-002, dated 29 November 2003, 137 pages.

Disturbances associated with the construction of surface facilities for the Foundation Mine were proposed in or within 100 feet of more than 4.6 miles (24,446 linear feet) of Special Protection streams [actually, more than 12 miles according to the Corps 404 permit application]. More than three-quarters of the required stream-buffer variances entailed impacts not just within 100 feet of, but directly to the streams themselves. As noted above in C1, according to the Water Quality Antidegradation Implementation Guidance (PADEP 2003), variances involving HQ or EV waters can be granted only where they will result in an environmental improvement. Yet the fact that the proposed Foundation Mine disturbances were to Special Protection streams was not highlighted in any way, in large part because the information elicited by the Modules used in an underground mine application made no such distinctions that might actually induce special protection.

One proposed impact to an existing-use EV stream involved 199 linear feet of cut and fill in a tributary of Hoge Run (UT 40633) to accommodate the relocation of Hoge Run. Additionally, a 0.256-acre wetland "HOGE-2", just west of that EV stream, would be entirely obliterated. HOGE-2 clearly meets the defining criteria for an "Exceptional Value wetland" per 25 *Pa. Code* §105.17(1)(iii); thus it, too, is an EV water per 25 *Pa. Code* § 93.4b, and so its degradation is prohibited. Another impact proposed to an EV stream involved the installation of the water supply pipeline (not part of the 2010 State mine application, but identified on the Corps 404 application), which unnecessarily would impact a section of UT 40629, a tributary to McCourtney Run. Horizontal drilling beneath this EV waterway could eliminate the impact of a surface crossing, but that was not proposed. The proposed impacts to EV waters appeared to violate State and Federal anti-degradation standards, but were not recognized as such by the CDMO in its review of the Foundation Mine permit application.

The single largest impact to a Special Protection water acknowledged in the Foundation Mine application involved the proposed relocation of nearly a mile (4,924 linear feet) of Hoge Run to allow construction of the Slope Pad and Preparation Plant. The relocated section of that HQ stream would have been made straighter (fewer meanders), and in the process its overall length would have been shortened by 807 linear feet. Not only was the Special Protection status of that section of Hoge Run not acknowledged or evaluated in the Foundation Mine application, but only the net loss of 807 feet was acknowledged by the applicant as an impact at all (since the balance would have been replaced by the straightened ditch, it was viewed by the applicant as a "wash").

Although the relocation narrative *claimed* that enhancements proposed to be provided would result in an overall improvement to the stream, no monitoring plan was proposed to evaluate the relocated stream and ensure that its pre-mining "HQ" uses would be maintained or restored, much less enhanced. The applicant stated in Module 15.2.o that "*it is anticipated that this new stream segment will be re-colonized by benthic organisms*". One would certainly hope that *something* would recolonize and be able to live in the relocated and straightened artificial channel of Hoge Run. The real question,

however, was whether the biological health of this relocated stream would be as good as (per the Clean Streams Law) or better than (per the antidegradation guidance) the existing stream and would at minimum maintain its HQ uses.

The applicant ran a HEC-RAS hydraulic analysis to document that the physical capacity of the relocated stream would be equivalent to the existing conditions in handing flooding, but no pre-relocation or proposed post-relocation bioassessment (similar to what would be required under TGD 563-2000-655 if the proposed impact was to be pooling or flow loss) was proffered. The CDMO made no attempt to require the applicant to demonstrate that the biological quality of the HQ stream would not be affected.

One study of West Virginia streams (Stout 2004) found that longwall mining adversely affects the abundance and diversity of aquatic biota, and that impacted streams failed to recover to their premining physical, chemical, or biological conditions after more than a decade. Another study (Doyle and Shields 2012) found that physical manipulation of streams typically is not adequate to restore the biological function or water quality of damaged streams. In the 2010 Foundation Mine application there was no proposed demonstration or documentation of how the relocated Hoge Run might be successful in restoring its HQ biota. There was no discussion of how long the restoration would take, or what would be done as contingent mitigation should the proposed restoration fail, as has happened at numerous other streams damaged by nearby longwall mines. There was no more information on the other HQ streams proposed to be impacted by the Foundation Mine than there was for Hoge Run. In short, there was no compliance with the relevant antidegradation requirements in the 2010 application.

Recommendation: Special Protection waters must be afforded the special protection they are required to receive under existing federal and Commonwealth laws and regulations, and not simply lip service. All Special Protection waters within each longwall mine project area must be clearly identified. All proposed impacts to Special Protection waters, direct as well as indirect, from surface activities as well as underground, must be avoided or minimized as much as possible. Any remaining impacts must be fully documented, justified, bonded, mitigated, and monitored. A convincing demonstration of enhancement or environmental improvement must be made for each affected HQ stream, along with convincing socioeconomic justification.

G LONGWALL MINING AND ACT 54

Act 54 was passed by the Pennsylvania General Assembly in June 1994, twenty years ago. It amended the 1966 Pennsylvania Bituminous Mine Subsidence and Land Conservation Act. Act 54 marked a turning point in the regulation of underground coal mining in Pennsylvania --- it ended a 28-year outright prohibition

on damage to surface structures that had withstood industry challenges in state and federal courts. Act 54 specifically *allowed* surface damages to occur as a result of underground coal mining. A fundamental concept used to promote Act 54 was the idea that "if you break it, you must fix it". Coal operators expressed a willingness to be responsible for timely repair or mitigation of any damages their longwall mining may cause, in exchange for the opportunity to use the newer technology. In reality, however, significant damages have occurred that have not been repaired, and additional damages are occurring that are not even being recognized.

Since 1994 only one method of underground coal mining has been causing most of the damage in Pennsylvania --- longwall mining. Traditional room-and-pillar coal mining[34] provides surface support in the pillars, but a longwall mine extracts virtually all of the coal within huge "panels", leaving no coal in place for roof support. Widespread subsurface cracking and irregular surface subsidence of several feet is not uncommon above a longwall mine panel. As longwall mining technology has advanced, the width of the panels has increased -- from about 500 to 600 feet in the early 1980s to 1,500 to 1,600 feet today. When the width of a longwall panel exceeds the depth of mining, it is said to be "supercritical", meaning that its maximum surface subsidence potential (and the resulting effects) are certain to occur (University of Pittsburgh 2011). The advances in the technology for longwall mining have outpaced both changes in regulatory requirements and the ability of the regulatory agencies to control the impacts from subsidence. Unlike in Europe and Asia, little attention has been paid in the United States to improving mining technology toward the goal of minimizing subsidence through measures such as backstowing[35].

One of the requirements of Act 54 was that an analysis of the impacts of underground coal mining was to be prepared by PADEP at five-year intervals beginning in 1993. There have been 3 such five-year analyses completed to date; the most recent was released by the PADEP during January 2011 (University of Pittsburgh 2011). The fourth Act 54 Report, covering the period August 2008 to August 2013, is planned to be released in August 2014.

Like the first two, the third Act 54 Report identified serious, significant, and increasing problems associated with longwall coal mining[36], problems that were not expected and

[34] The third Act 54 Report (University of Pittsburgh 2011) reveals that room-and-pillar (R&P) mining continues to be a viable and profitable method of extracting coal. Of the 50 mines active during the assessment period (2003-2008), most (36, or 72%) were traditional room-and-pillar mines. The acreage of active R&P mines more than doubled as compared with the prior assessment period, while the acreage of active longwall mines decreased by 11%. In total, the 8 active longwall mines undermined fewer properties than traditional room-and-pillar mines (1,572 vs. 1,738), yet longwall mining accounted for the vast majority of reported damages and unresolved incidents.

[35] Backstowing involves the backfilling of underground voids created by mining using coal waste from the surface in order to reduce or eliminate the possibility that subsidence will cause material damage to, or reduce the reasonably foreseeable use of, surface structures and features. It also eliminates surface waste piles.

[36] Schmid & Company, Inc., Consulting Ecologists. 2011. The increasing damage from underground coal mining in Pennsylvania, a review and analysis of the PADEP's Third Act 54 Report. Prepared for the Citizens Coal Council. Media PA. 50 p. www.schmidco.com/17April2011SchmidAct54Analysis.pdf

not supposed to happen when Act 54 was passed. The third Act 54 Report indicated that mine-related impacts to structures, water supplies, and natural features continue to increase, that identified impacts are primarily a result of longwall mining (rather than room-and-pillar mining), that full repair or restoration of impacts is seldom attempted by longwall mine operators, and that resolution of longwall mine impacts is taking a very long time, sometimes many years, as compared with the less frequent damages caused by room-and-pillar mines. The third Act 54 Report documented that traditional room-and-pillar underground mining entails far less damage to structures and water supplies with much more timely resolutions than longwall mining. Similar trends are evident in the information provided in the first two Act 54 Reports (PADEP 1999/2001, California University of Pennsylvania 2005).

The 2010 Foundation Mine application at least indirectly acknowledged the disproportionate potential for damage associated with the proposed longwall mining methods. Most surface facilities vital to the operation of this mine, if undermined at all, were sited above areas to be mined by the less damaging room-and-pillar methods; this same consideration unfortunately was not afforded to other surface owners or to the public's sensitive environmental resources. In Module 13, for example, it was noted that:

> *Little or no subsidence is expected on the impoundment structures since impoundments will be located above the proposed development workings (room and pillar) of the mine.* [Section 13.1.d]

Clearly, mine operators can and do use room-and-pillar methods within longwall mines to protect surface features important to their industrial operations.

<u>Recommendation</u>: The findings of the Act 54 Five-Year Reports must not be ignored by the CDMO during permit reviews. Any proposed new or expanded longwall operation must be evaluated in light of the widespread and disproportionately greater damage now known to be associated with longwall methods of coal extraction. At a minimum, the CDMO must require applicants to evaluate and assess the use of methods and practices of coal extraction that are documented to be less-damaging A) for the entire operation, B) beneath Special Protection waters, and C) beneath historic structures and other sensitive features.

H LONGWALL MINING AND THE PENNSYLVANIA CONSTITUTION

The concept of the "public trust doctrine", codified some 1,500 years ago during the Roman Empire, holds that certain of Earth's riches should never be claimed exclusively for private use, but must be left for the public's enjoyment and must be

stewarded by those in power (Takacs 2008). This concept is firmly embedded in Article 1, Section 27 (Declaration of Rights), of the Pennsylvania Constitution.

Clean water and clean air are among the basic Constitutional rights afforded to all Pennsylvania residents, and the PADEP is among the agencies of the Commonwealth that must act as Trustee of these resources. Article 1, Section 27, should preclude the PADEP from allowing or enabling predictable and intentional environmental degradation, especially to resources not owned by any single individual.

PENNSYLVANIA CONSTITUTION Article 1, Section 27

The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people.

As proposed in 2010, construction of the Foundation Mine's surface area facilities would directly impact more than 12 miles of HQ and EV streams, and at least 27 wetlands, including Exceptional Value wetlands. Subsidence associated with the proposed longwall mine operation would cause additional streams to pool and others to lose water, in some cases perhaps permanently; it would induce changes to groundwater that would cause some springs, wells, wetlands, and ponds to go dry; and it would change the hydrologic balance in ways that were not identified by the applicant or evaluated by the CDMO. Most of these impacts would not be mitigated. If the CDMO had granted a permit for the Foundation Mine project as it was proposed, it would have violated its fiduciary duties under the Pennsylvania Constitution.

As Trustee of the natural resources of this Commonwealth, the PADEP has the duty[37] to evaluate the immediate and long-term impacts, both individual and cumulative, on each element of the Public Trust assets affected by its decisions, including (in this case) impacts to some of the very best waters in the Commonwealth which have been recognized as having EV and HQ uses. As Trustee, the PADEP has the Constitutional obligation to compel an applicant to restore damaged natural resources to the same quality and ecological diversity that existed before being impacted by coal extraction for private profit, and to replace those lands and waters that will be permanently or semi-permanently damaged by industrial use by coal facilities with other lands and waters of equivalent value for the use and enjoyment of the people of the Commonwealth.

[37] According to a 2013 opinion written by Pennsylvania Supreme Court Chief Justice Castille, "*As trustee, the Commonwealth has a duty to refrain from permitting or encouraging the degradation, diminution, or depletion of public natural resources, whether such degradation, diminution, or depletion would occur through direct state action or indirectly, e.g., because of the state's failure to restrain the actions of private parties.*" http://www.pacourts.us/assets/opinions/Supreme/out/J-127A-D-2012oajc.pdf

I REGIONAL, NATIONWIDE, AND GLOBAL IMPLICATIONS OF LONGWALL MINING

A new longwall operation such as the proposed Foundation Mine would cause impacts that typically are not disclosed or evaluated in a Pennsylvania underground mine application. One such impact is the effect the mine would have on the local and regional economy. This matter was marginally addressed by this applicant in the Module 24 social and economic (S&E) justification for discharges proposed to High Quality waters. In its S&E discussion the applicant focused on the jobs and tax revenue that the proposed Foundation mine would generate during its 20+ year lifetime. Ignored in that evaluation were the adverse impacts that the mine would have, and indeed already has had, on the local economy and community.

The applicant (or one of its subsidiaries[38]) already has acquired many thousands of acres of surface land in and around the town of Holbrook in preparation for construction of the proposed surface facilities for the Foundation Mine. Many of the newly acquired properties formerly belonged to residents, farmers, and small business owners in this rural part of Greene County. As people sold their land to the coal company and moved away, it created a domino effect, causing more people to sell their lands and businesses to move out. As friends, neighbors, and customers left, even more people sold their land, not wanting to be the only ones left behind amidst a sprawling industrial complex that would be similar to the Bailey Prep Plant already operating in the northwestern section of the county. Evidence of this community disruption and fragmentation is clear today as one drives around the area and observes abandoned farms and buildings (**Figure 11**).

Agriculture[39] and tourism historically have been important to the economy and communities of rural Greene County. Even before any permit decisions were reached, the proposed Foundation Mine had impacted both. If it were to begin operations, the quiet rustic atmosphere of this part of northern Appalachia would be replaced by intensive industrial operations for at least several decades.

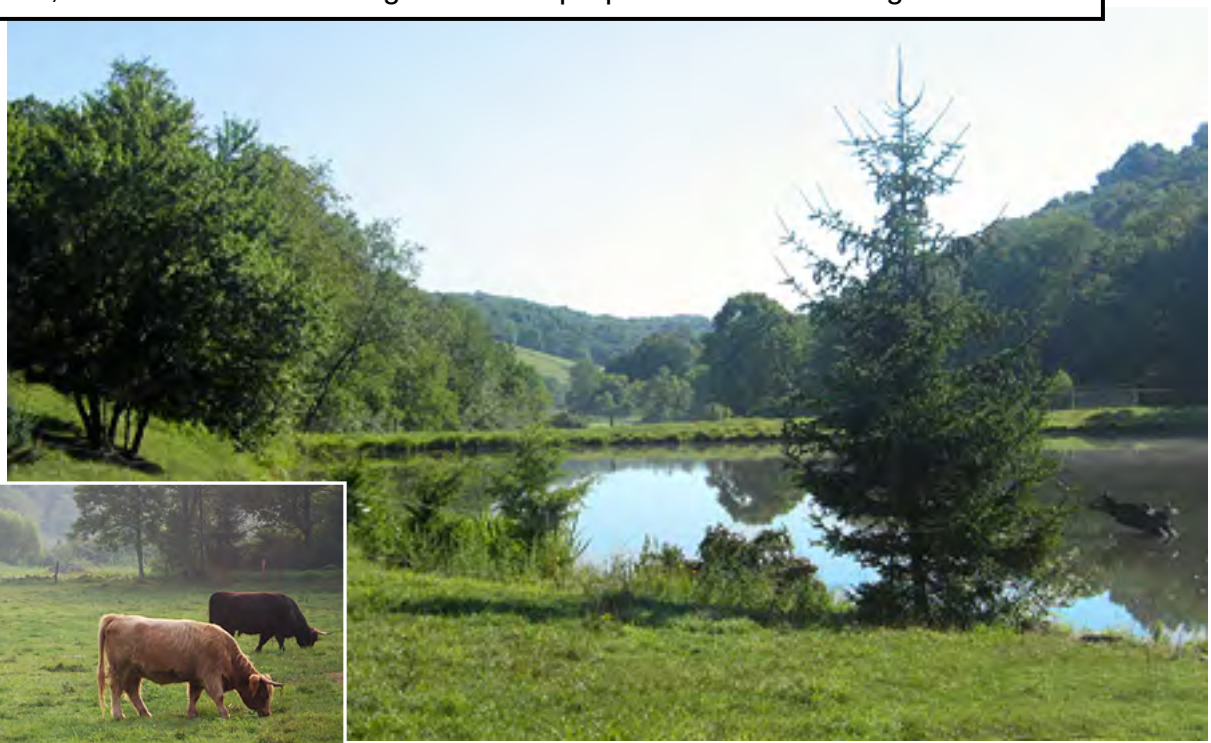
A restored 19th century Victorian home along Bristoria Road, just west of Holbrook, was placed on the market specifically because of the proposed Foundation Mine (**Figure 12**). This home had operated successfully as a bed-and-breakfast. It was part of a 45-acre working farm where Scottish Highland cattle and laying hens were being sustainably raised. The owner had hoped to retire here, but the prospect of the loss of water from longwall subsidence and the disruption to the serenity of the

[38] In particular, PA Land Holdings Corp., the real estate arm of Alpha Natural Resources in Pennsylvania.

[39] There are more than 63,000 farms covering more than 7.8 million acres in Pennsylvania. The annual market value of Pennsylvania agricultural products is more than $5.8 billion (USDA 2009). By comparison, the gross benefit stemming from coal-related taxes amounted to approximately $26.5 million in FY 2010-11, representing only 0.1% of total General Fund revenues from state taxes; overall, coal represented a net cost of $164.9 million to the Commonwealth state budget that year (Downstream Strategies 2012).

FIGURE 11. These vacant buildings are evidence of the community disruption already caused by the purchase of farms, businesses, and homes in the vicinity of Holbrook to make way for the proposed Foundation Mine.

FIGURE 12. This 45-acre working farm along Bristoria Road west of Holbrook was placed on the market. It is located above a longwall panel of the proposed Foundation Mine, which threatens its stream, wells, springs, and pond. Its owner, who had operated a bed and breakfast in a restored 19th century Victorian home (at left, above), believed she could not continue to raise cattle and hens, or operate a tranquil B&B, in the face of the changes that the proposed Mine will bring to this area.



area from surface facilities planned nearby made continued operation of this farm and B&B untenable.

The federal Office of Surface Mining Reclamation and Enforcement (OSMRE) is the ultimate authority for coal mining regulation in the United States in accordance with the Surface Mining Control and Reclamation Act of 1977 (SMCRA). One of the basic purposes of SMCRA is to assure that the nation's coal mines operate in a manner that protects communities and the environment during mining operations and restores the land to productive uses following mining. Under Section 503(a) of SMCRA, individual States can assume "primacy" of administering federal mining regulation if they have developed a regulatory program that meets all of the federal requirements. Like most States where coal mining is conducted, Pennsylvania has assumed primacy. The mere existence of a state regulatory program, however, does not ensure its proper administration. OSMRE maintains oversight authority, and is authorized to revoke the Commonwealth's primacy if PADEP fails to effectively implement and enforce its approved regulatory program.

The review of the Foundation Mine application by PADEP illustrates many of the same issues that arise in the ten other states where longwall mining of coal is conducted[40]. Surface landowners in all of those states are being forced to deal with many of the same issues as the 2010 Foundation Mine application and that are being experienced elsewhere in Pennsylvania, including:

- loss, diminution, or pollution of water supplies, typically with inadequate characterization of pre-mining well yields so that full damage is not disclosed and full replacement is not assured
- inadequate justification for activities proposed within 100-foot Stream Buffers
- alteration of streamflow (either by pooling or dewatering), typically with inadequate characterization of pre-mining physical and/or biological conditions so that restoration seldom is achieved and rarely is documented
- failure to protect the highest quality watercourses against degradation
- disruption of community cohesion as homeowners and businesses move away after being bought out or damaged by a coal operator
- material damage to the land surface, including to prime farmland, and the consequent loss of agricultural activity and productive land use
- piecemealing of mine project approvals to minimize or understate impacts
- failure of applicants and regulatory agencies to document the premining hydrologic systems adequately or to assess impacts to the hydrologic balance
- failure to adequately establish and enforce protective NPDES discharge limits
- disproportionate impacts on poorer and environmental justice areas where landowner resistance is weakest.

[40] According to data compiled by the US Energy Information Administration (EIA 2013), the 11 states reporting longwall mine coal production in 2012 were (from most to least): West Virginia, Pennsylvania, Illinois, Colorado, Utah, Ohio, Alabama, Montana, New Mexico, Wyoming, and Virginia.

The CDMO review of the 2010 Foundation Mine application failed to require any analysis of alternative methods of coal extraction to the proposed use of longwall mining technology. One very real alternative that was not evaluated, but should have been, is that of room-and-pillar (R&P) extraction. R&P methods in any event would have been used as part of the development of the longwall mine --- the gates and entries to be developed around the huge longwall panels would have been mined by R&P methods. R&P methods also would have been used beneath surface activities, such as the preparation plant and water impoundment, subsidence damage to which the applicant sought to avoid. If such methods can reliably prevent damage to surface features important to the applicant, they should be employed to prevent damage to surface features important to present and future residents, farmers, businesses, fishermen, and other outdoor enthusiasts and recreationalists whose use and enjoyment of the land will endure far longer than the “temporary” mining of coal but for the irreversible damage from its proposed conversion to heavy industry. Use of R&P methods also should be evaluated for the voids it would create underground, and the potential for cost-effective backstowing of refuse material, thereby eliminating the need for massive, unsightly, and potentially polluting surface coal refuse disposal areas in Special Protection streams.

The CDMO failed to evaluate the ultimate purpose of the proposed Foundation Mine project and the associated impacts. Clearly, the extraction of coal from the Pittsburgh seam was not the ultimate purpose of this project, because piles of coal by themselves are of little value. The ultimate purpose of the Foundation Mine was to produce coal that primarily would be sold to electric utility companies for use in generating electric power in the United States and elsewhere. Yet the PADEP mine application, which emphasizes benefits over costs, fails to require applicants to address in any way the effects that shipping and then burning this coal would have on the regional and global environment and on public health and welfare.

The projected production of about 6.5 million tons of coal annually at Foundation Mine equates to about 130 million tons over 20 years. Burning that amount of Pittsburgh seam coal would result in the emission of about 370 million tons of carbon dioxide (Citizens for Pennsylvania's Future 2012). The burning of coal results in numerous air quality emissions that have serious consequences, such as particulate matter (that causes and exacerbates respiratory illness), mercury and other toxic metals (that cause or contribute to a variety of adverse human ailments), sulfur dioxide (that causes acid precipitation), and carbon dioxide and nitrous oxide (that are responsible for man-made climate change). The air quality degradation associated with the extraction and use of the coal from Foundation Mine would endanger both public health and public welfare. The emission of 370 million tons of carbon dioxide would exacerbate the climate change/global warming effects already being experienced worldwide as a result of the burning of fossil fuels. In evaluating the impacts of any proposed new mine, the regulatory agency must take into account the many serious detriments of burning the coal produced (including air contaminant emissions and climate change).

A serious evaluation of the *need* for the proposed Foundation Mine also was not conducted by the CDMO, taking into consideration the weakened demand for coal domestically and internationally in light of less costly alternative fuel sources and heightened concerns about the global climate effects of burning fossil fuels.[41] The parent company of the applicant itself has announced cutbacks at its other mines[42]. Recent news reports indicate the economic problems Alpha Natural Resources has been facing with its coal operations: "*Alpha Natural Resources ("ANR")'s stock price had lost about 97% of its value falling from a peak of $108.73 in June 2008 to $3.88 on Friday May 30, 2014*" and "*Alpha Natural Resources reported over $1 billion in losses for 2013 and a net loss of over $55 million for 2014 Q1*"[43].

SUMMARY AND CONCLUSIONS

The 2010 Foundation Mine application clearly was incomplete, deficient, and internally inconsistent in the information and assessments it provided. The CDMO review, lasting 3 full years, likewise was incomplete, inadequate, and unsuitable for making a determination that the proposed project would not have significant adverse impacts on the human and natural resources of the project site. If resubmitted at some future date, the Foundation Mine application should not be approved unless and until major changes are made in the project design, in the resource inventory information developed, and in the demonstrations and justifications offered.

As proposed in the 2010 application, the Foundation Mine surface facilities entailed significant impacts to more than 13,400 linear feet of Special Protection waters, and variances would have been required for work in or within 100 feet of more than 24,000 linear feet of streams. The CDMO failed to require that those impacts be adequately minimized, justified as necessary and unavoidable, or mitigated. Indeed, the CDMO allowed them to be dramatically under-reported. Most of those impacts were not proposed to be mitigated inasmuch as they were deemed to be "temporary" (lasting "only" the proposed 20-year period of the mine; no consideration was given to the likely continuing impacts if the mine was expanded and operated for additional decades, like other large longwall mines have been in Pennsylvania). Impacts to four sections of streams were predicted to experience significant pooling, but no streams were specifically predicted to lose flow as a result of the proposed longwall mining. As many as 28 wetlands not delineated for the State application were identified within the surface facilities area examined by the Corps of Engineers. Potentially more than

[41] "The coal lobby's fight for survival, 27 June 2013, By C. Davenport, National Journal. http://www.nationaljournal.com/magazine/the-coal-lobby-s-fight-for-survival-20130627

[42] "Alpha announces restructuring, layoffs", September 18, 2012, By Ken Ward Jr., West Virginia Gazette http://www.wvgazette.com/News/201209180030

[43] "Geology's war on coal", 3 June 2014. http://climatecrocks.com/2014/06/03/geologys-war-on-coal/

175 additional wetlands exist above the balance of the proposed underground mine area but have not yet been delineated by the applicant or reviewed by any agency.

Because the CDMO failed to ensure that the 2010 application include all major activities crucial to the operation of the proposed Foundation Mine, there were additional significant impacts that could not be identified or evaluated by State reviewers. The application failed to acknowledge the full probable extent of impacts to streams, wetlands, and groundwater associated with the proposed mine. The application failed to adequately or accurately predict potential impacts to structures, water resources, or the hydrologic balance based on modern-day longwall mining methods and on experience gained from similar mining nearby. The application failed to adequately characterize the Special Protection nature of the watersheds in which mining activities were proposed, to justify the direct impacts proposed to many miles of Special Protection waters from surface facilities, and to acknowledge the potentially permanent damage to many additional miles of Special Protection waters as a result of intentional subsidence.

The many deficiencies and issues identified in this report must be remedied and adequately addressed if any application is resubmitted for underground coal mining in the area of the proposed Foundation Mine. They must also be addressed in any other applications for new or expanded longwall mining in Pennsylvania.

AUTHORSHIP AND ACKNOWLEDGMENTS

This report was prepared by Stephen P. Kunz with the assistance of James A. Schmid. Both are senior ecologists with Schmid & Company, Inc. Mr. Kunz has been a consulting ecologist since receiving a degree in human ecology from Rutgers University in 1977. Dr. Schmid is a biogeographer with more than 40 years of experience in ecological consulting. Both Mr. Kunz and Dr. Schmid are certified as *Senior Ecologists* by the Ecological Society of America and as *Professional Wetland Scientists* by the Society of Wetland Scientists.

Mr. Kunz and Dr. Schmid offer outstanding credentials as experts in ecology, wetlands, environmental regulation, and impact assessment. They have analyzed the environmental impacts of many kinds of proposed development activities in many states, including coal mining facilities, industrial facilities, transportation facilities, commercial developments, and residential developments. They have written Environmental Impact Statements under contract to the US Environmental Protection Agency, Army Corps of Engineers, Interstate Commerce Commission, various agencies of State and local governments, and a diverse array of private sector entities. They have prepared comprehensive analyses of environmental regulations of nationwide scope. They have investigated the impacts of coal mining for USEPA

in several regions of the United States. They have prepared several reports on underground coal mining in Pennsylvania at the request of organizations such as Citizens Coal Council, Citizens for Pennsylvania's Future, Center for Coalfield Justice, University of Pittsburgh Environmental Law Clinic, Robert C. Byrd National Technology Transfer Center at Wheeling Jesuit University, Mountain Watershed Association, Buffalo Creek Watershed Association, Sierra Club, Raymond Proffitt Foundation, and Pennsylvania Department of Environmental Protection.

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CITIZENS COAL COUNCIL

APPENDICES

APPENDIX A: MODULE-BY-MODULE ANALYSIS OF FOUNDATION MINE APPLICATION

This Appendix reviews each of the Modules submitted to the CDMO in the 2010 underground mine application for the Foundation Mine. Specific deficiencies and inconsistencies in the information provided by the applicant are pointed out. Also identified are deficiencies inherent in the permit application Modules themselves, deficiencies which the CDMO should seek to correct.

There currently are 32 Modules associated with a Pennsylvania application for an underground coal mine permit. Each Module addreses a separate issue, but not every Module necessarily is relevant to every mine application. Individual Modules periodically are revised by the PADEP to reflect changes in the mining law, regulations, and technical guidance. The 2010 application for the proposed new longwall mine known as Foundation Mine included 23 Modules. This section of the report provides an analysis of each Module submitted with the application[1] and also briefly discusses those relevant Modules which were not submitted. Recommendations for what should be done if this application ever is resubmitted are provided in sections beginning with a checkbox ☑ symbol.

MODULE 1 - Application

(A) The September 2008 version of Module 1 was used for the Foundation Mine application. It is notable, however, that most of the other modules used for this application were not the September 2008 (or newer) versions, but the April 2001 versions that were obsolete as of 2010 (see Module 2, below). At the time this application was made, the September 2008 revision of Module 1 had been replaced by the April 2009[2] revision, which should have been used.

☑ **A current Module 1 must be completed.**

(B) A fundamental problem with this Foundation Mine application is illustrated in Module 1 --- the applicant noted (in Section B) that the surface activities proposed for the mine (which included the preparation plant, slope, and shaft facilities) encompassed only 642 acres. In fact, according to the pending Corps of Engineers

[1] The files reviewed for this report were obtained through two formal requests for all information related to the proposed Foundation Mine. The requests were made pursuant to the Pennsylvania Right-to-Know Law, Act 3 of 2008, on 12 September 2011 and 10 January 2013.

[2] All of the modules were reissued in February 2012. A comprehensive comparison and analysis of the various versions of the modules for an underground coal mine was outside the scope of this report.

404 application for this same Foundation Mine, the essential surface activities associated with the proposed operation occupy three times as much land (1,867 acres), some of it outside the proposed mine permit area entirely. Two major facilities missing from this State mine application were a major dam[3] for a 650 million-gallon water impoundment needed for the proposed coal processing and areas for coal refuse disposal. The mine could not function without these additional facilities.

In previous versions of Module 1 (*e.g.*, May 2000, April 2001, and March 2003) the "Application Fee" (Section E) contained a line for "dams"; by 2008, that line had been deleted. This would seem to suggest that it now may be the intent of the CDMO to allow applications for mine-related dams to be submitted separately from other activities associated with a new coal mine operation. It is unfortunate if that is the case, inasmuch as it makes the State increasingly complicit in piecemealing the various aspects of a mine project, making it ever more difficult to evaluate total and cumulative impacts and to coordinate effectively with federal permit review.

☑ All activities essential to the operation of this mine (such as a major water impoundment, water pipeline, in-stream water intake, rail sidings, and coal refuse disposal areas) must be included and addressed in a single application.

(C) The total acreage of surface activity sites associated with the proposed Foundation Mine was lumped together (642 acres), rather than "listed individually" as specifically directed on the Module 1 application form. Individual entries for coal preparation areas, refuse disposal areas, refuse reprocessing areas, and support areas were left blank. Absent such information in an application, it is unclear what specific activities are being proposed (or not) and how extensive each one is.

☑ The proposed acreage of each surface activity necessary to support a functional mine must be listed individually.

(D) Section D of this Module is entitled "Permit Coordination" (see box below). Yet, the only "coordination" mentioned in this section of Module 1 involves underground fuel storage tanks. As discussed in Section A in the main part of this report, interagency and intra-agency coordination of underground coal mine applications is sorely lacking.

☑ This Module should be revised to require a complete listing of all other permits and approvals needed for activities associated with a proposed underground bituminous coal mine.

[3] During July 2012 (2 years following submission of the original application) a revision of the Foundation Mine application was submitted to the CDMO. That "revision" (which addressed a major water impoundment facility but no coal refuse disposal) was not logged in by the CDMO, nor was it given any administrative or technical review. Instead it was put aside, and its review was not planned to begin until after the mine permit had been issued, at which time CDMO planned to review it as "Revision 1".

SECTION D. PERMIT COORDINATION		
Will underground tanks for storage of fuel or chemicals be located within the proposed permit area? (if Yes, please complete Module 10.8)	Yes ☐	No ☒
SECTION E. APPLICATION FEE		
Application Fee (make check payable to "Commonwealth of Pennsylvania")		

Section D in Module 1 would seem to be misnamed, inasmuch as it lacks any real coordination with other permits or approvals required for activities associated with an underground mine application like this one for Foundation Mine.

(E) Another conceptual problem that is illustrated in Module 1 was found in Section G (Land Use Information) of the Foundation Mine application. The proposed Foundation Mine potentially would affect three municipalities (parts of two by direct undermining; part of the third [Richhill Township] is partially within the 1,000-foot buffer area). Yet Center Township was the only municipality that the applicant asked to submit an approval letter with respect to the project's consistency with local land use planning. The Public Notice for this application (see Module 2 below) clearly stated that the underground mine project area would affect lands in Center, Jackson, and Richhill Townships. Module 5 (Section 5.6) noted that surface and/or underground activities for this mine would involve all three municipalities. The proposed longwall mining subsidence could impact all three municipalities directly in the form of drained or pooled streams, damaged buildings, and lost water supplies; the Foundation Mine also could cause indirect impacts that include (and in some cases already have included) relocation of residents and businesses, loss of community structure, and changes in tax base.

☑ Officials in all affected municipalities must be informed of the proposed mine and made aware of the potential impacts and land use changes that are likely to occur in each community.

(F) In Section H, the applicant acknowledged that the proposed operation was within an Environmental Justice Area. Accordingly, a plan for enhanced public participation was supposed to have been provided. No such plan, however, was included in the files made available for this review under the Right-to-Know Law (RTKL) requests. Also, as noted immediately above, full notice and disclosure was not provided to all affected municipalities. An Environmental Justice meeting had been held on 21 October 2008 in conjunction with a previous application for Foundation Mine, but that application subsequently was withdrawn. No Environmental Justice meeting was held on this new application during the three years it was under review following submittal during July 2010.

☑ A plan for enhanced public participation must be submitted, and an Environmental Justice meeting must be scheduled and held that involves residents in all potentially affected municipalities within the mine project area.

MODULE 2 - General Information

(A) The obsolete January 2006 revision of Module 2 was used for this application, rather than the February 2009 version which was the most current one available when the application was submitted in July 2010.

☑ A current Module 2 must be completed and submitted.

(B) The Public Notice included as part of Module 2 states that the underground mine project area will affect lands in Center, Jackson, and Richhill Townships. This is consistent with the information provided in Module 5, but it is inconsistent with Module 1 (see above), which identifies only Center Township.

☑ The discrepancies regarding which Townships are to be affected by this project and which ones are required to review the project's consistency with their local land use plans must be corrected.

(C) Module 2 includes a checklist of all modules included in an application. The 2006 version of Module 2 used for the Foundation Mine application lists only 31 possible Modules; it omits Module 32 (Stability of On-site Materials) which was listed on the 2008 version of Module 2 and which is applicable to this project but was not submitted (and was not pointed out by the CDMO in its administrative completeness review letter).

All 23 of the Modules used in this Foundation Mine application were obsolete at the time it was submitted in July 2010. In September 2008 (almost 2 years before this application was submitted), all of the Modules for an underground mine application had been revised by PADEP, and many of the Modules had been updated one or more times since then but before this application was submitted. When the current application was submitted during July 2010, there was a total of 32 possible Modules for an underground coal mine application. Almost all of the Modules used for this Foundation Mine application were dated April 2001; a few were dated 2004 or 2006. This 2010 application should have used the September 2008 version of all of the Modules, except for the following which were revised subsequently but still prior to the submittal of this application in July 2010:

Module 1	April 2009
Module 2	Feb. 2009
Module 6	Feb. 2009

Module 7	Oct. 2008	
Module 9	May 2010	
Module 13	Oct. 2008	
Module 18	Feb. 2010	
Module 32	Oct. 2008	Not submitted at all

In 2012 all of the modules associated with an underground coal mine application were revised and reissued. Whenever a new module version is issued, CDMO should put out a comparison with the previous version and notify all pending applicants that the additional substantive information -- if any -- must be provided as a supplement.

The subject Foundation Mine application is the second such application submitted to the CDMO. On 27 February 2008, Foundation Mining LP[4] submitted permit applications (one for slope and shaft facilities, and one for selected surface facilities) for an underground mine project similar to the current one. That application was subsequently revised in June 2008. The September 2008 Modules were not available at that time, and the older versions of the Modules used for that application were current as of that time. That application, however, was officially and formally "returned" on 20 April 2009.

When returning the two separate applications (slope and shaft, and surface facilities) on 20 April 2009, the CDMO suggested that they could be combined in a resubmitted application to reduce coordination and technical review time. (Inasmuch as the applicant was combining some of the proposed project activities for efficiency of review, it is unclear why it did not, or was not required by the CDMO, to incorporate all of the activities necessary to operate a functional longwall mine and thereby eliminate the piecemealing difficulties discussed above.)

Even if the current application were to be viewed as a resubmission or revision of the 2008 application, which is not how it has been portrayed or presented, the latest set of application forms and Modules available at the time of resubmission should have been used. There is no indication anywhere in the current application that it is meant to be a resubmission or revision of the 2008 application (indeed, it is consistently listed and referred to as being a "new permit" application). Accordingly, all of the versions of Modules current as of mid-2010 should have been used for this application.

In a few selective instances, the CDMO specifically requested that the applicant provide a more-updated Module or form.

[4] A corporate entity different than the current applicant, Foundation Mining LLC.

Form 12.1A (the CDMO recommended this newer form be used even though it also said it is "*not required for this application*"; it is unclear why the information in this updated form would not be required for rational agency decisionmaking.)

Form 15A (the CDMO noted that Module 15 was recently revised to include this form, but advised applicant that it was "*unnecessary*" to revise all of Module 15, only to complete this form.) Given that the newer 2008 version of Module 15 incorporates the substantive revisions of the Technical Guidance Document (563-2000-655) for stream protection that became fully effective in 2007, it is astonishing that the CDMO would believe that the information in the updated version was unnecessary. Consequently, that information remained lacking from the 2010 application.

Module 19 (the CDMO directed the applicant to use the new Module 19 forms in order to include Sections 19.5 and 19.6 of Module 19).

The newer Modules in many cases reflect the latest regulatory guidance for specific requirements and how to comply with them. For example, the requirements of TGD 563-2000-655 (adopted October 2005 and fully in force as of October 2007) are reflected in the September 2008 revisions of Module 8 (Hydrology/Baseline Biology) and Module 15 (Streams/Wetlands), yet the Foundation Mine application uses the obsolete April 2001 version of Module 8 and the obsolete January 2006 version of Module 15. By failing to require use of the latest versions, the CDMO apparently saw no problem with the fact that extensive "required" information was missing.

Even assuming that the same kinds of information were solicited under the different versions of the Modules (which they are not), use of the latest, most current Modules doubtless would make the CDMO's review process easier and more efficient, especially in large underground coal mines such as this one when numerous years had elapsed since the original submission of the previous application.

☑ **The information specified in the most current version of each of the Modules relevant to this underground mine application must be submitted. At minimum, the applicant must be required to supplement this application with all the information required in the most current Modules, and then prepare a cross-index of that information vis-à-vis the new forms.**

MODULE 3 - Ownership/Compliance Information

(A) The obsolete April 2001 version of Module 3 was used instead of the September 2008 version which was current at the time of application.

☑ **A current Module 3 must be completed and submitted.**

(B) Although the applicant noted that Foundation Mining, LLC (an entity created specifically for this proposed new mine) had not had any violations during the previous three years, Attachment 3.6 provided the previous 3-year violation history for all other affiliates of its parent company Alpha Natural Resources, including the operators of nearby Cumberland Mine and Emerald Mine (both longwall operations) and the Amfire Mining Company. That 3-year violation history encompassed 151 pages, and included operations in multiple states. A total of 21 violations was listed for the three Pennsylvania Alpha Natural Resources mines, with fines totaling $32,770.50. Although all of those violations reportedly had been resolved, the extensive list is a reflection on the business integrity of this company, and it portends that future violations at Foundation Mine are likely, given the infrequency with which PADEP issues violations and the minimal financial penalties associated with them.

MODULE 4 - Areas Where Mining is Prohibited or Restricted

(A) The obsolete April 2001 version of Module 4 was used instead of the September 2008 version which was current at the time this application was submitted.

☑ A current Module 4 must be completed and submitted.

(B) According to correspondence attached to this section of the application, the Pennsylvania Historic and Museum Commission (PHMC) originally recommended denial of this permit due to a high probability of significant cultural resources and potential impacts to them. Upon further investigation and clarification provided by the applicant, that agency concluded that there would be no impacts from proposed surface facilities or underground mining. However, this application focused only on the 642-acre surface activities proposed in Center Township, which again raises the larger question about the actual extent of probable surface impacts, including to historic and archaeological resources. According to the Corps 404 application there was three times as much surface area proposed to be disturbed as under the application reviewed by the CDMO, and those additional areas in both Center and Jackson Townships had not been reviewed or "cleared" by PHMC (at least according to the CDMO files).

There may be an outstanding concern with potential impacts to the Holbrook Christian Church, which the applicant's consultant had claimed was not eligible for inclusion on the National Register of Historic Places. Just days prior to filing of this application, PHMC determined (25 May 2010) that the Church "is eligible", and that the effects of this project on it need to be evaluated. In Section 6.2.e.20, the Church's eligibility was acknowledged by the applicant, but no impacts had been evaluated.

☑ The effects on the National Register-eligible Holbrook Christian Church need to be evaluated, and that determination must be considered before any final decision is made by the CDMO.

Because of restrictions on what can be done in "Special Protection" waters, Section 4.5 of Module 4 directs applicants to Module 24 **if direct discharges** are proposed to High Quality waters, and to Module 15 **if surface disturbances** are proposed within 100 feet of any intermittent or perennial stream. There is no mention of Exceptional Value waters; that omission should be corrected. In addition to those two potential impacts, Special Protection waters also can be damaged by the **subsidence** associated with longwall mining. Thus, Module 4 also should be revised to require applicants to fully document all Special Protection streams (EV and HQ) and to clearly identify those that are at risk of damage from longwall subsidence.

(C) Longwall mining for Foundation Mine was acknowledged to be proposed beneath State Game Lands (SGL) #179. According to the following excerpt from Section 4.6, no significant impacts were anticipated:

> *Typically, the surface over a longwall panel will subside with a gentle, trough-like depression. The majority of this settlement occurs during the first few weeks of mining. Based on results of past monitoring, the maximum vertical displacement ranges from 3 to 4 feet. Surface lands damaged by subsidence will be repaired to maintain the value and reasonably foreseeable use.*

This benign view of what may occur as a result of longwall mining is at odds with the historical experience reported in the three Act 54 Five-Year review reports completed to date, especially as longwall panels have gotten progressively larger and wider in Pennsylvania. The largest single wetland in the underground mine permit area is located in SGL #179 (see **Figures 6a** and **6b**), but it was not acknowledged or delineated (see Module 15, below). No explanation about how "surface lands damaged" by longwall mining (including streams and wetlands in SGL #179) will be "repaired" was provided.

☑ **Additional documentation must be provided to support the position that undermining of SGL #179 will not result in unacceptable adverse impacts to wetlands and other public resources there.**

MODULE 5 - Property Interests

(A) The obsolete April 2001 version of Module 5 was used instead of the September 2008 version which was current at the time of application.

☑ **A current Module 5 must be completed and submitted.**

(B) The applicant's response in Section 5.3 suggested that there would be no future expansions of this mine. It stated: ***No individual mining permits are anticipated***

for any contiguous coal tracts or surface lands in the future. This statement was inconsistent with certain application drawings which showed longwall panels extending well beyond the "proposed" underground permit boundary (see **Figure 4**), and/or identified time periods beyond the proposed 20 years (e.g., drawings in Module 22 [22.4-3-10, Panel 29-2-1] showed areas to be mined in "Years 21-25"). It also contradicted information provided in a recent Commonwealth Court case[5], which noted that:

> Foundation Coal is the owner of massive coal reserves in Greene County ..... covering approximately 45,000 acres. ..... Foundation Coal estimates that its coal mining operations at the Foundation Mine will continue for about 40 years once actual coal extraction has begun.

☑ The applicant must be required to identify clearly the maximum potential extent of all areas of current and anticipated mining and to evaluate all associated impacts.

(C) The response in Section 5.6 that proposed surface or underground activities would occur in areas where Center, Jackson, and Richhill Townships all have jurisdiction was correct, but it was inconsistent with the response in Module 1, where only Center Township was asked to submit an approval letter with respect to this project's consistency with local land use planning.

☑ As noted above, Module 1 must be corrected to resolve this inconsistency.

MODULE 6 - Environmental Resource Maps

(A) The obsolete April 2001 version of Module 6 was used instead of the February 2009 version which was current at the time of application.

☑ A current Module 6 must be completed and submitted.

(B) The applicant's original Exhibit 6.1 identified 32 proposed NPDES wastewater discharge locations within the 642-acre surface facilities area. The CDMO (in an August 2010 comment on Module 12) advised the applicant that a large number of discharge points could be removed from the application because NPDES approval is not required in Pennsylvania for outfalls handling less than 5 acres of stormwater drainage. Consequently, on the revised Exhibit 6.1, only 7 NPDES discharge locations were shown by the applicant. (Module 24 listed 9 NPDES discharges.) Two of the discharges (Outfalls 003 and 006) were on Hoge Run just downstream from the confluence of EV tributaries. No NPDES discharge was identified for

[5] Foundation Coal Resources Corporation, Pennsylvania Land Holdings Corporation, and Realty Company of Pennsylvania, Petitioners vs. Department of Environmental Protection and Penneco Oil Company, Inc., Respondents. No. 619 C.D. 2009. Argued 14 October 2009.

sanitary wastewater associated with the proposed bathhouse. Exhibit 6.1 identified no EV streams and made no distinction between Special Protection waters and other waters. There was no mention in the text responses for this module that there are EV waters on or near the site.

☑ The number and locations of all required NPDES discharges must be consistently reported in the application. All EV (and other Special Protection) waters on and near the site must be identified as such on Exhibits 6.1 and 6.3.

(C) Section 6.2 response noted that there were no State Game Lands, State Forests, State Parks, State Wilderness Lands, or public parks within, or within 1,000 feet of, the permit area for *surface* activities. For Section 6.3(24), which asks the same thing regarding the underground mine area, the response was less direct --- instead of clearly stating that SGL #179 was located above the underground mine area, it simply made reference to Exhibit 6.3.

☑ It must be stated clearly that sections of State Game Lands #179 are within, and that additional sections of SGL #179 are within 1,000 feet of, the permit area for the proposed underground coal mine.

(D) Among other things, Exhibit 6.3 is supposed to identify all wetlands above the underground mine permit area, and within 1,000 feet of the permit area boundary. The Corps of Engineers conducted a formal Jurisdictional Determination (JD) of the 1,867-acre surface activities area proposed for Foundation Mine as part of the 2012 federal 404 application, and as a result identified many wetlands that had not been delineated in those same areas in the application submitted to the CDMO (see Section B1 in main report). The density of wetlands now known to exist (following Corps review) within surface facility areas is much greater than the density of wetlands delineated by the applicant outside of surface activity areas but above proposed longwall-mined areas (which have been reviewed by no agency yet). In the areas above the underground mine permit area we have identified numerous additional wetlands not identified in either the State or Corps application (see Module 15, below), and it is probable that many dozens more wetlands have been omitted (also see Section B2 in main report).

☑ All wetlands above the underground mine area must be field-delineated and must be reviewed and confirmed by the Corps in a JD, and all wetlands must be identified and documented on all of the relevant Exhibits.

MODULE 7 - Geology

(A) The obsolete April 2001 version of Module 7 was used instead of the October 2008 version which was current at the time of application.

☑ **A current Module 7 must be completed and submitted.**

(B) The applicant noted that the overburden above the Pittsburgh Coal seam varies in thickness within the proposed permit area from approximately 620 to 1,360 feet.

☑ **With Foundation Mine panels proposed to be as much as 1,600 feet wide, all the longwall mine panels will be "supercritical" according to the 3rd Act 54 Five-Year Review discussion, and so maximum possible subsidence can be expected throughout the permit area. This situation needs to be acknowledged and measures should be put in place to avoid or minimize subsidence damage.**

MODULE 8 - Hydrology

(A) The obsolete April 2001 version of this Module was used, even though the version revised September 2008 (almost twice the length) was current at the time of this application. The practical importance of this failure by the CDMO to require use of the latest Module 8 is that the current TGD 563-2000-655 requirements which were adopted in 2005 (for pre-mining inventory and assessment of streams, wetlands, groundwater, and other hydrologic information) are reflected in the 2008 version of Module 8, but not in the 2001 version used in this Foundation Mine application. The 2008 version of Module 8 requires additional data regarding the biology and structure of streams (Forms 8.8B, 8.8C, 8.8D, 8.10A, 8.11A, and 8.13C) and the nature and functions of wetlands (Form 8.12A) that were not provided in the 2010 application for Foundation Mine.

☑ **A current Module 8, and all of the associated forms and documentation, must be completed and submitted by the applicant and reviewed by the CDMO.**

(B) The applicant's hydrologic discussion in Section 8.1 made numerous references to a report entitled "Water Resources and the Effects of Coal Mining, Greene County, Pennsylvania"[6] which was published more than 25 years ago. While that reference may be relevant for the general geology and subsurface hydrology of the mine permit area, it is very much outdated in terms of the quality of groundwater and the effects of coal mining on surface waters in Greene County (which were the principal subjects of that publication). At the time of its publication, the relatively few longwall mine panels were significantly smaller in size than those proposed for the Foundation Mine, and most mining in Greene County was occurring or had occurred to the *east* of Waynesburg. Indeed, Enlow Fork of Wheeling Creek was used in that publication as an unmined reference stream; subsequently, it has been documented to be impacted significantly by longwall mining (USEPA 2000, USFWS 2004).

[6] Stoner, J.D.; D.R. Williams; T.F. Buckwalter; J.K. Felbinger; and K.L. Pattison. 1987. Water Resource Report 63, Pennsylvania Bureau of Topographic and Geologic Survey. 166 p. plus 2 plates.

Section 8.1(g) in this Module asks the applicant to address impacts of past mining on the quality and quantity of local water resources. The response given was that there has been no past mining in this area, which was correct (and a major reason why this new mine in High Quality and Exceptional Value watersheds should receive detailed scrutiny).

The applicant then suggested that the past experience at nearby Cumberland Mine (also owned by Alpha Natural Resources) was what could be expected at the proposed Foundation Mine. It stated that "*few residents*" above the Cumberland Mine "*have experienced loss of water as a result of mining activities*". That statement was misleading at best. In fact, according to the third Act 54 Five-Year Report (University of Pittsburgh 2011), 30 water supplies were impacted by Cumberland Mine during the period 2003-2008, which represents nearly 20% of all water supplies undermined by that operation. Indeed, Cumberland Mine had the 4th highest number of impacted water supplies of the eight Pennsylvania longwall mines active during that 5-year period.

Furthermore, the longwall panels at Cumberland Mine were significantly smaller on average than those proposed at Foundation Mine.[7] Also, that only "*few residents*" have experienced water loss may not be indicative of water losses in total. The actual number reported appears to have been discounted by omitting residents who either were bought-out by the mine operator or who made some sort of confidential settlement agreement with the operator. None of that bodes well for protecting or preserving water supplies above the proposed Foundation Mine.

☑ The response in this section must fully address the impacts of past mining on the quality and quantity of nearby water resources.

(C) Section 8.1(h) in this Module likewise asks the applicant to "document the nature of water problems or peculiar conditions". Again, the response was perhaps overly optimistic: "*no water problems or peculiar conditions are associated with*" Cumberland Mine, and so none was expected at Foundation Mine. Indeed? Although the applicant may not have expected problems, if the proportion of damages were comparable, one could expect that 39 water supplies would be lost due to proposed Foundation Mine operations during the five years of its initial approval. For those surface owners who then must wait years for resolution after experiencing water loss, this hardly constitutes "no water problems".

☑ The response in this section must fully address the impacts and implications of past mining on the quality and quantity of local water resources.

[7] The longwall panels proposed for Foundation Mine were proposed to average 1,500 feet in width [see Module 10] which is 16% wider than the 1,295-foot average width at Cumberland Mine, and so the impacts that may have occurred there would not necessarily be comparable to what would occur at this new mine. Furthermore, the proposed panels (up to 1,600' wide and 16,100' long) were 56% longer and 47% wider than the industry "average" reported in the February 2012 issue of the publication "Coal Age".

(D) The existence, location, and significance of Special Protection waters, and especially of Exceptional Value (EV) waters, were not discussed by the applicant in this Module where they logically should have been discussed. There was not a single mention of EV waters in the applicant's discussions of hydrology and surface water resources. The Stream Inventory list on Form 8.3B identified all streams in the permit area as having uses of either HQ-WWF or TSF. None of the streams was identified as EV, although to date at least 21 separate segments of the streams on the applicant's list actually have been determined by PADEP to have EV existing uses.

☑ All waters which have either a designated use or an existing use of EV or HQ must be clearly identified as such, and proposed measures to protect these Special Protection waters must be identified.

(E) In the more than 290 pages of background monitoring (Form 8.4A) submitted for this Foundation Mine application, most of the data were collected during the 2006-2007 time period, with some collected 2008-2009, fewer collected during 2004, and even fewer collected during 2010. The current version of Module 8 requires monthly streamflow monitoring over a 24-month period, but of the 87 streams monitored, only 37% included 24 or more monthly records, and in most cases they were not consecutive (*e.g.*, there may have been 26 monthly samples recorded over a 37-month period). Likewise, for springs and wells, background samples were collected only once or twice in 84% of the cases, often in the same season and sometimes in the same month (see discussion in Section D2 of main report). In many instances where a well sample was measured and the various water quality parameters were recorded, no static water elevation was recorded and no measurement of flow or yield was made. Without a complete baseline record of streamflow, springflow, well water levels, and specific capacity/yield over a long enough period that includes seasonal as well as annual variation, there is inadequate basis to determine the occurrence or magnitude of hydrologic changes due to mining and to determine the success of any needed restoration following damage.

☑ All monitoring points must include the appropriate number of records.

(F) Although requested in Section 8.4, no Form 8.4B (Specific Capacity - pumping test) data were provided in the 2010 Foundation Mine application. As a result, the quantity of water in all of the wells at risk and their yields were not determined. (Form 8.4A only records the static well level on the day of monitoring which, by itself, conveys little information.) If the quantity of water in a well is adversely impacted by undermining, there would be no way to determine the extent of the impact and no way to assess whether adequate restoration was provided post-mining (see also Section D2 in main report).

☑ The specific capacity/yield of all potentially affected wells must be determined and recorded using Form 8.4B, as part of the permit application.

(G) Section 8.5a.4.v in Module 8 asks about potential flow reduction in streams above the mine area. The response given was that no significant impacts to surface flow regimes were anticipated, inasmuch as Cumberland Mine did not adversely affect stream quantities. That statement was false. In fact, the third Act 54 Five-Year Report documented 5 instances of flow loss and 2 instances of unanticipated pooling at Cumberland Mine during its 5-year review period. Emerald Mine, another nearby longwall operation owned by Alpha Natural Resources, reported 6 instances of flow loss, five of which had not been "resolved" by the end of the third Act 54 review period. If Cumberland Mine, with its smaller longwall panels, provides any indication as to probable impacts claimed by the applicant for Foundation Mine, there would be at least 5 unanticipated instances of stream flow loss and 2 instances of unanticipated stream pooling during the five years of its initial permit approval. The applicant provided no basis for drawing any conclusion that damages from Foundation Mine's larger panels might be less than those experienced at its nearby longwall mines; its larger panels portend greater impacts on streams.

☑ The applicant must fully and accurately address the potential for flow reduction or loss in streams.

The obsolete Module 8 application form was poorly worded and likely contributed to this applicant's omission of pump test information. After mentioning *Form 8.4B* at the start of Section 8.4, the Module then focuses only on the information to be provided on *Form 8.4A*, namely water quality parameters. In the Section 8.4(b) listing of required data to be provided, only two sets of parameters are listed and both relate to water quality. It would be appropriate for the CDMO to revise the current version of this Module and add an additional set of required data parameters: for well yields and for specific capacity.

(H) Section 8.5a.4.vi in Module 8 asks about potential alteration of the hydrology of dams, ponds, impoundments, and wetlands. The applicant's response, that at least 620 feet of vertical separation should preclude any adverse effects on these resources, was not substantiated. Where surface subsidence is likely (as it was because the longwall panels were expected to be more than twice as wide as the depth of the mining beneath the surface, or "supercritical"[8]), it is virtually certain to adversely affect the hydrology of wetlands and other water resources. This applicant provided no evidence to the contrary.

[8] When the width of a longwall panel exceeds the depth of mining, it is said to be "supercritical", meaning that its maximum subsidence potential will be reached and that surface effects are likely (University of Pittsburgh 2011).

☑ The applicant must fully and accurately address the potential for hydrologic impacts to wetlands, dams, ponds, and impoundments based on past experience.

(I) In Section 8.5a.5 the statement was made: *Based upon the depths of wells, geologic conditions, and overburden thicknesses, it is anticipated that the future effects of mining will be similar to the effects that past mining at the adjacent Cumberland Mine had upon local ground water supplies (in terms of quantity and quality).* In light of the impacts documented from the narrower longwall panels at Cumberland Mine, this argument is not acceptable, because it suggests that extensive damage is, indeed, to be expected at Foundation Mine, and that those damages will only slowly, if ever, be resolved. Likewise the applicant mentioned "*the unlikely event* [of] *water supply loss*", again in direct contrast to the fact, as noted above, that water loss was experienced in nearly 20% of the water supplies above active Cumberland Mine workings between 2003 and 2008.

☑ The applicant must fully and accurately address the potential for impacts to well water quality and quantity for the proposed Foundation Mine.

(J) In Section 8.5b.2.iii, the applicant is asked to address the potential for "contamination of adjacent water supplies" due to proposed coal preparation activities. The answer did not address the question, stating that such "*contamination…. is unlikely since the applicant owns the majority of the* …" adjacent water supplies. Just because some of the adjacent water supplies may be owned by the applicant does not mean they cannot or will not be contaminated, with potentially disastrous consequences for long-term land use and future generations after the coal resource has been exhausted.

☑ The applicant must fully and accurately address the potential for contamination of adjacent water supplies (regardless of who owns them) and how it plans to identify and remediate any contamination that does occur.

(K) In Section 8.5b.2.iv, the applicant is asked to demonstrate that any proposed replacement water supplies will meet the needs of the current user. The response given was that temporary water would be provided until a permanent replacement was developed, an arrangement that is characterized as "*satisfactory*" at Cumberland Mine.

First, that response begs the question: "satisfactory" for whom? No evidence was provided that the arrangements provided for affected landowners at Cumberland Mine or elsewhere were judged to be "satisfactory" by those landowners or by the CDMO. Indeed, water supply damages at Cumberland Mine were numerous and some remained "unresolved" per the third Act 54 report.

Second, and more important, that response did not provide the "demonstration" requested in this Section. Since the applicant performed no pumping tests to identify

the premining yields of the water wells at risk (see Section F in main report), it had no basis to demonstrate that any proposed replacement ever could or would meet the foreseeable future needs of any current user, much less of future generations of Pennsylvanians.

☑ The applicant must demonstrate that proposed water supply replacements will meet existing supplies in quantity and quality, and also must commit to provide satisfactory immediate and permanent repair or replacement of any affected water supplies.

(L) In Section 8.5c the applicant is asked about water resource concerns relating to coal refuse disposal activities. The response given was that such activities are not part of this application. While that was true, coal refuse disposal is necessary for the proposed mine to function, and indeed, onsite coal refuse disposal activities were proposed for the Foundation Mine in the Corps 404 application. By not including coal refuse disposal in the 2010 State application, the applicant intentionally piecemealed this mine project, ignoring the potential water resource concerns associated with coal refuse disposal activities, and making the overall impacts of the Foundation Mine appear to be smaller than they actually would be.

☑ The applicant must identify all coal refuse disposal activities associated with this mine operation, and identify and evaluate all impacts associated with those and other activities (such as a new water impoundment, new rail sidings), without which this mine cannot function as an economically profitable enterprise.

(M) In Section 8.7, the applicant is requested to provide, among other things, data on well yields using Form 8.4B. The response was "*Well yield data will be gathered and provided prior to the mining encroaching within 1,000 feet of the supply*." Although that minimally complied with the "letter" of the CDMO requirements in this Module, it likely was inadequate to assess the pre-mining yield of the wells because by the time mining is within 1,000 feet of the well, its yield may already be affected by the geologic disruption. The absence of well yield data in a permit application precludes the CDMO from making credible findings in its requisite Cumulative Hydrologic Impact Assessment (CHIA).

☑ The CDMO must require tests of well water quantity, and not just quality, to be made and reported as part of each permit application, and not allow the applicant to wait until after mining has been approved and is approaching to within 1,000 feet of existing wells. Furthermore, the data are needed so that the CDMO can prepare the CHIA to inform its decision on the permit application.

The CDMO is required by law to determine the cumulative hydrologic impacts of a proposed mine on the associated watershed and to make a written finding that the proposed activities have been designed to prevent damage to the hydrologic balance within and outside the permit area. This typically is done by the CDMO preparing a Cumulative Hydrologic Impact Assessment (CHIA) using Form 5600-FM-MR0017 (revised *9/2009*). No such CHIA was prepared for the Foundation Mine.

MODULE 9 – Operations Maps - Surface Mining Activity Sites

(A) The obsolete April 2001 version of Module 9 was used instead of the May 2010 version, which was current at the time of application, or at minimum the September 2008 version.

☑ **A current Module 9 must be completed and submitted.**

(B) The most glaring problem with this section of the Foundation Mine application was that it addressed only about one third of the surface activity sites that it should have --- only 642 acres were addressed, when in fact (according to the Corps 404 application) the surface activity areas would extend across 1,867 acres. The larger area involves significant additional impacts which were not identified on these maps. Some of the proposed surface activities (according to the federal 404 application) are on lands outside the mine permit area entirely.

☑ **This Module response must reflect all of the surface activities required for the Foundation Mine operation, including refuse disposal areas, water impoundments, pipelines, railroad sidings, and other associated facilities.**

MODULE 10 - Operation Plan

(A) The obsolete April 2001 version of Module 10 was used instead of the September 2008 version which was current at the time of application.

☑ **A current Module 10 must be completed and submitted.**

(B) As with Module 9 above, the most glaring problem with this section of the Foundation Mine application was that it addressed only about one-third of the surface activity sites that it should have --- only 642 acres were addressed, when in fact (according to the Corps 404 application) the surface activity areas were proposed to extend across 1,867 acres. The larger area involves significant additional impacts

which were not identified, evaluated, or mitigated. For example, according to the application: "*The treated mine water will either be hauled away or pumped to the future slurry impoundment*". Why was the "slurry impoundment" not included as part of this application when clearly it was known to be needed? It should have been identified and evaluated along with all other essential activities. If the slurry impoundment was not necessary immediately, then the traffic and other impacts associated with the hauling of treated mine water should have been evaluated in detail, and the location and adequacy of any existing or anticipated industrial wastewater treatment facilities proposed for the interim disposal of mine water should have been identified.

In Section 10.1.a.1, the applicant noted that four stream restoration areas were proposed. Each was associated with gate cutting and similar work proposed to be attempted to restore flow in areas predicted to experience pooling of more than 1 foot in depth. Detailed restoration plans should have been provided to address all of the proposed stream impacts, including the many miles of High Quality streams that would be filled and used for industrial activities on the surface of the mine for at least 20 years. It is not clear that sufficient pre-mining baseline data were collected to effectively guide restoration of these "High Quality" streams to their existing uses, and no plans were included in the Foundation Mine application to provide future monitoring to demonstrate successful restoration of pre-mining aquatic biota.

Section 10.1.a.2 states "*The intake and associated waterline providing the make-up water for the preparation plant from South Fork Tenmile Creek will be permitted as a revision to this permit application prior to the construction of the intake and waterline"*. As with coal refuse disposal, these activities should have been included in, and evaluated as part of this application, especially since they were known to be required, they already had been designed, they were included in the 2012 Corps 404 application which cannot be approved prior to approval by PADEP of the requisite CWA Section 401 water quality certificate, and marketable coal cannot be produced in their absence. Likewise, the 650 million-gallon water impoundment needed in conjunction with the coal preparation plant, and for which a "revision" of this mine application was submitted in July 2012 (but which was shelved by the CDMO for agency consideration only after this 2010 mine application had been approved) should have been made a part of the overall Foundation Mine project review. It was improper that this application was allowed by the CDMO to be piecemealed, thereby understating its cumulative impacts.

In Section 10.1.a.3, the applicant stated that coal refuse disposal was not part of this application. However, the Operation Plan noted that coal would be prepared and cleaned before being shipped offsite, which activities necessarily would generate coal refuse. Two large refuse disposal areas had been designed and were specifically included in the 2012 Corps 404 application (and a third was said to be needed as well). Because coal refuse areas would be needed in the operation of the Foundation Mine, they too should have been included in, and evaluated as part of, this application. All potential alternative locations for refuse disposal should have been disclosed to the public.

In Section 10.11, it was stated that sanitary facilities were not included as part of this permit application, yet a bathhouse was proposed as part of the surface facilities. The handling of sanitary waste from the proposed bathhouse, and any associated discharge and NPDES approval, was not addressed. Yet the mine could not lawfully operate without provision for the proper disposal of human wastes.

☑ **The Operation Plan as described in this application was inconsistent, incomplete, and grossly misleading because it excluded necessary activities that would be part of the Foundation Mine operation, and which in fact in some instances already had been designed and had been included in the 2012 Corps 404 application. This Module response should reflect all of the surface activities required for the mine operation, including refuse disposal areas and water impoundments, sanitary waste disposal, and all other associated facilities. Until all activities in wetlands and waters associated with this Foundation Mine project have been reviewed and approved by PADEP, CWA Section 401 water quality certification cannot be granted, and the Corps cannot approve the Section 404 permit. Without the Corps 404 permit, none of the construction activities in federally regulated wetlands or waters can be initiated.**

(C) The estimated life of the coal preparation plant operation (Section 10.1.a.2) originally was listed as 32 years, but was changed to 20 years in the August 2010 revision. Elsewhere in the application were suggestions that the limits of the proposed mine may be expanded in the future. Module 24 incorporated jobs and economic benefits extending beyond a 20-year mining timeframe. As noted above in the discussion of Module 5, during a Commonwealth Court hearing, it was stated that the Foundation Mine would operate for about 40 years after actual coal extraction had begun.

☑ **All proposed and potential future areas of surface and underground operations must be identified and evaluated. The estimated potential operating life of the mine must be consistent with the applicant's mineral holdings.**

MODULE 11 - Erosion and Sedimentation Controls

(A) The obsolete April 2001 version of Module 11 was used instead of the September 2008 version which was current at the time of application.

☑ **A current Module 11 must be completed and submitted.**

(B) There would be seven sedimentation ponds at the Foundation Mine according to this application. Yet there were many additional permanent and temporary sedimentation ponds with discharges to surface waters, as well as numerous

stockpiles, according to the 2012 Corps 404 permit application. Attachment 11.1.e provided plans and cross-sections of existing and proposed conditions along affected streams. Additional streams would be affected according to the Corps 404 permit application, yet there were no plans or cross-sections of existing and proposed conditions along those additional streams.

☑ **This Module must reflect all erosion and sedimentation controls that are known to be needed for all of the surface activities associated with the Foundation Mine operation, including refuse disposal areas, water impoundments, pipeline, railroad sidings, and all ancillary facilities.**

MODULE 12 - Treatment Systems

(A) The obsolete March 2004 version of Module 12 was used instead of the September 2008 version which was current at the time of this 2010 application. Admittedly, there is not a significant difference between the 2004 and the 2008 versions of Module 12. During February 2011, however, major improvements in Module 12 were introduced (notably a separate application form #5600-PM-BMP0032), which elicit extensive appropriate information regarding the quality and uses of receiving waters and proposed effluent characteristics crucial for evaluation of the associated NPDES application. Significant new information will be needed for any new or revised Foundation Mine application.

☑ **A complete and current version of Module 12 must be submitted.**

☑ **This Module should be renamed "Treatment Systems and NPDES Permit Application" to emphasize the expanded focus on NPDES-related information and the goal of the CDMO to combine NPDES permitting with the rest of the coal mine review.**

(B) The July 2010 application for Foundation Mine listed and described 34 sedimentation ponds and associated NPDES discharges. The August 2010 revision identified only seven NPDES outfalls. Module 24 listed nine NPDES discharges. There was at least one additional NPDES outfall not shown in the application (associated with the water impoundment; identified in the Dam Safety application under review in Harrisburg, and in the "shelved" Revision 1 of the subject application submitted to the CDMO during July 2012). There may be additional NPDES outfalls associated with the proposed bathhouse and the needed coal refuse disposal areas, none of which was identified or evaluated as part of this application.

☑ **All NPDES outfalls associated with every aspect of the Foundation Mine project must be identified and evaluated to demonstrate that applicable discharge standards can be met in these Special Protection waters throughout the life of the mine and following its closure.**

(C) All acknowledged NPDES outfalls were proposed to discharge to HQ streams. Three of them would handle water that was proposed to come into contact with coal. Nevertheless, the "Treatment or Other Control Technology Provided" listed for all of the discharges was exactly the same ("sedimentation"). No special control technique or technology was offered to protect the Special Protection receiving streams from wastewater that would contact coal. "Sedimentation" control was not demonstrated to be adequate to maintain the existing HQ uses downstream from those discharges.

☑ When "sedimentation" is proposed as a treatment technique for discharges to Special Protection waters, especially when the water is to have been in contact with coal, the CDMO must confirm that it will adequately protect the existing and designated uses of those streams.

Module 12 was revised in 2011 and now more clearly advises applicants that an NPDES permit "*is needed for all mining permits*". It also directs mining applicants to use a new form (#5600-PM-BMP0032) to apply for coverage under an individual NPDES permit. The older versions of Module 12, including the one used for the 2010 Foundation Mine application, did not elicit the same detailed information about the proposed discharges and the receiving streams. Module 12 should be renamed "Treatment Systems and NPDES Application" to emphasize its expanded focus on NPDES-related information.

(D) Module 13 provided design calculations for 8 sedimentation ponds and 2 water treatment ponds. Yet only 7 sedimentation ponds/outfalls were listed in the October 2010 revision of Module 12, omitting Sediment Pond R1 and Treatment Ponds 1 and 2. Module 24 listed 9 NPDES discharges.

☑ The discrepancies between Modules 12, 13, and 24 (and possibly others) regarding sediment ponds, outfalls, and NPDES discharges must be corrected both for internal consistency and to assure water quality protection.

(E) Treatment pond systems at the Shaft Pad and at the Slope Pad were said to be similar, but the system at the former was said to handle a uniform flow of 50 gpm, while the latter would handle flows of 500 gpm. These numbers were repeated elsewhere, and so are not believed to have been typographic errors.

☑ Treatment and monitoring requirements must be detailed for these flows that are an order of magnitude different in size, and the adequacy of these proposed treatment systems must be re-evaluated.

(F) Section 12.2(a) stated: "*Once the slurry impoundment for refuse disposal is operational mine water may be pumped into slurry impoundment*". Section 12.7 states: "*Sludge will be removed by backhoe or other suitable equipment to a truck and then transported and disposed of at the coal refuse disposal area to be permitted for Foundation Mine."* No refuse disposal areas were included as part of the State's 2010 Foundation Mine application (as they were with the 2012 Corps 404 application).

☑ **Because the proposed Foundation Mine cannot function unless it disposes of its sludge and other refuse, such functions are necessary aspects of the project and must be included in the application and assessed as part of the overall review.**

MODULE 13 - Impoundments

(A) The obsolete 2001 version of Module 13 was used instead of the October 2008 version which was current at the time of application.

☑ **A complete and current Module 13 must be submitted.**

(B) Ten impoundments were identified, all of which were said to have dams less than 20 feet high. Yet not listed or described was the major 650 million-gallon water supply impoundment, with an earthfill dam 183 feet high and 1,130 feet long, that also was known to be a necessary part of this mine operation. That impoundment was included in the Corps 404 application, in a separate PADEP Dam Safety application submitted to the PADEP Bureau of Waterways Engineering in Harrisburg, and in a supplement to the mine application which the CDMO shelved, but the impoundment was not being considered as part of the 2010 mine application or reviewed by the CDMO. Major impoundments in longwall mines pose a risk to human health and safety as well as to water quality. Their damage to onsite stream channels and aquatic biota will be long-term, and possibly permanent.

☑ **All impoundments required for any aspect of the Foundation Mine project must be identified and evaluated in the mine application, even if they are being evaluated by other agencies or offices in separate applications. Unless all aspects of the mine project are assessed together, the overall impacts associated with the project cannot be properly evaluated.**

(C) All of the 10 impoundments identified in this application were claimed to fall below thresholds that would require review and approval of a Chapter 105 permit. All of them, however, would be placed onstream in "Special Protection" waters. Thus, even if the upstream watershed may be less than 100 acres, or a dam is less than 3 feet in height, the associated impacts in these "High Quality" waters may not be insignificant in or downstream from the affected stream segments.

☑ **All impoundments proposed in Special Protection waters, and especially those proposed in the headwaters, must be evaluated for any impacts that may occur to existing and future uses of those waters as well as for any changes they may cause to the hydrologic balance of the area.**

(D) Attachment 13.2 included design calculations for each of 8 sedimentation ponds and 2 water treatment ponds. This number of sedimentation ponds differed from the 7 listed in the October 2010 revision of Module 12, which omitted Sediment Pond R1 and Treatment Ponds 1 and 2. It was not clear what the applicant proposed to build.

☑ **The discrepancies between Module 12 and Module 13 (and possibly others) regarding sediment ponds and outfalls must be corrected for internal consistency and for water quality protection.**

(E) Section 13.5.c noted: "*Accumulated coal fines from the coal fines containment structures shall be removed as often as it may be necessary to keep the structure functional. Sludge will be transported and disposed of at an approved facility.*"

☑ **Again, needed refuse disposal areas must be evaluated as part of the mine application. If an offsite facility is to be used for refuse disposal, the offsite location must be identified, the length of time it will be used must be stated, and the associated access roads, traffic, and transportation impacts must be evaluated.**

MODULE 14 - Liners

(A) The obsolete April 2001 version of Module 14 was used instead of the September 2008 version which was current at the time of application.

☑ **A current Module 14 must be completed and submitted.**

(B) Section 14.6 stated: "*Sludge will be transported and disposed offsite at an approved public landfill, or at Foundation Mine's coal refuse disposal area when it is developed.*" The potential impacts associated with the transport of sludge to an offsite location, even temporarily, were not evaluated. Onsite coal refuse disposal was not identified or evaluated in the 2010 State underground mine application.

☑ **Again, all aspects (including coal refuse disposal) of the Foundation Mine project must be identified and evaluated so that the overall impacts of a working longwall mine can be properly identified and assessed.**

MODULE 15 - Streams/Wetlands

(A) The obsolete January 2006 version of this Module was used, even though the version revised September 2008 was current at the time of the application. The obsolete version of the Module does not incorporate the requirements of TGD 563-2000-655, such as detailed pre-mining bioassessment and inventory of all streams and the delineation of all wetlands above the longwall mine area.

☑ **A current Module 15 must be completed and submitted.**

(B) One of the more significant differences between the 2006 version of Module 15 that was used in the Foundation Mine application and the 2008 version that should have been used is that the older version omits the following very important item (numbered as 15.1.c. in the 2008 version):

> **Provide a narrative that demonstrates that no adverse hydrologic impacts, water quality impacts, or other environmental resources impacts will occur as a result of the variance.**

As discussed in Section C1 of the main report, the demonstration of a lack of adverse hydrologic impact as a result of granting a stream buffer variance clearly is required by 25 *Pa. Code* 86.102.

In the 2006 version of Module 15 used by the applicant, Section 15.2.c. elicits somewhat similar information but in a less stringent way ("[*provide*] *an assessment of the probable hydrologic consequences ... on the water quality and quantity, and the resident aquatic communities*"). The response provided by the applicant was concise and straightforward, but hardly satisfactory:

> *The majority of streams proposed for impact will be filled, eliminating their contribution to watershed hydrology and potential as aquatic habitat.*

While this was a candid admission of the intended direct destruction of the streams themselves, it did not address the resulting implications for the broader hydrologic systems, nor did it even begin to address the demonstration required pursuant to §86.102. It also did not demonstrate how the activity would either result in an environmental enhancement or prevent degradation of Special Protection waters. It also ignored the additional permanent loss of stream habitat that would result from constructing multiple coal refuse disposal areas.

☑ **The applicant must fully comply with the passage above (from 15.1.c. in the 2008 version) and §86.102; the proposed plans must demonstrate that there will be no adverse hydrologic impacts. Otherwise, the CDMO cannot lawfully approve the application.**

(C) Table 15.1.a. listed the lengths of streams for which a "variance" was required for activities within 100 feet of a stream. According to the 2010 application there were more than 4.5 miles (24,370 linear feet) total of Special Protection streams in that category. [In fact, there were more than twice that number of miles of stream impacts identified in the 2012 Corps 404 application for Foundation Mine, which included activities not included in the application to the CDMO.] Section 15.1.b. solicits a description of the purpose and justification of the proposed activities where a variance is needed. The only "justification" provided was the circular, self-serving claim that each proposed activity was needed to operate the proposed mine.

☑ Each direct and indirect disturbance of Special Protection streams (amounting to many miles in total) must be fully justified or no permit can lawfully be issued.

(D) As noted in Section C of the main report, most of the Foundation Mine variances required for work within 100 feet of a stream actually were for work <u>in</u> the streams themselves, typically for filling and eliminating the entire stream. More than 13,423 linear feet of streams (all HQ or EV Special Protection waterways) were proposed to be directly impacted by surface facilities [many more such streams were to be impacted according to the 2010 Corps 404 application]. Remarkably, none of those direct impacts to Special Protection streams was proposed to be mitigated. Instead, the impacts were all viewed as "temporary" by reasoning that after the mine operations ended, in 20 years or more, the filled streams would be excavated and returned to their approximate original condition. [what about the impoundment and coal refuse areas? Permanent ??]This was less clear in the CDMO mine application than it was in the Corps 404 application, where it was described as follows:

> PADEP- CDMO indicated that mitigation .... was waived for stream impacts resulting from the "temporary" impacts from surface facilities (prep plant, shaft and slope pads, stockpiles and associated facilities) in areas where the cut and fill embankments would be returned to "approximate original grades". Mitigation was also waived for surface facility impacts to those waterways that possessed less than 100 acres drainage area.

The applicant's response in Module 18.6 noted: "*Except for Hoge Run, stream sections to be impacted by proposed operations will be restored as indicated on the drawings presented in Attachment 18.1.e.*". In other words, the approximate existing ***<u>physical</u>*** condition of impacted streams was proposed to be reestablished. In Section 15.2.o.i. the following was noted:

> *All areas of the Surface Facilities, excluding the Batch Weigh Facility (1,014' perennial, 87' intermittent), are proposed to be re-graded to pre-mining conditions with the eventual closure of the Foundation Mine.* ***Per PADEP-CDMO request****, streams identified for impact will be covered with rounded river gravel and geotextile fabric prior to filling. When reclamation of the site commences, excavation will stop when the geotextile fabric is encountered. In this way, the streambed will be minimally impacted, and once normal hydrologic flows are achieved within the watershed, the stream will resume its function within the watershed's aquatic habitat.* [bold added for emphasis]

In other words, most of the stream impacts involved filling of Special Protection waters for at least a 20-year timeframe, followed by daylighting of those streams (excavation to their approximate original contours). The plan to "restore" those streams, however, involved only physical restoration; there were no plans to address the existing "high quality" or better biological uses of the Special Protection waterways. TGD 563-2000-655 in part defines an "adverse impact" to a stream as "*a greater than 12% reduction in the total biological score of a stream reach based on a comparison of pre- and post-mining scores*". No plans for evaluating such comparisons were proffered for these Special Protection streams which will be filled for 20 years or longer.

Because the filled streams eventually would be excavated, the applicant suggested that there would be no impact (and apparently the CDMO agreed) and so no other mitigation during the 20-year life of the mine or longer-term was proposed to be needed (although, see Module 15 "L" below). Future uses and functions of these Special Protection waters apparently were expected to return on their own, and so no monitoring or bonding was proposed to ensure that they did; similarly, no bonding was proposed to implement contingency plans in the event that the proposed daylighting of filled streambeds did not restore the pre-mining biological quality of the onsite waterways. A recent empirical study (Doyle and Shields 2012) suggests that this proposal for restoring streams at Foundation Mine would not work --- that physical habitat manipulation often is proposed or used in stream restoration efforts, but it is increasingly seen as ineffective in restoring biological function or pre-disturbance water quality.

DOCUMENT NUMBER:	391-0300-002
TITLE:	Water Quality Antidegradation Implementation Guidance
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APPENDIX D

ANTIDEGRADATION BEST AVAILABLE COMBINATION OF TECHNOLOGIES FOR MINING ACTIVITIES

1. GENERAL

Mining involves a wide variety of activities that disturb the surface of the land. Mining activities such as coal surface mines and small industrial minerals surface mines are temporary and may exist for a year or two at any one location. Large quarries and underground mines can be considered permanent since they may exist for 10 years or longer. Consequently, water discharged from mining activities can be intermittent or continuous and, before treatment, highly variable in quality. Effects of mining activities on streams include changes in both water quality and physical habitat (including stream flow) which can change the composition of the aquatic biological community.

The PADEP Antidegradation Guidance (above) suggests that the 20+ years for which the Foundation Mine was proposed to be in place would be "permanent", not "temporary" as the CDMO apparently was willing to view it.

☑ The casual disregard of such significant impacts to Special Protection streams by both the applicant and the CDMO was entirely unacceptable. Direct impacts to many miles of Special Protection waters lasting 2 decades or more must not be viewed as "temporary" and must not be allowed at all unless and until (A) each impact is fully justified in accordance with §86.102 ("*beyond a reasonable doubt that there will be no adverse impact*"); (B) each actual impact is credibly documented as improving or enhancing the stream (per TGD 391-0300-002); and (C) a detailed mitigation and/or compensation plan with monitoring of success is provided for each justifiable impact, which includes bonding both for onsite restoration work and for contingency plans.

(E) In characterizing the resident aquatic community in Section 15.2.c., the applicant noted that sampling stations on five streams (HQ4, HQ5, HQ7, HQ8, HQ9) were evaluated using PADEP's antidegradation protocols in conjunction with a petition that had previously been submitted to the Environmental Hearing Board with a request to downgrade some of the streams in this area. It did not mention that its previous effort to downgrade those streams was unsuccessful, and that its proffered documentation did not accurately represent the actual existing uses of the subject streams (which in fact were found to be attaining *higher* uses than previously recognized). Instead, the applicant resubmitted the same discredited data in the 2010 mine application.

Some of the stream bioassessment data submitted with this 2010 permit application had been collected and used by this applicant in an (unsuccessful) attempt in 2008 to formally downgrade the designated uses of some of these streams from HQ-WWF to WWF (warm water fishery). Those data were discredited, and none of the streams were downgraded; indeed, five of the streams were determined to have better than HQ quality and were *upgraded* to EV existing use.

The applicant's data would suggest worse-than-HQ water quality conditions at all of these five stations; by contrast, the existing water quality had been found by PADEP aquatic biologists and by others (Stout 2009; Schmid and Company, Inc. 2009) to be equivalent to HQ or better in most places (including at Sampling Stations HQ7 and HQ8, which were found to qualify as, and now are listed as, attaining EV uses). The data used in the applicant's petition to try to downgrade these streams (and then resubmitted in this 2010 mine application) were effectively discredited by the sampling of others, including the Department's own Bureau of Water Quality Management staff. They should not have been accepted by the CDMO.

☑ The erroneous, discredited data at those five stations must not be used in any baseline assessment in the Foundation Mine application. Rather, new and credible data for those streams must be collected for the applicant by qualified professionals, and the new data must be evaluated carefully by PADEP prior to acceptance.

(F) In addition to the five stream segments discussed above in E, the applicant conducted bioassessments on numerous other streams in the proposed permit area in accordance with TGD 563-2000-655. Since the data obtained on the five segments mentioned in E above had been discredited, that raises questions about the accuracy of the other bioassessment stream data provided in this application.

☑ CDMO biologists (or aquatic biologists from PADEP Harrisburg) must carefully check the accuracy of the bioassessment data submitted for all stream segments inventoried for the Foundation Mine application.

Notwithstanding this applicant's past history of mischaracterizing streams, some of the pre-mining data collected and submitted as part of the 2010 application indicated quite good water quality in certain streams. High TBS (total biological score) results calculated for certain project area streams by the applicant indicated streams that are likely to be attaining uses *higher* than their designated uses. PADEP is responsible for protecting the existing uses of all Commonwealth streams, and so the CDMO is required to make an "existing use determination" every time it reviews or approves a mine permit[9]. At minimum those streams which this applicant's data suggested may be better than average (TBS of 70.0 or higher) should be independently reviewed by the PADEP Harrisburg Office of Water Quality Assessment. Specifically, in the subject Foundation Mine application, the following stream stations exhibited particularly high TBS scores according to the applicant:

Hargus Creek	Garner Run/McCourtney Run	House Run
HAR T14d -- **83.9**	GAR 1 -- **82.0**	HOU 6 -- **88.2**
HAR T14b -- **85.0**	MCR 2 -- **74.8**	HOU 9 -- **77.9**
		HOU 13 -- **75.3** and **73.9**
		HOU 14 -- **81.3**

☑ The attained uses of the above streams, at minimum, should be examined by PADEP, and the existing use of each should be upgraded if appropriate.

(G) The applicant's response in Section 15.2(h) mentioned that certain streams "*have been given the preliminary classification of Exceptional Value (EV)*". The use of the word "preliminary" would suggest that those streams may not be formally recognized as EV streams. In fact, however, once any stream has been determined to be meeting EV uses on the basis of in-stream evaluation (as these were in 2009), that stream is

[9] *Existing use protection shall be provided when the Department's evaluation of information (including data gathered at the Department's own initiative, data contained in a petition to change a designated use submitted to the Environmental Quality Board pursuant to §93.4d(a), or data considered in the context of a Department permit or approval action) indicates that a surface water has attained an existing use.* – 25 Pa. Code §93.4c(a)(1)(i)

to be regulated and treated by PADEP as EV for all regulatory purposes henceforth, with no future possibility of redesignation to a lower category.

☑ All attained-use EV streams in and adjacent to the Foundation Mine permit area must be clearly indicated as such on all maps and in all descriptions and assessments in the application.

Any wetland along or within the floodplain of an EV stream is (by definition) an EV water itself, as well as being considered an "Exceptional Value wetland" per 25 *Pa. Code* §105.17(1)(iii). HR-2 was a wetland delineated by the applicant at the confluence of two sections of House Run tributaries that both have EV existing uses. This wetland clearly was within the floodplain of at least one, and maybe both, EV tributaries. Also, HR-3 was contiguous with an EV section of a tributary of House Run. Any wetland along a stream currently recognized as EV, or along other streams that may be attaining EV uses but are not yet so recognized, would by regulation be an "Exceptional Value wetland" and must be so designated in the application. Accordingly, both Wetland HR-2 and Wetland HR-3 should have been identified with a "Y" (yes) response under number "iv" in the Form 15A Wetland Inventory. Instead, they were incorrectly listed as "N" (no).

☑ All "Exceptional Value wetlands" in and adjacent to the mine permit area must be clearly indicated as such on all maps and in all descriptions and assessments in the application.

(H) An approximately 6,000 linear-foot long section of Hoge Run (designated HQ-WWF) was proposed to be relocated, and in the process shortened by more than 800 feet. The existing physical and hydraulic characteristics of Hoge Run were studied and the post-relocation channel reportedly was designed to accommodate existing flows. Only one pre-mining biological monitoring station, however, was established along the entire length of Hoge Run main stem. That one station was located near the mouth of Hoge Run and thus was not representative of the higher-quality conditions elsewhere along its length, and particularly in its headwaters.

As mentioned previously, a recent study (Doyle and Shields 2012) found that physical manipulation of streams by itself typically is not adequate to restore the biological function or water quality of damaged streams. There was no indication in the applicant's 2010 Stream Relocation Plan that it proposed to, much less would, maintain the stream's current "HQ" uses. It was merely stated that, post-relocation the stable stream channel and riparian buffer "*should bring the stream to a state of biological viability*". "Biological viability" was not defined by the applicant, but presumably it was not a high or definitive threshold (the TGD 563-2000-655 standard of a less than 12% reduction in total premining biological score should have been used). The relocated stream corridor was proposed to be only 25 feet in total width including its riparian buffers, and it would be surrounded by industrial land uses. No monitoring was proposed to evaluate post-relocation or post-restoration conditions in the stream.

☑ If this application is ever resubmitted, baseline biological assessments must be performed on the upstream segments of Hoge Run proposed for relocation. A monitoring plan must be prepared to assess the post-relocation condition of Hoge Run to ensure that it continues to meet HQ uses. A permit condition must be inserted to direct that monitoring continue for a minimum of 5 years following relocation, or longer if the stream has not met HQ uses by then. Any proposed net loss of waters of the Commonwealth must be addressed and mitigated appropriately.

(I) All wetlands on or within the surface facilities area of Foundation Mine allegedly were delineated and were identified in Section 15.3 (2006 version used in this application). A total of 10 wetlands was identified within the 642-acre surface area of this State application. Within that same 642-acre area, there were 17 additional wetlands identified in the Corps JD (Jurisdictional Determination) which are not identified in this application. Thus, the applicant greatly misidentified the extent of wetland resources at risk of impact from the proposed Foundation Mine operations. Furthermore, within the 1,867-acre area reviewed by the Corps, there reportedly were 45 identified wetlands (see **Figure 5**). More than half (28 of 45) of those wetlands were not identified in the 2010 CDMO mine application. Some of those additional Corps-identified wetlands, such as F-41, qualify as being exceptional value wetlands and EV waters (as discussed in Section F of the main report), and must be so characterized in the application.

☑ All wetlands identified by a Corps JD within the surface activity areas of a mine project area must be included in the inventory for the application, and proposed impacts to them must be evaluated and included in the tabulations.

NOTE: There were only 4 NWI wetlands in the 1,867-acre area examined by the Corps, in which the Corps identified 45 wetlands --- further evidence that the past reliance on NWI maps by applicants and CDMO was entirely inappropriate and incapable of offering protection to wetland resources.

(J) Throughout the proposed underground mine area for Foundation Mine, there were 8 wetlands identified on the NWI (National Wetland Inventory) maps that are not near any applicant-mapped wetlands. Although the NWI mapping is far from perfect, it tends to identify larger, more obvious wetlands and to miss many smaller wetlands obscured by forest canopy in Pennsylvania. There was no explanation provided in the Foundation Mine application for why areas mapped as wetland by NWI were believed not to be wetland.

Brief field inspections were conducted by Schmid & Company ecologists during June 2012 and April 2013 of selected areas above the proposed underground permit area

of Foundation Mine outside of the surface activities area. Numerous additional wetlands were observed (see **Figure 7**), wetlands that were not delineated in this permit application or reviewed/confirmed by Corps JD. One wetland of significant size (approximately 5 acres) was observed along the south side of Bristoria Road, within State Game Lands #179 (see **Figures 6a** and **6b**).

☑ To facilitate their protection, all wetlands above and within 1,000 feet of surface and underground permit areas must be delineated, confirmed by Corps JD, identified on drawings, and evaluated in terms of direct and indirect effects of mining activities.

(K) In Section 15.2, predicted incidents of stream pooling were identified by the applicant, generally following the PADEP guidance in TGD 563-2000-655. The analysis used the 20-year old CISPM 2.01 model to predict specific segments of streams where pooling was expected to occur. As discussed in Sections C2 and E2 of the main report, there are at least 21 segments of streams where pooling was predicted, all in Special Protection waters. Only 4 of those pooling incidents were predicted to be more than 1.0 foot deep, however, and thus only those 4 required plans for restoration per the TGD, which affords no special protection to Special Protection waters affected by mining.

The format of Module 15 (the 2006, 2008, and 2012 versions) continues to be deficient because it solicits information only about the location and nature of wetlands that are within the "permit area of surface mining activity sites or within stream restoration sites". Apparently excluded are any other wetlands that are above the underground mine permit area --- where the proposed use of longwall methods makes land subsidence a virtual certainty. The protections addressed in TGD 563-2000-655 relate to all wetlands at risk of damage by subsidence. The TGD definition of "adverse effect" with regard to wetlands includes: "*a loss of hydrology such that wetland conditions cease to exist*", or "*the diminution of groundwater or surface water resources sufficient to interfere with the functions and values of a wetland*". Furthermore, the TGD definition of "mining induced change" with regard to wetlands includes "*an apparent change in a wetland's surface area, hydrology, or existing vegetative community, which is due to underground mining operations.*" Potential impacts to wetlands by mining cannot be evaluated if the wetlands have not been inventoried. [Underlining added]

The CDMO should revise Module 15 to elicit the data required by TGD 563-2000-655 and to provide full delineations of all wetlands above and adjacent to the underground mine permit area (in addition to the surface facilities areas).

The presumption that pooling of less than 1 foot has no impact is an arbitrary CDMO threshold that has not been carefully studied or field-tested. If a free-flowing stream becomes impeded by pools 11 inches deep, especially a stream that is a Special Protection water (as are all those in the Foundation Mine project area), that stream is going to experience significant changes, including an increase in sediment and other adverse effects that necessarily will degrade the aquatic habitat and overall quality of the stream.

☑ All HQ or EV streams that are likely to experience pooling of any depth, water loss, bed heaving, or other alteration must be identified, and plans must be prepared to restore such Special Protection waters if their existing uses are damaged as a result of coal mining activities. Monitoring should be proposed, bonded, and scheduled to confirm restoration of the necessary total biological score in areas experiencing pooling of any depth.

(L) There were 4 stream segments where longwall mine subsidence was expected to result in more than 1 foot of pooling, three on Hargus Creek and one on House Run (all of which are designated HQ). Four stream restoration areas were proposed for those pooling impacts (Labeled LW-A1, LW-A2, LW-A3, and LW-F1). Module 19 (Form 19.4) identified the expected costs associated with those restoration efforts.

According to Module 15 there was predicted to be no stream pooling in excess of one foot, and thus no restoration was proposed, in either the Garner Run or the McCourtney Run watersheds. However, Module 15 also included a proposed Restoration Plan for certain reaches of Garner Run and McCourtney Run, reportedly to mitigate for "*the streams impacted within the surface facilities*". Neither the locations nor the lengths of the "impacted" streams were mentioned in the Plan (it may have been intended to compensate for the many miles of "temporary" filling of streams for 20+ years, see Module 15 "D" above). The restoration would have involved relocation of three areas of Garner Run/McCourtney Run totaling about 1,472 feet, plus an extension of 114 feet of House Run. The Plan did not propose that the relocated areas attain any specific level of water quality or biological functioning, nor specify any period of post-restoration monitoring. Furthermore, it was unclear whether the costs of implementing this Restoration Plan were included in those identified in the Module 19 bond costs.

☑ All stream restoration plans must clearly identify the impacts being mitigated in each case, and demonstrate that the proposed restoration will fully replace the functions and values being lost (with an identification of requisite total biological scores). There must also be a plan to monitor each restoration area and to make adjustments if necessary. Detailed cost estimates and bonding commitments must be prepared to ensure that the restoration work will be accomplished as proposed. Given the recent determinations by the CDMO that some nearby streams have not been able to be restored to pre-mining conditions

after being damaged by longwall mining (see Appendix B), contingency plans for alternative mitigation also should be proposed and bonded.

(M) Module 15.4.d. asks the applicant whether "*any wetlands will be indirectly affected by surface mining activities (e.g. altering the wetland hydrology).*" The response for the proposed Foundation Mine was:

> *No wetlands beyond those identified in 15.4.c.i.* [direct impacts] *will be impacted by the proposed surface mining activities.*

Clearly this was not true. There would be significant indirect impacts as a result of the proposed extensive regrading, replacement of forest habitat with industrial land use, and changes to stormwater infiltration and runoff patterns. As discussed in Section B3 of the main report, many "orphaned" or fragmented sections of wetlands which were proposed to remain after adjacent sections were filled, and which were not (but should have been) counted as direct impacts, at minimum constituted indirect impacts.

☑ All of the indirect wetland impacts that construction and operation of the proposed mine would cause must be identified, and mitigation plans must be prepared to fully replace the functions and values lost.

MODULE 16 - Air Pollution and Noise Control

(A) The obsolete April 2001 version of Module 16 was used instead of the September 2008 version which was current at the time of application.

☑ A current Module 16 must be completed and submitted.

(B) Responses in various sections of this Module stated: *The coal preparation facilities will process up to 2,000 tons of coal per hour..... Coal will be crushed, screened, blended, or beneficiated as part of this operation..... Raw and Clean Coal stockpiles will be developed at the surface facility.* The process of cleaning coal creates coal refuse. Yet, no coal refuse disposal areas were included with this 2010 State application (as they were with the 2012 Corps 404 application). The construction and operation of coal refuse disposal areas are likely to have air and noise impacts.

☑ Coal refuse disposal areas, and all other necessary parts of the proposed mine activity, must be identified and evaluated as part of the application.

(C) Because the Foundation Mine operation would process more than 200 tons of coal per day (in fact, it proposed to be capable of processing up to 2,000 tons of coal per hour), an Air Quality Permit was needed from the PADEP Southwest Regional Office, Bureau of Air Quality. The applicant stated that it would apply for that permit.

☑ **Inasmuch as impacts to air quality should be evaluated along with all of the other impacts associated with the proposed mine, so as to have a clear understanding of the cumulative impacts associated with its construction and operation, the information required in an Air Quality Permit application, if not the application itself, should be included in the mine application.**

Module 16 itself is deficient in that it does not require that an Air Quality Permit, if one is needed, be obtained as part of the mine permit application. At minimum, the information required in an Air Quality Permit application should be included as part of an underground mine application.

MODULE 17 - Soils / Prime Farmland

(A) The obsolete April 2001 version of Module 17 was used instead of the September 2008 version which was current at the time of application.

☑ **A current Module 17 must be completed and submitted.**

Module 17 reflects loopholes/deficiencies in the regulations that fail to properly address prime farmland soils and their impacts in any real sense. First, a soil considered to be prime farmland per USDA is not considered prime farmland soil per the mining regulations at 25 *Pa. Co*de §89.121-122 if any one of six exceptions can be met. One of those exceptions is that "*The area disturbed is minimal in size (less than 5 acres) and has been or will be in use for an extended period of time (more than 10 years)".* This exception should be rewritten so that it makes more sense, such as the following: "*The area* **is already** *disturbed***,** *is minimal in size (less than 5 acres)***,** *and has been* ~~*or*~~ **and** *will* **continue to** *be in* **non-agricultural** *use for an extended period of time (more than 10 years)".* However, that is not how it is currently written. As written, it could apply to <u>any</u> future use, and so no prime farmland soil less than 5 acres in size would be protected because every square inch of land everywhere "*will be in*" some use for the next 10+ years. It is circular logic to say that an area that legitimately is prime farmland soil today, but which is proposed for mining for the next 20+ years, is therefore not prime farmland soil worthy of protection from the mining activity.

Second, instead of requesting that USDA confirm the correct identification of prime farmland soils within the project area, mine applicants should be required to get a USDA determination that the proposed activities will have no negative effects on identified prime farmland soils and long-term agricultural productivity.

(B) The applicant suggested that all (nine) areas of prime farmland soil within the 642-acre surface activity area should be excluded from being considered prime farmland soils (*i.e.,* should receive from the CDMO a "negative determination") because they met the exemption at §89.121(b)(6); namely, that each is less than 5 acres in size and will be used for mining for more than 10 years. While the referenced exemption is not clearly worded (see box, above), it is unreasonable to believe that proposing to use a currently undisturbed area for mining for more than 10 years disqualifies it from the protections meant to be afforded to existing prime farmlands from mining. There are, furthermore, considerably more prime farmland soils in the much larger surface activities area actually proposed (per the Corps 404 application), which were not addressed in this application. Also, there are prime farmland soils in the area along Hargus Creek to be disturbed for proposed Restoration Area LW-A2 (it was identified on a drawing for the stream restoration plan in Module 15).

☑ The actual extent of prime farmland soils (on all areas to be disturbed) must be correctly identified, as well as any short-term and long-term impacts to them. Plans for their post-mining restoration must be prepared and approved.

MODULE 18 - Land Use/Reclamation/Fish and Wildlife

(A) The obsolete April 2001 version of Module 18 was used instead of the February 2010 version which was current at the time of application.

☑ A current Module 18 must be completed and submitted.

(B) According to the response given in Section 18.1.e.12: "*The existing land use is forestland, pastureland, unmanaged natural habitat, land occasionally cut for hay, and rural residential area, all accessed by area wildlife".* Then in Section 18.4.c it was stated: "*Foundation Mining, LLC intends to return the area to its pre-mining land use ... Vegetation proposed for reclamation includes plants and trees desireable* [sic] *to wildlife habitat to provide a wildlife enhancement measure".* Finally, in Section 18.1.e.15 it was stated: "*All affected areas, except the Batch Weigh Loadout pad and embankment, the upgraded/relocated section of Hoge Run Road, and the relocated section of Hoge Run and adjacent valley bottom area will be restored to approximate original contour*".

These passages suggest that the rural uses listed above would be displaced by 642 acres (actually, 1,867 acres per the 404 application, plus at least one additional CRDA --- about 3 square miles total) of intensive industrial surface activities devoted to extractive uses for at least 20 years, after which most of them reportedly would be returned to the prior rural uses. In fact, no assurance was given that the pre-mining land uses (forestland, pastureland, unmanaged natural habitat, land occasionally cut for hay, and rural residential area) would be returned to the condition and in the locations and extent that they exist (at present) prior to mine development. Indeed, it

would be virtually impossible, given that mature forestlands would be removed and homes and businesses would be bought by the mine operator and torn down. At best, the approximate original contour of most of the land might be reestablished, and some replanting of vegetation (mainly by seeding and mulching regraded areas) might be done. The applicant's plan --- to fill many miles of Special Protection waters for 20+ years with no plan to provide concurrent compensatory mitigation, but instead to simply excavate their channels at the completion of mining to the approximate premining physical configuration, and to make no attempt to restore their former high-quality aquatic habitat, functioning, riparian buffers, and contributory headwaters --- is unacceptable.

☑ The existing conditions throughout the mine permit area must be restored to the same condition and in the same configurations after mining is completed 20+ years hence. Additionally, documented evidence should be provided of other mines in the area where "return of pre-mining land uses" has been successfully accomplished to demonstrate that such restoration is in fact possible.

(C) The final planting plan for reclamation identified only 4 species of trees --- black cherry, red oak, American sycamore, and red maple --- and they were proposed to be planted at a density of 600 seedlings per acre, with no single species comprising more than 50% of the total number planted. Even if these plantings were successful, it would require many dozens of years for these seedlings to reestablish the mature hardwood forests that were proposed to be destroyed.

☑ The reclamation plan must include followup monitoring and adequate bonding to ensure that the proposed extent of new forest is successfully established.

(D) The following response was given in Section 18.4.a:

> "*Although the relocated section of Hoge Run will not be returned to its pre-mining location, no change in stream use will result. The "relocated" stream channel will have had 20 years to become established with an aquatic community and to develop mature bank vegetation that will have been planted as part of stream restoration when the channel is constructed. Destroying this mature channel to re-establish the original unvegetated channel that will be subject to additional erosion is not considered reasonable."*

This faulty reasoning was purely self-serving. If it is not reasonable to destroy a manmade stream channel with minimal buffering from adjacent mine activities that had only 20 years to "mature", it cannot be reasonable in the first place to destroy a stream that has had centuries to establish its current "high quality" condition. It is unlikely that the ditch resulting from the proposed relocated, shortened, and *straightened* section of Hoge Run would meet HQ uses, either at any time during the

20+ years that these intensive extractive industrial uses would be operating immediately adjacent to it, or post-mining thereafter. The applicant provided no evidence to support its dubious claim.

☑ At a minimum, specific and detailed information about the existing physical and biological nature of Hoge Run must be collected in accordance with TGD 563-2000-655, in order to establish the current standard against which the relocated stream decades hence could be compared to determine whether its total biological score has declined by 12% or more. Monitoring must be required to verify the applicant's claim that HQ uses will return to the industrial ditch throughout the life of the mine. Also, adequate bonding must be provided to ensure successful restoration as well as contingency planning.

(E) As noted above, there are a few areas that were not proposed to be restored to approximate original contour or to existing land uses (*e.g*., the Batch Weigh Loadout pad and embankment, relocated Hoge Run Road). The coal refuse disposal areas, which were not included in this application (but should have been) also would not be returned to pre-existing uses, but would remain permanently as potential sources of water pollution.

☑ In accordance with §89.65, §89.67, and §89.74, a demonstration must be made that the adverse impacts to wildlife of all permanent facilities and land use changes (including those known to be needed but not included in this application) have been minimized.

(F) There was a discrepancy between this statement provided by the applicant in Section 18.5d.3: *Wildlife habitat planting is not proposed for this permit application"* and this one from Section 18.6.d: *"The proposed vegetation also includes plants desireable* [sic] *to wildlife habitat to provide a wildlife enhancement measure."*

☑ Whether or not planting specifically for wildlife habitat enhancement is proposed must be made clear. If proposed vegetation is simply comparable to existing vegetation, it may qualify as restoration but may not constitute "enhancement". Tree seedlings eaten by wildlife will have to be replanted and protected until well established, if forest cover eventually is to be obtained.

(G) The response to Section 18.6.b stated: "*There are no habitats of unusually high value identified within or adjacent to the limits of the proposed permit area".* In fact, however, there were five streams in and adjacent to the permit area that had been determined to be attaining Exceptional Value (EV) uses, the very best habitat in the Commonwealth for aquatic organisms and Outstanding National Resource Waters.

☑ Because of their unusually high quality, those five EV stream corridors [including any wetlands along them, which by definition constitute

"Exceptional Value wetlands" per Chapter 105.17(1)] provide habitats of unusually high value. The application must reflect this fact, as well as recognize the other onsite streams as High Quality.

MODULE 19 - Reclamation Schedule and Cost Information

(A) The obsolete April 2001 version of Module 19 was used instead of the September 2008 version which was current at the time of application.

☑ **A current Module 19 must be completed and submitted.**

(B) The total proposed reclamation bond for Foundation Mine was $21.3 million, of which $480,000 was for stream restoration in four areas. It appears that the restoration funding was only for the four expected pooling impacts from longwall subsidence, and not for the daylighting of many miles of streams being filled for surface activities. Stream restoration was proposed to be done in 2035, approximately 20 years after mining was to begin. For monitoring the stream restoration, the cost was stated to be "*for engineer being on site for duration of project. Estimate for length of project 4 weeks*." Perhaps this meant 4 weeks' time spread over a much longer period of monitoring (such as 5 years, which would be typical), but that was not at all clear; it is quite likely that the 4-week period referred exclusively to the time while the proposed restoration measures were being constructed, and no monitoring was to be provided.

☑ **Restoration costs and schedules appear to have been grossly underestimated. The applicant should be required to document the accuracy of the estimates by comparing them with comparable work at the applicant's parent company's restoration sites at Emerald and Cumberland Mines which have been found by the CDMO to be successful in achieving full restoration in accordance with TGD 563-2000-655 (assuming any such exist).**

(C) All of the streams that would require restoration are designated High Quality and some may qualify as having attained Exceptional Value existing uses. The proposed restoration plans did not address the biological integrity of these streams or propose to replicate their current high quality nature and uses. To do so undoubtedly would be more costly than what was proposed for bonding in Module 19. Presumably the engineer was not going to monitor macroinvertebrates either during the 4-week period mentioned above or thereafter, so there apparently was no money allocated to report the success or failure of restoration of the high quality biological conditions of any stream.

The loss or degradation of these Special Protection streams and their watersheds for the short-term extraction of a finite fossil fuel source would come at a high

environmental cost. Replacement or restoration should not be expected to be any less costly; indeed, it probably should be expected to be more costly, if for no other reason than to encourage avoidance of impacts initially. Restoration success also is highly uncertain, so contingency plans would be appropriate for inclusion and for bonding in this application. As with many things, prevention of damage is often less expensive in the long run than repair.

☑ The applicant must demonstrate that the costs assigned to restoration are sufficient to cover in full the replacement of the biological integrity and functional uses of the stream networks that would be damaged, as well as the multi-year monitoring of those efforts.

(D) The proposed stream restoration did not address any daylighting after 20+ years of the many miles of streams that would be filled to accommodate surface facilities. The reclamation costs did not cover any work to ensure that the daylighted streams actually met their pre-mining biological functions and uses. The costs also did not appear to include the relocation of Hoge Run or mitigation for the permanent net loss of more than 800 feet of that stream. Stream flow loss damages due to longwall mining activities also did not appear to be included at all (presumably because, unlike for pooling, there is no model currently in use for predicting flow loss so none ever is predicted). Unanticipated subsidence-related losses of water in streams (not to mention springs, wells, and wetlands) will require restoration activities such as grouting and other activities described in Module 15.

Work to attempt to restore streamflow can last as much as five years, and even then may prove to be unsuccessful and require additional mitigation (see Appendix B). None of those predictable stream impacts was included in the applicant's reclamation plans or costs. This is an apparent deficiency in Module 19 (both older and current versions) that must be corrected by the CDMO.

☑ All proposed and predictable hydrologic impacts from longwall mining must be factored into the reclamation plans and cost estimates, and a significant contingency amount should be provided to cover unanticipated damages and failure to achieve biological restoration.

(E) As the impacts on global warming from coalfired electric generation are revealed to be more serious and imminent, the financial stability of mine operators like Alpha Natural Resources becomes less certain. News such as "*Alpha Natural Resources ("ANR")'s stock price had lost about 97% of its value falling from a peak of $108.73 in June 2008 to $3.88 on Friday May 30, 2014*" and "*Alpha Natural Resources reported over $1 billion in losses for 2013 and a net loss of over $55 million for 2014 Q1*"[10] do not inspire confidence that restoration/reclamation of direct or indirect damages caused by the longwall operations of this applicant are assured.

[10] "Geology's war on coal", 3 June 2014. http://climatecrocks.com/2014/06/03/geologys-war-on-coal/

☑ The uncertain financial situation of Alpha Natural Resources or its successors point out the importance of securing adequate up-front bonding to assure successful restoration and reclamation.

MODULE 22 - Subsidence Control and Underground Mine Maps

(A) The obsolete February 2004 version of this Module was used rather than the version revised September 2008 which was current at the time of this application.

☑ A current Module 22 must be completed and submitted.

(B) Section 22.1.f. asks the applicant to "*Describe whether subsidence, if it is likely to occur, could cause material damage to any structure or could adversely affect any water supply*". The applicant's response was as follows:

> *Typically, the surface over a longwall panel will subside with a gentle, trough-like depression. The majority of this settlement occurs during the first few weeks of mining. Causing subsidence to occur at a predictable time and manner minimizes or prevents damage to structures by affording the responsible party an opportunity to take measures to monitor and to address any likely impacts. Subsidence may adversely affect water supplies but if so Foundation Mining, LLC will comply with the requirements of Act 54 as applicable.*

The applicant used circular logic to try to justify the damage that would be caused to structures --- stating that the very thing that would cause the damage (subsidence from longwall mining) was the appropriate way to minimize or prevent the damage simply because the damage was predictable. Not all subsidence is "gentle"; irregular subsidence can cause severe damage to structures, wells, and other features. While it is true that immediate subsidence may offer an "opportunity" to address expected impacts, the applicant merely committed to comply with the requirements of Act 54. The three Act 54 5-Year Reports completed to date demonstrate that longwall-related impacts are more frequent, more severe, and take longer to "resolve" than impacts from traditional room-and-pillar mining, with actual repair occurring in less than 10% of the cases of structure or water supply damage in Pennsylvania.

☑ In light of the findings of the Act 54 5-Year Reports, applicants should be required to describe the specific kind of resolution (repair, replacement, monetary compensation, property purchase, etc.) that will be provided for each anticipated structure and water supply damage. The CDMO must revise this Module to make clear the specific proposed resolutions expected and proposed by the applicant.

(C) Section 22.1.h asks for a description of measures to be taken to minimize damage or destruction to various things (including water wells). In the response regarding water wells, the applicant stated it would do as Act 54 requires. Act 54, however, does not require *minimizing* impacts, only restoring or replacing water supplies after the fact. Apparently this applicant intended to do nothing at all to minimize potential damage. If a new water supply would need to be developed, the applicant proposed to do such things as digging the existing well deeper, digging a new well, developing springs, or connecting the property to public water. None of those measures would actually minimize damage to individual water wells, or more importantly to the aquifer, the actual water source. Those measures would only provide some remedy after the fact for an individual landowner. This response would have been more appropriate under Section 22.1.m which asks for methods that will be used to mitigate subsidence damage that may occur.

☑ As this Section requests, the applicant must describe measures that will be taken to *minimize* damage or destruction to water wells.

(D) Section 22.1.i. asks the applicant to describe any agreements with property or utility owners which relate to mining beneath certain features, such as water wells. The applicant's response (in mid-2010) was that there were no such agreements at that time.

☑ The CDMO should require the applicant to provide copies of any such agreements that have been made before it completes its review. Any permit must contain a special condition requiring the permittee to file a copy of each such agreement with the CDMO during the life of the permit.

(E) Section 22.1.l. asks the applicant to "*describe the anticipated effects of planned subsidence*". In response, the applicant stated: ***Based on results of past monitoring, the maximum vertical surface displacement ranges from 3.3 to 3.7 feet.*** While this described the subsidence that doubtless will occur, it did not address the "anticipated effects" as required.

☑ The CDMO should require the applicant to provide detailed descriptions of the effects that 3.3+ feet of vertical displacement will have on the structures, wells, and streams above every longwall panel depicted on Exhibit 22.4-3.

(F) Section 22.1.m. directs the applicant to "*provide a statement that water supplies will be restored or replaced*". The applicant did not provide the requested statement, but instead carefully stated that water supply loss would be addressed in accordance with the requirements of Act 54. For damages both to water supplies and to structures, Act 54 provides operators more options than to "restore or replace"; they can provide compensation, acquire surface lands, or enter into other private agreements which may result in the water supply or structure never being restored or

replaced (at most existing longwall mines in Pennsylvania that is the ultimate outcome).

☑ **As mentioned in B above, the CDMO must require the applicant to describe the specific kinds of resolutions (repair, replacement, monetary compensation, property purchase, etc.) anticipated for the water supply damages that will be caused by the mine, and the expected proportion of each based on prior mining experience. If approved, a special condition should be included in the permit that updated information on damage resolution statuses is to be included in every future application for mine revision or expansion.**

Module 22 (the 2004 version used in the 2010 Foundation Mine application and every subsequent revision) is deficient in a number of ways. Up-front it directs the applicant to (at minimum) address subsidence which will occur within merely the 5-year initial term of the permit, thus effectively piecemealing the evaluation of impacts. Also, Section 22.1.i (2004 version) asks the applicant to describe any agreements with property or utility owners which relate to mining beneath certain features such as water wells. The 2008 and later revisions of Module 22 delete that section. That section should be reinstated, but revised to require that applicants provide a copy of any such agreements, whenever they have been made, as part of the application or subsequently upon execution.

Section 22.1.j. (2004 version) asks an applicant to address certain items as they relate to maintaining the value and reasonably foreseeable uses of perennial streams. [Note: Section 22.1.j was deleted from the 2008 and 2012 revisions.] The first part, quoted below from Section 22.1.j.1., raised an important point, but unfortunately it applied only to expansion of "existing" mines (and thus was not answered in this application for a new mine).

> *[I]ndicate whether any monitoring data exist to determine whether mining has caused stream flow reductions sufficient to adversely affect stream uses. If the monitoring data indicates impacts, describe the percent extraction and how close mining was to the stream when the effects occurred. Also indicate if the stream has recovered or was successfully repaired, and provide documentation.*

Section 22.1.j should be reinstated in a revised Module 22. Furthermore, in light of recent determinations by PADEP that longwall mining has caused irreparable stream flow reductions sufficient to permanently affect stream uses adversely (Appendix B), this requirement should be changed so it applies to any mine application, not only for expansion at existing mines. An applicant must be required to document in detail why any proposed new longwall mining will not have the same adverse impacts as at other comparable mines nearby.

(G) In Exhibit 22.4-3 the applicant identified the layout of proposed longwall panels, as well as some existing and proposed features (there were no details for any of the coal refuse disposal areas, the water impoundments, the water pipeline, or railroad sidings --- additional facilities that were known to be necessary for the practical operation of the proposed Foundation Mine). As noted previously, the density of existing wetlands delineated above proposed longwall panels was significantly less than that in the surface facilities areas, which suggests that less effort by the applicant and less (or no) review by the State and federal wetland regulatory agencies was expended to identify wetlands at risk from subsidence above the underground mine areas.

☑ Exhibit 22.4-3 must identify all surface facilities that are needed to operate the proposed mine, including those which have been proposed in other applications submitted to the PADEP and the Corps of Engineers. Also, all additional wetlands identified by the Corps in the 1,867-acre area examined for the JD, plus additional wetlands not yet identified above the rest of the underground mine permit area, must be added to this exhibit after an expanded or supplemental JD has been issued by the Corps of Engineers.

(H) In Exhibit 22.4-3-10 the applicant identified the mine map grid as well as individual properties overlaid on the 9,438-acre mine permit area. Both the mine grid and the property information extended a considerable distance beyond the edge of the mine itself as proposed. Some areas on this exhibit portrayed areas to be mined beyond the stated 20-year life of the mine (*e.g.*, "*years 21 to 25 years*").

☑ The ultimate limits of proposed mining, including any potential future expansions, must be clearly indicated on these maps.

(I) The applicant's Attachment 22.5 was correspondence dated May 2006, sent to the Clerk of Greene County and to several property owners in Franklin Township regarding "NOTICE OF INTENT TO MINE". However, this correspondence involved "Cumberland Mine" and had nothing to do with the proposed Foundation Mine.

☑ Any required notices or other correspondence not related to Foundation Mine must be corrected and resent.

MODULE 23 - Mine Openings

(A) The obsolete April 2001 version of this Module was used rather than the version revised September 2008 which was current at the time of this application.

☑ A current Module 23 must be completed and submitted.

MODULE 24 - Special Protection Waters

(A) The obsolete April 2001 version of this Module was used rather than the version revised September 2008 which was current at the time of this application. Currently, there is no Module 24[11].

☑ Form 5600-PM-MR0007 (and the associated Form 5600-PM-MR0028 to address socioeconomic justification for impacts on HQ waters) must be completed and submitted.

(B) The applicant's Attachment 24.1A listed 9 NPDES discharges. Only 7 NPDES discharges were listed in Modules 6 and 12.

☑ The number and location of proposed NPDES discharges must be accurate and consistent throughout the application.

(C) It was stated: "*Discharges from the surface facilities sites to the receiving streams will be of short duration temporary discharge until a slurry impoundment is constructed".* The slurry impoundment was to be constructed within one year of the beginning of mining coal.

☑ If the slurry impoundment is not proposed to be built as soon as mining of coal is proposed to begin, the applicant must explain why, and must describe where the waste is going to be trucked and disposed before the impoundment is operational.

(D) In Section 24.2 it was stated that none of the discharges would be to streams "classified as" EV. It was true that the currently designated use of the streams to which discharges were proposed was HQ, but the actual attained [existing] use of those streams could be EV. Neither the applicant nor the CDMO conducted the appropriate stream assessments to demonstrate the existing use of any of the proposed receiving streams. Other streams in the vicinity at one time were believed by this applicant to have had uses lower than their HQ-designated use, but upon closer inspection several of them were found by PADEP to be attaining EV existing uses. The same very likely could apply to the proposed receiving streams.

☑ The existing attained uses of each stream where a discharge is proposed must be determined by the PADEP Water Quality Assessment Bureau. Alternatively, new and credible data on the existing attained uses of each stream must be collected for the applicant by qualified professionals, and

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11 Since February 2012, Module 24 "Special Protection Waters" has been rescinded. Form 5600-PM-MR0007 "Anti-Degradation Supplement for Mining Permits" now is to be used instead where a mining operation is proposed for Special Protection waters.

the new data must be evaluated carefully by PADEP, given the past submission of demonstrably misleading and unacceptable data by this applicant.

(E) The response in Section 24.4.a.3 stated that the

> *Presently proposed permit application is for mining 9,438 underground acres in the Pittsburgh Coal seam.*

Then, the applicant's response in Section 24.4.a.4 stated:

> *With*[in] *presently proposed underground permit acreage approximately seventy-two million (72,000,000) clean tons of Pittsburgh Coal will be mined. However, for a 20 year mine plan period, as presently contemplated, Foundation Mining, LLC intends to mine approximately two hundred and twenty five million (225,000,000) clean tons of Pittsburgh Coal. Although sufficient reserves exist to extend the life of the mine beyond 20 years, it is impractical at this time to consider such a long duration due to unforeseen technological and socioeconomic factors*.

This discussion was unclear, suggesting that the proposed acreage (9,438 acres) corresponded to 72 million clean tons of coal, but that 225 million clean tons of coal would be mined in 20 years. That would suggest that the 9,438 acres was only one-third of the eventual size of the 20-year mine, which therefore would actually encompass about 29,500 acres. The response in Section 24.4.b.5. also noted that the Preparation Plant would process 17.8 million tons of coal (presumably per year) at full mine production; at that rate it would require only 4 years to process 72 million tons and about 9 years to process the remainder of the total reserves mentioned in the application.

☑ The applicant must be clear and consistent regarding how much coal is expected to be mined over the 20-year timeframe proposed for the mine, as well as how many additional years the mine is expected to remain active if market conditions warrant mine expansion. The full potential extent of the mine and any anticipated expansions must be identified and included in all analyses and evaluations.

(F) The economic analyses provided in Section 24.7 were based on 225 million tons of production, which was more than 3 times the amount that the applicant suggested would be produced by the proposed 9,438-acre mine (see E above). Thus, either the economic benefits of the proposed mine were being overstated by more than 300%, or the size of the mine as proposed was only one-third its actual eventual size. If the latter, the overall adverse impacts for the proposed Foundation Mine also were significantly understated.

☑ The applicant must not be allowed to take "credit" for any economic benefits associated with mining beyond the 20-year timeframe and 9,438-acre

underground mine permit area while only identifying the impacts associated with the shorter-term and smaller operation.

(G) The proffered economic analysis assumed that there would be 887 full-time employees. If true, that level of employment would exceed every other longwall mine in southwestern Pennsylvania. Furthermore, the analysis assumed that full employment (887 employees) would be reached on the first day of the mining operation and would continue for 20 years. This appeared to be an unreasonable assumption. Also, the analysis did not evaluate "net" jobs or other economic considerations that could temper the overall benefits, including the loss of agriculture, tourism, recreation, etc. which already had begun prior to the application with surface land acquisition, would continue during the 20-year life of the mine, and would extend beyond the end of the 20 years. There was an indirect mention of the Emerald and Cumberland mines ["*existing mining operations affiliated with the Foundation Mine are approaching the end of their life*"], but the expected loss of jobs and revenues from those mines was not factored into the economic analysis (that is, any existing jobs lost at the other two mines which would be replaced at Foundation Mine would not result in a net increase in local employment).

> The economic analysis provided by the applicant to justify this project was disingenuous. Economic benefits were unrealistically inflated while costs were downplayed or ignored altogether.

☑ The economic analysis for Foundation Mine must be revised to reflect more realistic assumptions and employment trends consistent with the proposed plans.

(H) The applicant's impact summary (in Section 24.8) stated that the proposed NPDES discharges would meet State effluent limits and that they had been designed using Best Available Technology. All NPDES discharges, however, were not addressed in the 2010 mine application, including sanitary wastewater for the proposed bathhouse. There was no modeling of future water quality in the HQ receiving streams, and proffered baseline data were inadequate to support such modeling. The impact summary failed to note that the proposed discharges were associated with a mine that would use longwall extraction methods, and as such would have additional adverse impacts due to subsidence on Special Protection waters and wetlands across the entire underground mine permit area, impacts that likely would be significant and quite possibly permanent and that could be avoided by using room-and-pillar mining methods. The dewatering of a stream in Pennsylvania constitutes "pollution" in accordance with the Clean Streams Law, just as surely as a discharge containing high levels of acid, iron, sulfur, nitrogen, phosphorus, or other pollutants[12].

[12] Oley Township v. DEP and Wissahickon Spring Water, Inc., 1996 EHB 1098.

☑ Subsidence impacts on the Special Protection waters within the proposed Foundation Mine permit area associated with the use of longwall methods must be discussed.

(I) In its response in Section 24.8 "Impact Summary", the applicant stated:

> *The potential for the discharge to degrade water is further reduced as a consequence of Foundation Mine's customary diligence in implementing the design plan that has been developed. Foundation Mining, LLC has repeatedly demonstrated its sensitivity to environmental matters, and its reputation for sound and prudent mining practices is well-known in the coal mining industry of Pennsylvania.*

Inasmuch as Foundation Mining, LLC was a new corporate entity created exclusively for this proposed new mine, it had no established reputation (good or bad) of its own and thus had "repeatedly demonstrated" nothing at all. Its parent company, Alpha Natural Resources, however, had been responsible for permit violations at other mines during the previous 3 years that covered 151 pages (see Module 3), including 21 separate violations at its Pennsylvania mines totaling $32,770.50 in fines. The violations included exceedances of effluent discharge limitations, mining within the 100-foot buffer area without a variance, and failure to prevent material damage to the hydrologic balance. Alpha's recent violation history suggested that the statements quoted above were not credible. Furthermore, the Pennsylvania violations recounted in the 151-page listing were only those which were discovered by PADEP and were prosecuted as formal violations. Not included were hundreds of other violations of NPDES discharge limits that were included in monthly reports but never acted upon by PADEP[13].

During March 2014, Alpha Natural Resources entered into a consent decree with the US Environmental Protection Agency (EPA), US Department of Justice, and three states regarding violations of the federal Clean Water Act, specifically exceedances of water discharge permit limits. As part of the consent decree, Alpha agreed to spend an estimated $200 million on system-wide wastewater treatment system upgrades, and to pay $27.5 million in civil penalties to be divided among the federal government and state agencies.
http://www2.epa.gov/enforcement/alpha-natural-resources-inc-settlement

☑ The self-serving nature of the applicant's "justification", and the history of violations by its parent company, must be considered by the CDMO in evaluating whether there might be any degradation to these HQ waters as a

[13] In the Schmid & Company, Inc. (2010a) review of three longwall mines, approximately 500 irregularities were reported on the Discharge Monitoring Reports for nearby Emerald Mine between July 2007 and September 2009. On 2 January 2013, the Citizens Coal Council filed a lawsuit in the Federal District Court in Pittsburgh (Case 2:2013cv00003) against Emerald Coal Resources and Alpha Natural Resources for hundreds of self-reported violations of the Clean Water Act over a period of years

result of the proposed discharges. Past experience suggests that future violations and environmental damages by this applicant would be quite likely.

MODULE 28 - Blasting Plan

(A) The obsolete April 2001 version of this Module was used rather than the version revised September 2008 which was current at the time of this application.

☑ A current Module 28 must be completed and submitted.

(B) Section 28.3 noted that *"The following streams will be within 100 feet of blasting, Hoge Run, Unnamed Tributaries to Hoge Run, Unnamed Tributaries to House Run, Unnamed Tributary to Garner Run, and Unnamed Tributaries to McCourtney Run".*

☑ The implications for aquatic habitat (if any) of blasting within 100 feet of high quality streams must be addressed here or elsewhere in the application, and must be included in the applicant's request for variances.

MODULES NOT SUBMITTED

Every underground mine application does not necessarily need to address the information in every Module. The Foundation Mine application omitted the following nine Modules. At minimum, the five in **bold** should have been submitted, but were not.

Module 20 - Coal Refuse/Coal Ash - Sources and Properties
Module 21 - Coal Refuse Construction Plans
Module 25 - Coal Ash Beneficial Use
Module 26 - Remining of Areas with Preexisting Pollutional Discharges
Module 27 - Beneficial Use as a Soil Additive/Substitute
Module 29 - Disposal of Excess Spoil
Module 30 - Underground Disposal/Backstowing
Module 31 - In Situ Processing
Module 32 - Surface Site Stability

Module 20 and **Module 21** both are needed for coal refuse disposal activities, which inexplicably were not included in the 2010 State mine application. The applicant acknowledged in its 2012 federal 404 application that coal refuse disposal was needed for Foundation Mine to function economically, and identified the locations of two proposed coal refuse disposal areas (CRDAs). The 404 Application indicated that even without any expansion of the proposed underground mine beyond the initial 20 years, the operator also would have to develop a third CRDA capable of containing about 13 million cubic yards (roughly six years' worth) of coarse coal refuse and permanently demolishing approximately 58 acres of another High Quality stream valley.

Module 25 and Module 27 both involve projects where coal activity-related byproducts (coal ash, sewage sludge, etc.) will be reused or recycled in some way. There was no indication that there would be any such beneficial reuses associated with Foundation Mine, so these Modules appropriately were omitted.

Module 26 also was not necessary for the Foundation Mine application because this was a new mine and did not involve remining of any land previously disturbed by underground coal mining. Likewise, as there had been no previous surface mining here, the development of the surface facilities proposed at Foundation Mine would not involve the remining of abandoned surface mine land. Precisely because this area had not yet been contaminated or disturbed by previous coal mining, this Foundation Mine application deserved careful scrutiny.

As noted above, onsite coal refuse disposal was proposed in the 2012 federal 404 permit application for Foundation Mine, but not in the 2010 State underground mine application. Thus, **Module 29** should have been submitted with the State application to describe where the excess spoil would be placed that apparently was not proposed to be placed in onsite coal refuse disposal areas. Module 29 also should have been used to address the shortfall of about 13 million cubic yards of onsite refuse disposal capacity (and thus a need to dispose of that much more excess spoil) mentioned in the federal 404 permit application.

Module 30 is meant to be used where measures (such as backstowing) are proposed to reduce subsidence damage and surface waste in accordance with §89.142(a)(c)2 [see box below]. The three Act 54 Five-Year reports prepared to date demonstrate that longwall mining as currently practiced sometimes causes material damage to structures and other features, even beyond the setback distances presumed to provide adequate protection, and that such damage often is not

§89.142(a)(c)2:

(c) *Restrictions on underground mining*.

(2) The measures adopted by the operator to comply with paragraph (1) shall consist of one of the following:

(i) Providing a support area beneath the structure or surface feature to be protected where coal extraction is limited to 50%, ...

(ii) Backfilling or backstowing of voids.

(iii) Leaving areas in which no coal extraction will occur.

(iv) Taking measures on the surface to prevent material damage or reduction in the reasonably foreseeable use of the structure or feature.

(v) Demonstrating that the structure or feature will not be materially damaged through an engineering report or a report of the effects of mining under similar conditions.

(vi) Initiating a monitoring program within a specified area to detect surface movement resulting from the underground mining. The program shall entail placing monitors sufficiently in advance of the underground mining so that if excessive subsidence occurs the underground mining can be stopped before the protected structures or features are damaged. In calculating the area to be monitored, a 30° angle of draw shall be used.

adequately repaired. Thus, structures or features that were alleged to be appropriately protected from material damage in the Foundation Mine application in fact may not be. Hence this application, and every new or expanded application for longwall mining, should be required to incorporate either backstowing or one of the other measures listed at §89.142a(c)2 to minimize material damage to sensitive structures and features, as well as to reduce surface waste.

Module 31 is meant to be used if proposed activities will involve removal of coal or coal byproducts for in-place processing and energy generation. This apparently did not apply to Foundation Mine and so this Module appropriately was omitted.

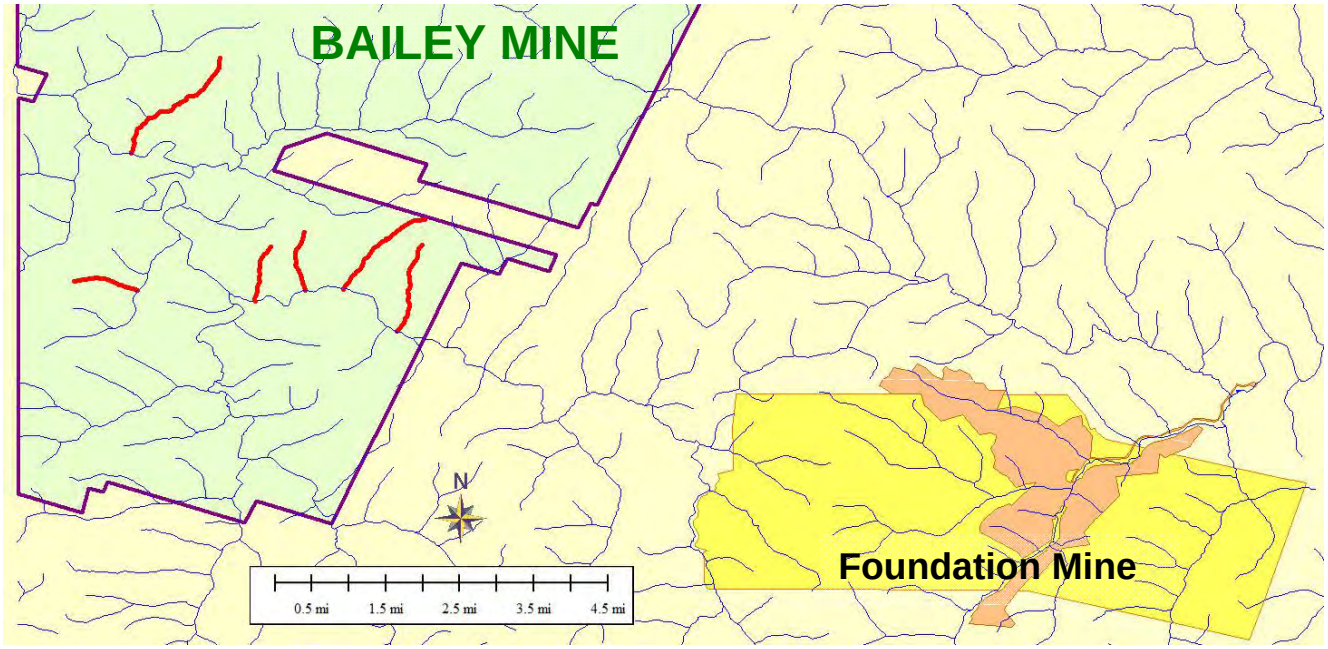
Module 32 is required in situations where slope failure from excavations, fills, soils, or spoil storage pile areas would pose a threat to mine openings, roadways, streams, mine facilities, or other surface features. Inasmuch as all of the proposed surface facilities and surface disturbances were in the vicinity of Exceptional Value or High Quality waters, the Foundation Mine facilities would pose a threat to sensitive, Special Protection streams if slope failure were to occur virtually anywhere. Thus Module 32 should have been completed.

APPENDIX B:

CDMO DETERMINATIONS OF IRREPARABLE DAMAGE TO STREAMS FROM LONGWALL MINING

During December 2012, the California District Mining Office (CDMO) issued two letters to Consol Energy Inc. regarding their ongoing restoration activities on six specific streams that had previously been undermined and dewatered by longwall mining at the Bailey Mine, located several miles west of the proposed Foundation Mine (see below). After repeated unsuccessful attempts by Consol over many years to restore flow to those six streams, the CDMO finally determined that the streams had not recovered and that further stream restoration work would be futile. The CDMO further determined that some (unspecified) type of alternative mitigation would be required to compensate for the damages caused to waters of the Commonwealth.

The two letters from the CDMO to Consol, both dated 27 December 2012, are included on the following pages.



Stream network in the vicinity of the proposed Foundation Mine (yellow is the proposed underground mine area, tan is the [larger] proposed surface facilities area per the 2012 Corps 404 application) in relation to the Bailey Mine, where 6 streams were determined by the CDMO to have been irreparably damaged (red).

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
CALIFORNIA DISTRICT MINING OFFICE

December 27, 2012

Mr. Josh Silvis
CONSOL Energy Inc.
CNX Center
1000 CONSOL Energy Drive
Canonsburg, PA 15317-6506

RE: Stream Restoration Unnamed Tributary 32596
CO&A and Amendment
Docket # 066008 and 076010

Dear Mr. Silvis;

The California Office Technical Staff, has completed the review of the stream flow information submitted by Consol and other relevant data assembled by the CDMO staff for Unnamed Tributary 32596. The attached report indicates that UT-32596 has not returned to normal stream flow conditions.

The Department hereby finds that the underground mining operations of Consol's Bailey Mine adversely affected the hydrologic balance of UT-32596 and although Consol has completed all the remediation efforts required by the September 19, 2007 COA and the Amendment of April 24, 2008, UT- 32596 has not been restored to conditions that existed prior to undermining. We feel any additional remediation activities on UT-32596 would be futile; therefore, we are requiring Consol to provide appropriate mitigation and/or compensation for the loss of Commonwealth resources. Please contact me at 724.769.1030 to set up a meeting to discuss your plans.

Please be advised that the Department may require the operator to file revised mining plans, or provide other data, to demonstrate that future underground mining operations will not result in a similar outcome to streams that are proposed to be undermined with full extraction mining.

Sincerely,

Wm. S. Plassio

FOR Gregory Prentice
Compliance Manager
District Mining Operations

Enclosure

California Technology Park, 25 Technology Drive, Coal Center, PA 15423
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pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
CALIFORNIA DISTRICT MINING OFFICE

December 27, 2012

Mr. Josh Silvis
CONSOL Energy Inc.
CNX Center
1000 CONSOL Energy Drive
Canonsburg, PA 15317-6506

RE: 2012 Annual Bailey Mine Stream Recovery Report
Bailey Global Consent Order & Agreement of June 11, 2008 and
Amendment of September 8, 2008
Docket # 086003

Dear Mr. Silvis;

The California Office technical staff has completed a review of Consol's 2012 Annual Report for the streams affected by Consol's underground mining activities at the Bailey Mine and for which remediation was required by the CO&A of June 11, 2008. Based upon our evaluation of the average non-flowing stream length percentages of control streams 32604, 32606, 32619, and 32620 and the non-flowing stream length percentages of the affected streams, we have concluded that undermined lengths of Polly Hollow, Unnamed Tributary 32511, Unnamed Tributary 32595, the Crows Nest and Unnamed Tributary 32534 have not recovered from the effects of underground mining activities of the Bailey Mine. I have enclosed a copy of our evaluation.

In reference to Paragraph 6 of the June 2008 CO&A; (1) Consol has performed various remediation efforts over the past 48 months on the affected streams. (2) The Department is unaware of any additional efforts that Consol could be required to take to remediate the affected streams. (3) The Department now requires Consol to perform compensatory mitigation or enhancement measures pursuant to Paragraph 7.

The Department recognizes, that previous correspondence allows for work on Unnamed Tributary 32511 to continue until May 2013; however, there have been no remediation efforts on this stream in the past 12 months. We are aware of negotiations between Consol and Mark McMillen for the purchase of all, or portions, of his property to allow for additional work. The company and landowner have indicated that these negotiations are tentative at best. We do not believe it is purposeful to delay the determination that the affected stream has not recovered and we will not require Consol to perform any additional remediation activities to UT-32511 at this time.

Please be advised that the Department may require the operator to file revised mining plans, or other data, to demonstrate that future underground mining operations will not result in a similar outcome to streams that are proposed to be undermined with full extraction mining.

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Mr. Josh Silvis **-2-** **December 27, 2012**

We wish to meet to discuss your plans for compensatory mitigation; please contact me at 724.769.1030 to set up an agreeable date and time

Sincerely,

Wm. S. Rlassio

FOR Gregory Prentice
Compliance Manager
District Mining Operations

Enclosure