

January 15, 2014

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Cc: Scott R. Perry
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Dear Mr. Summers, Mr. Lynch, and Colonel Jordan:

Thank you for your letter of August 12, 2013 in response to a letter (sent on July 17, 2013) by the undersigned and other organizations. In that letter, we requested that the Susquehanna River Basin Commission (SRBC) consider an investigation to determine whether Pennsylvania is complying with its obligations as a member jurisdiction to prohibit, control, and abate pollution of the Basin.

We appreciate your response regarding the need for sufficient “credible, factual evidence” in order for the Commission to consider initiating such an investigation. We also appreciate the detailed information on Pennsylvania’s regulatory program provided by Scott Perry of the Pennsylvania Department of Environmental Protection (DEP) in a letter dated July 19, 2013, as well as the interest by the agency in discussing their work and our concerns directly.

With both response letters in mind, we offer the following information about the aspects of DEP’s water quality program outlined in Mr. Perry’s letter. As discussed below, we are concerned not only with what is and is not codified in regulation—but also with the actual environmental impacts of shale gas development on the water resources of the Basin and whether sufficient action is being taken to prevent and address them.

We hope that the following discussion of environmental problems associated with shale gas development and specific regulatory issues apparent in Pennsylvania will be useful to SRBC officers and staff—particularly in New York and Maryland, member states that have not yet decided whether to proceed with shale gas development and are developing guidelines to protect against harm to the environment and public health.

Erosion and Sedimentation

Since legislative changes were enacted in 2005, the federal Clean Water Act has exempted most stormwater discharges associated with oil and gas construction activities from permitting requirements under the National Pollutant Discharge Elimination System (NPDES) program. As Mr. Perry noted, the DEP has established a state-specific regulatory program for such discharges under the Pennsylvania Clean Streams Law. The centerpiece of this program is the DEP's Erosion and Sediment Control General Permit for Earth Disturbance Associated with Oil and Gas Exploration, Production, Processing, or Treatment Operations or Transmission Facilities, or the ESCGP-2 permit. According to Mr. Perry, the DEP's program ensures that oil and gas construction activities will not pose a threat of pollution to waters of the Commonwealth.

For several reasons, however, this is not true. First, the DEP reviews applications for coverage under ESCGP-2 (and its predecessor, ESCGP-1) through an "expedited review process" that is too brief to allow agency staff to conduct meaningful technical reviews. For most projects, the DEP grants permit coverage within 14 business days as long as an application is deemed administratively complete and certified by a professional with proper credentials, such as a state-licensed engineer. For projects in special protection watersheds, on floodplains, and on contaminated brownfield sites, the DEP's review period is 43 business days.

Given the DEP's declining budget—50 percent over the last decade—and increasing workload during the shale gas boom, neither timeframe is long enough to allow for the meaningful technical review that an ESCGP-2 application associated with unconventional oil and gas production activities necessitates. Yet Governor Corbett's Executive Order 2012-11 directed the agency to process permit applications "as expeditiously as possible" and even made "compliance with the review deadlines a factor in any job performance evaluations." While timely decisionmaking may be a desirable goal, it should not come at the expense of staff diligence and, in turn, protection of the environment.

One example of the potential implications of hastened permit reviews for water quality is the Rexford well site in Bradford County. DEP files indicate that the agency approved an ESCGP-1 permit application after a 30-day review (in 2010). A few weeks later, a DEP inspector noted in a report that earth disturbance had occurred too close to a wetland and a tributary to Wysox Creek. Since the permit had already been issued, DEP "fixed" the situation by quickly issuing a stream distance waiver to the operator. (According to the DEP database, 60 such waivers were issued statewide in 2013 alone.) About one year after drilling began, the operator was cited with a violation of the Clean Streams Law due to stray gas pollution—raising the possibility that, with more careful review and oversight, such impacts could have been prevented. (It is notable that agency files indicate that staff were also concerned about the potential contamination of nearby drinking water wells.)

Second, the DEP's regulations fail, for oil and gas earth disturbance activities, to ensure that post-construction stormwater management Best Management Practices (PCSM BMPs) will work, because they exempt activities from PCSM analysis as long as the sites "require site restoration or reclamation" (25 Pa. Code 102.8(a)). This exemption assumes that if a site "requires restoration," the PCSM BMPs there will "use natural measures" that do not require "extensive construction or maintenance efforts."¹ However, this assumption is often not appropriate for oil and gas well sites because the "restoration" period includes long timeframes when wells are producing and sites are only partially restored. Moreover, the 9-month period that DEP allows for restoration does not begin until after the last well on a site is completed, which can be years from the time the pad is built. Further, under Act 13 of 2012, operators can request restoration extensions of up to two

years. Until the start of the restoration period, a well site need only be a “permanently stabilized” construction site.

The lack of PCSM analysis for these periods—during which large impervious areas that cause runoff exist—precludes an informed determination that PCSM BMPs will prevent increases in the volume and rate of stormwater runoff, or decreases in water quality. In his letter, Mr. Perry notes that “[a]ccording to section 102.8(f)(8), a PCSM plan must contain supporting calculations.” This is true, but calculations by themselves do not constitute analysis.

Mr. Perry also incorrectly states that “[f]or disturbed areas not restored to meadow in good condition, the PCSM/SR [site restoration] plan *must* include supporting calculations and analysis to demonstrate that there will be no increase in the peak rate of stormwater runoff for the 2,10, 50, and 100 year/24 hours storm events when compared to preconstruction conditions” (emphasis added). In fact, Pennsylvania law contains no such requirement. The DEP’s policy for erosion and sediment control at oil and gas sites states that for disturbed areas not restored to meadow in good condition, the PCSM/SR plan *should* include supporting calculations and analysis.² In reality, as evidenced by our review of ESCGP permit files, operators’ PCSM/SR plans often do not.

Equally troubling, the DEP’s regulations do not require a PCSM plan for projects under five acres in any form, since under 25 Pa. Code 102.8 such permits are required only for activities that require erosion and sedimentation control permits, rather than just plans. DEP’s approach here is flawed, because even smaller sites can pose a risk to water quality, particularly if there are many in one defined area, such as a watershed.

For example, less than six months after a permit was issued (in 2009) for the Vargson well site in Bradford County, a DEP inspector noted problems with the stabilization of soil embankments and a drainage ditch. A year later, a contractor knocked a hole in a wastewater pit to drain it, potentially polluting a nearby stream. In addition, when a compressor station was later added to the site, the project was permitted separately and considered too small (4 acres) to cause earth disturbance—even though the site would now in total far exceed the five-acre threshold for requiring an E&S control permit. This type of piecemeal segmentation disproportionately skews analysis of the true scope of impacts that can arise from earth disturbance activities associated with oil and gas development, particularly over time.

Third, the ESCGP-2 program does not have public participation requirements. Public notice is not published in the Pennsylvania Bulletin (or anywhere else) when an operator applies for coverage under ESCGP-2; notice is only provided when coverage is granted. Even when the public can discover an application for ESCGP-2 coverage prior to such belated notification, the DEP’s expedited review period makes it nearly impossible to meaningfully review an operator’s E&S and PCSM plans before the appeal deadline (30 days from the date of Bulletin publication).

Finally, although the 2012 Pennsylvania Oil and Gas Act requires that well sites be restored after the last well on the site is plugged, the DEP does not require the submission of a final restoration *plan* unless the operator requests an extension of the restoration period, and DEP does not enforce final restoration through ESCGP-2. The DEP’s regulations and ESCGP-2 allow operators to terminate permit coverage after PCSM BMPs are in place for the production period—when a well site is only partially restored—and at the same time allows for a transfer of responsibility regarding long-term maintenance of the BMPs to third parties (e.g., landowners who are likely to lack the expertise for such maintenance). These flaws in Pennsylvania’s Erosion and Sedimentation control programs illustrate the need for an independent, comprehensive review of water quality control measures by the Commission, which relies on the state’s program to safeguard much of the Basin.

Water withdrawals

Water withdrawal requirements for shale gas operators in Pennsylvania are likely not fulfilling basic anti-degradation strictures of the federal Clean Water Act. Mr. Perry has stated that, as part of reviews for state-required obstruction and encroachment permits, DEP ensures that the project will not degrade water quality. To support this statement, Mr. Perry references 25 Pa. Code § 105.14(b)(11), which requires DEP to make a determination of impact by using the factor of “consistency with state anti-degradation requirements.”

However, Mr. Perry only references a regulation that may or may not be followed; he does not provide evidence that procedures and analyses are actually performed to support a finding of “consistency.” We have evidence that they may, in fact, not be performed at all.

For example, in 2012 DEP approved a permit for Anadarko E&P to construct a surface water withdrawal and waterline on the Lycoming Creek, a waterway designated as a Cold Water Fishery (for trout) in an Exceptional Value watershed located in Lycoming County. The agency’s record of decision affirms the possibility of “cumulative impacts (temporary and permanent).” However, the record does not include any information regarding how those impacts would be avoided or mitigated, nor any evidence that DEP conducted an anti-degradation analysis. In recommending approval of the permit, the DEP reviewer simply wrote down a qualified statement: “If the approved erosion and sedimentation control plan and plans included with this permit application are properly implemented, and permit conditions are followed, this project will meet Chapter 105 Environmental Requirements and should not have a significant adverse environmental impact on stream or wetland resources.”

In short, the DEP failed to perform an actual, substantive analysis, such as a written assessment of a project proposal’s qualitative impacts on a receiving waterbody’s designated and existing uses. The agency thereby violated the unambiguous requirement of 40 C.F.R. 131.12 for states to perform anti-degradation reviews before authorizing new projects that may cause or contribute to a violation of water quality standards.

Mr. Perry also quotes Section 3211(m)(3)(i) of the 2012 Oil and Gas Act, which codifies a presumption of compliance with water quality standards (in the context of a water withdrawal for shale gas operations) if the water withdrawal in question has “been approved by and is operated in accordance with conditions established by the Susquehanna River Basin Commission....” This reinforces our concern that actual anti-degradation analyses are not being performed, especially since the SRBC has stated in numerous public settings, and codified in its regulations, that it *does not review potential impacts on water quality of a withdrawal or associated infrastructure on a receiving water body*. If DEP is relying on the SRBC conditions, and the SRBC does not specifically consider quality impacts when approving water withdrawals, the only logical conclusion is that Section 3211(m)(3)(i) of the 2012 Oil and Gas Act impermissibly exempts Pennsylvania from performing anti-degradation reviews for water withdrawals in the Basin.

It is also unfounded for Mr. Perry to rely on DEP’s requirement that oil and gas operators develop a Water Management Plan (WMP) as evidence that Pennsylvania fulfills its anti-degradation duties. That plan requires a permit applicant to identify designated and existing water uses at the proposed withdrawal location and provide a withdrawal impact analysis narrative on a specific DEP form (known as an OOGM0087). If potential impacts are identified, the applicant is to describe methods for avoiding or mitigating them in order to protect and maintain the other uses of that water source.

However, identification of potential water quality impacts by the permit applicant is not the same as the state performing required anti-degradation reviews. It is unlikely that an applicant would propose the kind of stringent, scientifically based avoidance or mitigation measures that the state would require to maintain a receiving waterbody's quality. Because the primary interest of applicants is to obtain sufficient volumes of water for its projects from convenient locations, they have an incentive to *not* identify a potential water quality issues, and then to skew any proposed measures in order to minimize economic expenditures. It is the state's duty to gather information on any action that could violate water quality standards, or to cumulatively assess available information in a rational manner, and to produce a finding based on such independent reviews.

In sum, Mr. Perry's response makes clear that Pennsylvania's review of water withdrawals for shale gas operations may be less about anti-degradation analyses and implementing appropriate protective measures, and more about ensuring a proper paperwork trail from operators. This appears to also be the case with regard to water withdrawal permits that are entered on the SRBC's action item docket. Simply put, assuming the performance of anti-degradation duties without proof of implementation and actual analysis by the state is akin to willful ignorance and certainly doesn't fulfill the intent and spirit of the Clean Water Act, codified in 40 C.F.R. 131.12 et seq.

Centralized wastewater impoundments

As Mr. Perry indicates, operators must obtain a Centralized Impoundment for Oil and Gas Wells Permit based on construction, siting, and maintenance standards (detailed on DEP form OOGM-0084). However, the types and characteristics of waste (e.g., toxicity or radioactivity) that can be placed in the impoundment are not specified, nor subject to any regulations beyond those applicable to standard residual wastes.

Upcoming revisions to Chapter 78 of Pennsylvania's Oil and Gas Act could eventually include new requirements for the temporary storage of waste and use of centralized impoundments. During the public review and comment period this winter, stakeholders will examine whether proposed changes will be sufficient to prevent spills, leaks, liner tears, and other causes of surface and ground water pollution.

It is important to note that concerns regarding the handling of waste go beyond centralized impoundments. In 2013, the State Review of Oil and Natural Gas Environmental Regulations (STRONGER) Board determined that while Pennsylvania has adequate regulations in place for centralized impoundments, the state's continued use of production pits poses significant environmental problems. According to Finding III.4 of the STRONGER report, "the DEP's experience with pits has shown that, although their use is decreasing, many liner failures still occur with pits and other types of waste are being dumped into pits." STRONGER recommended that DEP "consider adopting regulations or incentives for alternatives to pits used for unconventional wells in order to prevent the threat of pollution to the waters of the Commonwealth."

Pennsylvania not only allows operators to store residual waste in pits at well sites, but to then bury it onsite, potentially posing risks to groundwater over time (a practice that Chapter 78 revisions proposed by DEP would continue to allow). Regulation (Chapter 78.62) requires pits to be structurally sound and impermeable and buried waste to be solidified and below certain toxicity thresholds. However, review of dozens of well files at DEP regional offices did not find any evidence that DEP inspectors are present at the time of pit burial to ensure that these criteria are met. DEP has confirmed that it does not require operators to perform chemical analysis of waste prior to burial in every instance, nor does the agency keep track of the location or number of buried waste pits. In addition, the requirement that buried pits be only 20 inches above the seasonal high water table gambles with local water quality since Pennsylvania has many shallow groundwater sources.

(Note that other states require far greater distances, such as 25 feet in New Mexico, 5 feet in Louisiana, and 4 feet in Michigan.)

DEP also issues waivers to Chapter 78 regulations through the OG-71 authorization, as long as operators can demonstrate that their alternative methods of waste management provide “equivalent or superior protection.” However, there is no evidence that DEP is taking steps to ensure that such practices protect water quality to a degree “equivalent or superior” to Chapter 78 regulations. In fact, review of DEP well files indicates that regulatory waivers have often been issued for burial of solid waste in riparian areas, including Exceptional Value watersheds.

Freshwater impoundments and processed wastewater

As Mr. Perry points out, Pennsylvania encourages the reuse of flowback fluid. However, a recent study found that reuse and recycling currently makes up only 14 percent of the water used by drillers in Pennsylvania (based on data provided by the Susquehanna River Basin Commission).³ Reuse is therefore highly unlikely to be a solution to the waste disposal and water needs of the industry going forward, particularly if drilling continues to expand. As is the case for all oil and gas states, Pennsylvania is increasingly challenged to regulate shale gas-related waste as more wells are drilled; analysis of data from DEP and operator reports indicates an almost 70 percent increase in waste generated from 2010 to 2011.⁴

Mr. Perry also states that permit standards for wastewater storage in freshwater impoundments “are so stringent that the wastewater is essentially distilled and incapable of causing water quality problems in groundwater or surface water.” This would certainly be an ideal situation, yet it is unclear that permit conditions actually ensure that those standards are met or will continue to be met once an impoundment has been in use for some time.

DEP has acknowledged that gas field wastewater remains contaminated after it leaves the well site. In 2010, the agency issued more stringent standards for the treatment of Total Dissolved Solids (TDS) by treatment plants, in part to reduce bromide loads in surface waters. But because the problem persisted, DEP issued a *voluntary request* in 2011 to operators to not take wastewater to municipal treatment plants. To date, DEP has refused to adopt new, binding standards for TDS, chlorides, and sulfates or to *prohibit* operators from using municipal wastewater treatment plants for gas field waste disposal.

Without a real solution, there will continue to be widespread ramifications for Pennsylvania’s waterways, as more than 50 percent of waste generated from Marcellus Shale wells in the state is discharged to surface waters after treatment at industrial waste or municipal sewage plants.⁵ In 2012, a DEP investigation found chloride, bromide, lithium, strontium, radium-226, and radium-228 just downstream of a treatment plant’s discharge to the Allegheny River and that pollutants were building up in the river bed; the agency concluded that the wastewater discharges are “harmful to the water uses and aquatic life...”⁶ Following a federal lawsuit by Clean Water Action, DEP recently took enforcement action, although the treatment plant has been given two years to adopt better waste treatment technology.

In the meantime, a 2013 study by Duke University found high levels of radium, salts, bromide, and metals in a stream below a different wastewater discharge site in western Pennsylvania.⁷ While it is difficult to say with certainty how many waterways in Pennsylvania are being degraded by shale gas waste, evidence indicates that as long as gas operators are allowed to discharge polluting substances, water quality will be at risk.

Road-spreading of brine

Drilling and hydraulically fracturing for oil and gas creates tremendous volumes of brines and other liquid waste that must be disposed of safely. Brine spread on roadways makes its way, through stormwater runoff, into nearby waterways or wetlands. Brine from both conventional and unconventional wells have the potential to push salinity loads far above any naturally occurring conditions.

In Pennsylvania, oil and gas well brines are considered to be “residual waste” under the state’s Solid Waste Management Act. As Mr. Perry states, Pennsylvania has adopted regulations (set forth at 25 Pa. Code Chapter 287) that establish a process whereby residual wastes can be approved for “beneficial uses,” such as road-spreading for dust suppression purposes, if the wastes and uses meet certain conditions. Among other things, the wastes must, as a class, have the same or substantially similar chemical composition, and it must be possible for the DEP to regulate them using standardized conditions “without presenting a threat of harm to the health, safety, or welfare of the people or environment of the Commonwealth” (25 Pa. Code 287.601(a)).

Currently, however, the DEP allows brines from conventional gas wells to be used for dust suppression even though this beneficial use has never been approved under Chapter 287. In an attempt to rectify this incongruity, in 2011 the DEP issued a notice for public comment on a beneficial use general permit (WMGR064) that would have allowed gas well brines to be used both for dust suppression and de-icing purposes.

Due to public concerns over health and water quality impacts, this permit was never issued. Now, the DEP’s proposed revisions to Chapter 78 oil and gas regulations would allow brine to be used for both dust suppression and de-icing—precisely what was attempted with the failed WMGR064 permit. Adoption of these revisions would be unlawful, however, because they would establish a “permit-by-rule” approval process, and Chapter 287 does not allow new permit-by-rule approvals for beneficial uses. The DEP, however, appears determined to allow brines to be spread on roads without complying with the safeguards set forth in Chapter 287.

These concerns about Pennsylvania’s brine beneficial re-use controls lend further credence to our concern over the state’s ability to safeguard water quality in the Susquehanna River Basin—particularly in light of Pennsylvania’s lacking scientific diligence in administering its brine re-use program.

Pipelines

Mr. Perry claims that DEP’s regulation of pipelines that cross streams provide protection against pollution and ensure that Chapter 105 standards are met. As detailed below, this claim is not supported by facts on the ground. Further, Mr. Perry neglects to mention other areas of regulation regarding pipelines for which DEP is responsible, including erosion and sedimentation controls under Chapter 102.

In addition, Chapter 105 has shortcomings that are exploited by the oil and gas industry. For example, permit requirements are waived for all construction activities (including filling) in the headwaters of streams if the drainage area is less than 100 acres—even in Special Protection watersheds. While most oil and gas pipelines currently must be approved by a Chapter 105 individual permit, DEP often elects to waive the requirements for environmental assessment and alternatives analysis. For example, this occurred with the water line application from Benspond to Brule in Sullivan County, which crossed Exceptional Value streams.

One example of DEP's failure to prevent pollution from pipeline construction is the Tennessee Gas Pipeline's (TGP) 300 Line Upgrade project built in 2011-12. The project encompasses many streams classified as Exceptional Value or High Quality and many Exceptional Quality wetlands, and is characterized by steep slopes, natural vegetation that includes mature forest, and intact habitats for diverse wildlife, including threatened and endangered species. These characteristics are verified in the Pike County Conservation District (PCCD) reports on the project.⁸

During the course of the project, PCCD issued no fewer than 21 Notices of Violation to TGP. In addition, in 28 out of the 38 "Environmental Compliance Monitoring Program Weekly Summary Report(s)" that were noticed on the Federal Energy Regulatory Commission's (FERC) website, there was at least one recorded incident during which construction activity did not come into "compliance with project specifications, mitigation measures, and applicable FERC-approved Project plans." Additionally, out of 16 inspections conducted by the Wayne County Conservation District during construction of the 300 Line Upgrade project, 15 violations were found; in other words, a 93 percent failure rate.⁹

These transgressions resulted in numerous instances of construction materials and sediment being discharged into water bodies, violations for worksite conditions, and repeated failures to properly institute Best Management Practices for erosion and sediment control. It is especially notable that even after being presented with evidence of systemic compliance failures, DEP issued an ESCGP-1 for the TGP Northeast Upgrade project (which connects the sections of the 300 Line and comprises many of the same subwatersheds), as well as Water Obstruction and Encroachment permits for Wayne and Pike Counties. Furthermore, expert input from the PCCD regarding technical deficiencies in both the ESCGP-1 and the Water Obstruction and Encroachment permit applications for the Northeast Upgrade Project went unheeded.¹⁰

Similarly, DEP delayed any action based on the permit violations caused by the 300 Line construction, indicating that the agency conducts a review of permit violations *after construction of a project is complete*. This is in direct contradiction to Section 18 of ESCGP-1, which states that "any permit non-compliance...is grounds for enforcement action or permit suspension; revocation, modification, and reissuance, or denial of a permit." It was only after a full year that DEP finally started to take enforcement action against TGP (in November 2012) and, according to a local media report, began to review between "500 and 600 violations" that TGP had accrued.¹¹

This example illustrates the failure of DEP to act *to prevent* ongoing harm to water resources and the environment arising from shale gas operations in the Susquehanna Basin and is a significant failure of the agency's water protection mandate. DEP issued permits despite glaring deficiencies under Chapter 102 and Chapter 105, exposing many of the same subwatersheds that the 300 Line had harmed to continuing adverse impacts. In sum, DEP's regulation of pipelines does not prevent pollution and, based on performance in the field, can result in direct harm to water resources.

Despite these considerations, in November 2013, DEP published notice in the Pennsylvania Bulletin of its proposal to significantly modify the Chapter 105 General Permit 8 (GP-8). Currently authorizing only temporary road crossings of streams and wetlands, the proposed expanded permit would authorize the construction and removal of temporary pipelines that could remain in place for up to two years. It would also allow large-capacity (up to 24 inches in diameter) pipelines to carry "pollutional materials," a term that is not defined but presumably would include fracturing and flowback fluids.

The proposed GP-8 would allow pipelines to be constructed through an unlimited number of wetlands and streams, including Exceptional Value waters, with no restrictions on the length or

area of wetland or stream impacts. Like all General Permit registrations, GP-8 activities would not be published in the Pennsylvania Bulletin, thus greatly reducing the opportunity for public review and input. As discussed above with regard to erosion and sedimentation controls, the proposed GP-8 seems intended to satisfy industry's wish for expedited approvals at the expense of water resource protection.

Also in November 2013, notice was issued of Pennant Midstream, LLC's application for Chapter 105 Individual encroachment permits to construct and maintain 33 miles of natural gas lines across Lawrence and Mercer counties. Among the 170 identified impacts to wetlands and streams are 64 temporary stream impacts totaling more than 7,400 linear feet and 66 temporary wetland impacts totaling 7.5 acres—all of which could fall under the "temporary" allowances of the proposed GP-8 permit.

Bonding

As Mr. Perry indicates, the 2012 Pennsylvania Oil and Gas Act recently increased bonding amounts for oil and gas wells, most significantly for deeper wells. We greatly appreciate this change and the work of the DEP to bring it about. However, we believe that given the problems occurring at well sites statewide, even these higher levels do not provide necessary financial assurances.

Time and again, the cost of reclaiming abandoned and orphan wells has exceeded the bonding levels required under state and federal laws.¹² This suggests that Pennsylvania's bonding levels will fall short of being enough to pay for the potential costs of a "worst case" scenario—when an operator walks away and the state is left to deal with problems such as well integrity failure and methane leaks.

Currently, DEP has identified more than 8,600 abandoned and orphaned wells statewide that remain unplugged (compared to about 3,500 that DEP has successfully located and plugged).¹³ DEP staff are on record as estimating that the location and condition of 200,000 wells remains unknown.¹⁴ Concerned citizens and organizations have identified bonding as an immediate issue for action by DEP during the pending Chapter 78 regulatory revisions, which could eventually enhance requirements for operators to identify abandoned wells in the vicinity of a new well. This is critical because drilling through them can open up new pathways for chemicals and methane and potentially contaminate water supplies.

Additionally, the use of blanket bonds—currently set at between \$35,000 and \$600,000 for unconventional drilling depending on well depth and number—allows operators with many wells to pay a dramatically reduced amount of financial assurance per well. This can leave taxpayers exposed to significant costs for environmental clean-up. In 2001, for example, the bankruptcy of an oil producer in Wyoming left the federal and state governments liable for more than \$3 million in estimated cleanup costs for 120 wells.¹⁵ The producer's use of a blanket bond dramatically reduced the amount of financial assurance it was required to provide and shifted liability for the cost of cleanup to the state's conservation fund when the company failed. As stated in a recent study of well site reclamation, "a bond of \$2500 is inadequate to cover the costs to plug a deep shale gas well and restore the land (approximately 100-700 thousand dollars). The inadequacy of the blanket bond is even more pronounced, as many operators are expected to drill thousands of wells."¹⁶

Finally, Pennsylvania requires financial assurance only for the costs of plugging a well and reclaiming the site, and releases the bond one year after these steps have been taken. However, releasing bonds so quickly provides the public with little assurance of proper site reclamation, let alone protection against the costs of addressing damage to water supplies, natural resources, property, or health—impacts that may become apparent only over a prolonged period of time.

Enforcement

Mr. Perry criticizes reports on industry oversight and enforcement by Clean Water Action and Earthworks as “fundamentally flawed.” Yet both organizations based their findings on DEP data that is currently available to the public. Our organizations have been strong proponents of increased funding for DEP so that agency staff can perform its work more effectively in the face of the shale gas boom—including through increased inspections to prevent environmental damage and enforcement actions to ensure that operators are held accountable.

It may well be true that many wells operate without significant problems, but it is equally true that equipment failure and operator mistakes are an inevitable part of all phases of the gas development process. We strongly disagree with Mr. Perry’s assertion that inspections should focus on the site development and drilling phases since “once a well is in production...it is essentially a static operation.”

As noted above with regard to orphaned and abandoned wells, problems can occur years after drilling. A 2012 study based on a review of DEP’s inspection and violation databases indicates that 6-7 percent of gas wells in Pennsylvania have compromised structural integrity, primarily casing failures, within three years of being drilled; preliminary data from a study update indicate increasing rates of structural integrity problems over time.¹⁷ Industry acknowledges the challenges of maintaining proper well construction,¹⁸ as did DEP when it updated casing and cementing regulations in 2011.

When DEP inspections do take place, they often turn up significant problems—precisely the reason why we are so concerned about gaps in oversight. For example, a spill of hydrochloric acid that polluted a pond at the Vannoy well site in Bradford County (in 2009) occurred four months after the well was completed; DEP found the violation while responding to a homeowner complaint. At the Postell well site in the same area, a flowback spill occurred when a separator failed four months after the well was completed; a call from the operator prompted an inspection that eventually led to extensive soil remediation. And in a well-publicized case, XTO Energy’s release of toxic wastewater into a tributary of the Susquehanna River was only discovered during a DEP inspection—one of 13 Environmental Health and Safety violations in less than two years at the site, including for a structurally unsound waste impoundment and faulty cement casing.¹⁹

Mr. Perry also asserts that analysis of enforcement problems should focus only on unconventional (Marcellus shale) wells. However, conventional wells also are hydraulically fractured, generate waste, and subject to the same operational issues. The Earthworks report considered all active wells in its inspection figures on the basis that as long as activity is underway at a site, DEP has an obligation to oversee it. It is also worth noting that when DEP wrote its recommended inspection policy in 1989, which is still the foundation for current inspection policies, unconventional shale gas wells did not even exist.

Finally, it is questionable whether current fines are sufficient to have a deterrent effect, since many operators are “repeat offenders” that incur increasing numbers of violations over time. We also remain concerned about DEP’s inconsistency in taking enforcement actions for violations that directly threaten water quality, such as improper waste containment and disposal and discharge of polluting substances. Such events are not mere administrative problems; even if an operator resolves the source of a problem, damage has already occurred that must be addressed.

The above discussion pinpoints many concerns that our organizations have expressed more generally to the Commission in previous letters and statements. Indeed, the facts and analysis of Pennsylvania's administration of environmental controls provided here support our longstanding call for the SRBC to conduct a comprehensive cumulative impacts analysis—one that considers the effects of shale gas development on *both* water quantity and quality. It is critical that SRBC takes the necessary initiative to assess these impacts on the Susquehanna River Basin and the ability of member states to prevent them. As more wells and infrastructure associated with gas development are built, and further water withdrawals are needed, the scope and severity of environmental risk will only increase.

We respectfully remind the Commission that it is well within the mandate of the SRBC Compact to ensure that member states, such as Pennsylvania, are adequately implementing their quality controls and taking the action necessary to “prevent, reduce, control, and eliminate water pollution and to maintain water quality.”²⁰ Doing so is essential to protecting the shared, public water resources of the Susquehanna Basin and beyond.

We would welcome the opportunity to discuss these issues further. Please direct any questions to Guy Alsentzer, Lower Susquehanna Riverkeeper (406-570-2202; guy@lowsusriverkeeper.org) and Nadia Steinzor, Earthworks (202-887-1872, ext. 109; nsteinzor@earthworksaction.org).

Thank you for your time and consideration.

Sincerely,

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Kate Sinding, Senior Attorney and Deputy Director, New York Program, Natural Resources Defense Council

Kristen Cevoli
Clean Water Advocate, PennEnvironment

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- ¹ DEP Comment and Response Document regarding August 21, 2010 amendments to 25 Pa. Code Chapter 102, 40 Pa.B. 4861, available at http://files.dep.state.pa.us/water/BNPNSM/StormwaterManagement/Comment_Response_Document.pdf
- ² Policy for NPDES Permits for Stormwater Discharges Associated with Construction Activities at Oil and Gas Wells, Document No. 550-2100-008, available at www.elibrary.dep.state.pa.us/dsweb/Get/Document-48245/01%20550-2100-008.pdf.
- ³ E. Hansen, D. Mulvaney, and M. Betcher. *Water Resource Reporting and Water Footprint from Marcellus Shale Development in West Virginia and Pennsylvania*. Downstream Strategies and San Jose University, 2013
- ⁴ Ibid.
- ⁵ Ibid.
- ⁶ Consent Decree, PA Department of Environmental Protection v. Waste Treatment Corporation. Filed in the Commonwealth Court of Pennsylvania, November 25, 2013.
- ⁷ N.R. Warner, C.A. Christie, R.B. Jackson, A. Vengosh "Impacts of Shale Gas Wastewater Disposal on Water Quality in Western Pennsylvania." *Environmental Science & Technology*, 2013.
- ⁸ Email letter dated March 15, 2012 from Ellen Enslin, Pike County Conservation District to Kevin White, DEP re: Tennessee Gas Pipeline-Northeast Upgrade Project (TGP_NEUP) Chapter 105 Permit for TGP-NEUP.
- ⁹ The Delaware Riverkeeper Network et al v. Commonwealth of Pennsylvania, DEP and TGP, 12.18.12
- ¹⁰ Letters dated September 5, 2012, October 18, 2012, and November 21, 2012 from Pike County Conservation District to PA DEP Northeast Regional Office re: Technical Review ESCGP-1 Application #02001181.
- ¹¹ Beth Brelje, *DEP, Tennessee Gas continues talks about fines*, POCONO RECORD, Nov. 27, 2012, http://www.poconorecord.com/apps/pbcs.dll/article?AID/20121127/NEWS_/211270320/-1/rss01 (reporting statements made by Colleen Connolly).
- ¹² T. Dutzik, B. Davis, T. Van Heeke, J. Rumpfer. *Who Pays the Cost of Fracking*. PennEnvironment Research & Policy Center, 2013 (p. 27).
- ¹³ As of December 5, 2013. See PA DEP, Office of Oil and Gas Management, Orphaned and Abandoned Well database. http://www.depreportingservices.state.pa.us/ReportServer/Pages/ReportViewer.aspx?/Oil_Gas/Abandoned_Orphan_Web
- ¹⁴ Scott Detrow. "Perilous Pathways: Behind The Staggering Number Of Abandoned Wells In Pennsylvania." *State Impact*, October 10, 2012.
- ¹⁵ Western Organization of Resource Councils. *Filling the Gaps: How to Improve Oil and Gas Reclamation and Reduce Taxpayer Liability*, August 2005
- ¹⁶ A.L. Mitchell and E.A. Casman. "Economic Incentives and Regulatory Framework for Shale Gas Well Site Reclamation in Pennsylvania." *Environmental Science & Technology*, 2011.
- ¹⁷ A.I. Ingrassia. "Fluid Migration Mechanisms Due to Faulty Well Design and/or Construction: An Overview and Recent Experiences in the Pennsylvania Marcellus Play." Physicians, Scientists, and Engineers for Healthy Energy, 2012.
- ¹⁸ See the Society of Petroleum Engineers well integrity conference schedule: <http://www.spe.org/events/13abn4/pages/schedule/index.php>; and G.E. King and D.E. King. "Environmental Risk Arising From Well-Construction Failure--Differences Between Barrier and Well Failure, and Estimates of Failure Frequency Across Common Well Types, Locations, and Well Age." *SPE Production and Operations*, 2013.
- ¹⁹ Review of the Marquardt well site, Lycoming County, records in PA DEP's Efacts database and State Impact "Shale Play" website (<http://stateimpact.npr.org/pennsylvania/drilling/wells/081-20294/>).
- ²⁰ SRBC Compact, Article 5, Section 5.2(a).