



April 12, 2010

Via Electronic Mail

Paula.Schmitt@drbc.state.nj.us

Commission Secretary

DRBC

25 State Police Drive

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West Trenton, NJ 08628-0360

**Re: Public Comment – Stone Energy Dockets
(Nos. D-2009-013-1 and D-2009-018-1)**

Dear Ms. Schmitt and Commissioners:

We submit the following comments on behalf of Delaware Riverkeeper Network (“DRN”) regarding Draft Dockets, D-2009-013-1 (water withdrawal), and D-2009-018-1 (natural gas well drilling pad site). DRN proposes that the Delaware River Basin Commission (the Commission) not approve the above-referenced Draft Dockets.

As noted in the Proposed Dockets, D-2009-13-1 is for the withdrawal of up to 21.0 mg/30 days (.70 million gallons of water per day) from the West Branch of the Lackawaxen River in Mount Pleasant Township, Wayne County, PA, near Hankins Pond. The water would be used by Stone for shale gas extraction and development, primarily for hydraulic fracturing, of their gas wells.

D-2009-18-1 is for shale gas well “M1” (known as the Matoushek well) in Clinton Township, Wayne County, between Johnson Creek and Cramer Creek in Aldenville in the West Branch of the Lackawaxen Creek Watershed, downstream from the proposed water withdrawal and just upstream of the Aldenville Gauge at Creamton (see photo #1). This well, with a target formation of Marcellus Shale, was drilled by Stone in 2008 without first obtaining approval from DRBC. Pennsylvania Department of Environmental Protection (PADEP) permit number is 37-127-20006-00 issued 04/14/2008. The projects are located in Special Protection Waters of the Upper Delaware River.

Procedural Concerns

Stone Energy’s initial application did not contain all of the exhibits required by Rule of Practice and Procedure (R.P.P.) Sec. 2.3.8(B), though the application has been supplemented with

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several of these exhibits. It appears that Stone Energy may have failed to fully comply with Requirement 7, an “estimate of the cost of completing the proposed project, and sufficient data to indicate a workable financial plan under which the project will be carried out.”¹ The Draft Docket(s) provides an estimated project cost, but it does not provide details as to the source of the cost or the financial plan for the Draft Docket(s). It also appears that Stone Energy may have failed to fully comply with Requirement 8, for “analyses and conclusions of regional water supply and wastewater investigations.” This requirement will be discussed *infra*.

Basin Impacts

Section 3.8 of the DRB Compact states that “No project having a substantial effect on the water resources of the basin shall hereafter be undertaken by any person, corporation or governmental authority unless it shall have been first submitted to and approved by the commission...” Several DRBC regulations incorporate the mandate that permit applicants address the impact of their proposed projects on the Basin. For example, R.P.P. Sec. 2.3.7(A) states that “[a]pplications before the Commission should address the impact of the withdrawal, use and disposal of water on the water resources of the Basin.” These impacts have not been adequately discussed, leading us to believe that the application is substantively deficient.

Out of Basin Transfer

First, while Stone Energy avers that the water use is “100% consumptive,” the project also entails transfers out of the Delaware River basin. The two uses are not mutually exclusive. Consumptive use is “loss of water from a groundwater or surface water source through a manmade conveyance system . . . due to transpiration by vegetation, incorporation into products during their manufacture, evaporation, diversion out of a basin or any other process to the extent that the water withdrawn is not returned to the waters of a basin.” An out-of-basin transfer is “an exportation of water [] taken from within the Delaware River Basin and transferred and conveyed to an area outside the drainage area of the Delaware River and its tributaries, including the Delaware Bay, and not returned to the Delaware River Basin.” Water Code (W.C.) Sec. 2.30.1. It is a form of consumptive use.

Stone Energy’s application materials and correspondence with DRBC also make clear that wastewater will be processed and discharged in locations outside of the Delaware River Basin and that this amounts to an out-of-basin transfer.

Since the Stone Energy project entails a transfer out of the Delaware River Basin, W.C. Sec. 2.30 and subsections are applicable.

W.C. Sec. 2.30.4 requires Stone Energy to address eight issues:

- A. Efforts to first develop or use and conserve the resources outside of the Delaware River Basin.
- B. Water resource impacts of each alternative available including the “no project” alternative.
- C. Economic and social impacts of the importation or exportation and each of the available alternatives including the “no project” alternative.
- D. Amount, timing and duration of the proposed transfer and its relationship to passing flow requirements and other hydrologic conditions in the Basin, and impact on instream uses and downstream waste assimilation capacity.

¹ The initial application contained a general breakdown of costs, which, upon information and belief, was deemed insufficient by DRBC, and, upon information and belief, has not been adequately supplemented.

E. Benefits that may accrue to the Delaware River Basin as a result of the proposed transfer.

F. Volume of the transfer and its relationship to other specified actions or Resolutions by the Commission.

G. Volume of the transfer and the relationship of that quantity to all other diversions.

H. Any other significant benefit or impairment which might be incurred to the Delaware River Basin as a result of the proposed transfer.

Upon information and belief, no such information was provided to DRBC by the applicant. There is no statement regarding Stone Energy's efforts, if any, to use resources from outside the Basin in its project. No documents in the application file address the "no project" alternative, as required by sections B and C. Impacts on downstream uses have not been adequately addressed. The significant benefits and impairments the project may cause have not been presented.

W.C. Sec. 2.30.3 "Safeguard Public Interest" requires "review and consideration of any public or private project involving the importation or exportation of water [to] be conducted pursuant to this policy and shall include assessments of the water resource and economic impacts of the project and of all alternatives to any water exportation or wastewater importation project."²

The Draft Docket(s) contain no such determination, and indeed, this project cannot be determined to be in the public interest on the information currently available. Stone Energy has not proven that its projects meet all the criteria listed above, so the Commission *must* fully weigh the impacts of the project and find it to be in the public interest if a permit is to issue.

No long-term economic impact studies have been performed in the West Branch Lackawaxen River (WBLR) area. A projection based on the Barnett Shale project in Texas, which was written by Timothy W. Kelsey of the Penn State Cooperative Extension,³ posits that "[u]nder current [Pennsylvania] law, natural gas will not significantly increase the local tax base, and thus local tax revenues" because natural gas is not subject to local taxation. The costs borne by local governments and school districts, while not specified, are nevertheless deemed "significant." Kelsey acknowledges that there are "opportunities and benefits for the construction industry, retail trade, and others" but that "[t]he size of these economic impacts . . . depend critically upon whether such businesses exist within the Pennsylvania communities affected by natural gas; the more spending that occurs outside the community, less economic benefit will accrue locally."

A detailed and particularized study, not hypothetical projection, is necessary in order to determine whether this project is in the public interest or not. The potential public interest

² In a different context, DRBC considers "A project that is in the public interest is one that, at a minimum, provides housing, employment, and/or public facilities needed to accommodate the adopted future population, land use, and other goals of a community and region without causing deleterious impacts on the local and regional environment and economy. In general, such a project would be one that conforms to a locally-adopted growth management plan which is undergoing active implementation by local officials, is supported by the larger community as a whole, and is compatible with national, state and regional objectives as well. For a project not fully meeting the above criteria, the Commission will weigh the positive and negative impacts to determine public interest. Water Code § 3.10.2(A)(2)(a)(5).

³ Available at <http://naturalgaslease.pbworks.com/f/Potential+Economic+Impacts+of+Marcellus+Shale.pdf>. See also Marcellus Shale: What Local Government Officials Need to Know, at <http://downloads.cas.psu.edu/naturalgas/pdf/MarcellusShaleWhatLocalGovernmentOfficialsneedtoknow.pdf>.

considerations to be addressed should involve, at a minimum, the costs of increased demand for medical care, schools, and other municipal services without corresponding tax revenue to pay for them; whether permanent jobs will be created or not and the likelihood that local residents will be employed because of the project; the extent to which local businesses will benefit from increased activity; and the natural radioactivity of the shale and the impacts it might have on the environment and on human health.

Nor should public interests at the municipal level be overlooked. While Pennsylvania law allows municipalities to request bonds on natural gas wells and highways, these bonding provisions are severely inadequate to safeguard local infrastructure. A bill is pending in the PA legislature to increase the amount of a natural gas bond, but has not yet passed. Highway bonding is woefully out of touch with the realities of highway maintenance and repair: when permits are issued for overweight vehicles using local roadways, the municipality can require either \$6,000 per linear mile for unpaved highways, \$12,500 per linear mile for paved highways, or \$50,000 per linear mile for any highway which the posting authority allows to be maintained below a level consistent with the type of highway for type 1 and 2 permits, or \$10,000 for each county or municipality covered by the permit for type 3 permits. Pa. Code Sec. 189.4. With highway repair costs reaching millions of dollars for even short stretches of roadway, these bonding provisions do not give adequate protection from heavy use by Stone Energy, subcontractors and related services to transport equipment, fresh water, wastewater, and other related materials.

W.C. Sec. 2.30.2 requires implementation of the DRBC's Policy of Protection and Preservation, which discourages the exportation of water from the Delaware River Basin due to frequent drought and limited quantity of waters. This requirement has not been strictly applied to the Draft Docket(s) because of the lack of specificity and the large number of requirements that have been transformed into after-the-fact docket conditions, especially concerning water conservation and flow considerations.

Stone Energy has failed to address the impact of its projects on the water resources of the Basin and on the local community, and therefore the DRBC cannot consider this project to be within the public interest or in keeping with the policy of protection and preservation at this point. Stone Energy should not be allowed to operate under a DRBC-issued Docket(s) until each required issue is adequately addressed. The Commission has the power and the duty to require such answers from Stone, and should require this information prior to issuing any Docket(s).

Special Protection Waters Impacts

The proposed Stone Energy projects are also located in a Special Protection Waters area, subjecting them to additional requirements.

DRBC's Executive Director Determination dated May 19, 2009 stated that "as a result of water withdrawals, wastewater disposal and other activities, natural gas extraction projects ... may individually or cumulatively affect the water quality of Special Protection Waters [SPW]..." The WBLR is located within the drainage area of SPW, so the Commission must review and condition approvals based on ensuring that "no measurable change" to existing water quality "occurs at Boundary and Interstate Control Points," for these exceptional waters. W.C. Sec. 3.10.3.A.2.b.1. The Commission has already acknowledged that the Stone Energy application "may have a substantial effect on the water resources of the Basin "by reducing the flow in the

stream and/or depleting the groundwater serving as your water source, by adding, discharging or causing the release of pollutants into the groundwater or surface water, or by other means.”⁴

Non-Point Source Pollution

W.C. Sec. 3.10.3A.2.e.1 and 2 requires projects subject to review under Section 3.8 of the compact that are located in the drainage area of SPW to submit for approval a non-point source pollution control plan (NPSPCP) that controls new or increased non-point source loads generated within the portion of the docket holder’s service area which is also located within the drainage area of Special Protection Waters. The WBLR withdrawal point and the Matoushek well are located in an area designated as SPW, a NPSPCP is required and should address both post-construction stormwater controls and erosion and sediment control. It is unclear that the NPSPCP requirement has been adequately fulfilled.

The Draft Docket(s) makes a future submission and approval of an adequate NPSPCP a condition of the Commission’s approval. This is inadequate to comply with the requirements of DRBC’s own regulations and procedures.

Build Out and Future Approvals

W.C. Sec. 3.10.3.A.2.e.2 requires that “Approval of a new or expanded water withdrawal and/or wastewater discharge project will be subject to the condition that any new connect to the project system only serve an area(s) regulated by a non-point source pollution control plan which has been approved by the Commission.” This means that, to the extent Stone Energy’s NPSPCP does not encompass all its leaseholdings and expected future wells, the area served and estimate of water withdrawal needs must be capped at the amount in the Draft Docket(s) for purposes of future approvals.

In contrast, Stone Energy has admitted that “The amount of water requested from the [WBLR] will not provide enough water for a build out of additional, proposed wells. The volume of water requested is an accepted industry value and allows for the economic withdrawal of natural gas.” (Stone Energy, “Additional Information for Project Review”, Submitted to DRBC, June 8, 2009, p. 5.)

The Draft Docket(s) suggests that the water withdrawals can be used to support any of Stone’s leaseholdings in the Pennsylvania portion of the Delaware River Basin Commission. This is inconsistent with the applicable regulations and the applicant’s own admissions.

Operations Plan

The Draft Docket(s) suggests that an Operation Plan will be a condition of further activity at the Stone Energy M1 well. However, the operation plan is not yet complete, and must be completed and subject to public review as part of a Draft Docket(s), not as an after-the-fact condition.

The DRBC is requiring baseline testing as part of the proposed plan, however DRBC should require Stone Energy to perform ongoing and/or routine groundwater sampling to carry out its duty to ensure this project does not have a deleterious effect on the water resources of the Basin and its more specific duty under W.C. Sec. 2.20.5 to protect water recharge areas and W.C. Sec. 3.40.4 and 5 for the prevention of groundwater pollution and appropriate controls to conduct operations without violating water quality standards for groundwater.

⁴ June 6, 2008 letter from DRBC to Stone Energy.

The DRBC is requiring information on wastewater storage, handling and disposal as a part of the conditional Operations Plan, however, no details are available for public review and comment, other than the water will be transferred out of the basin. DRBC states in the Draft Docket(s) that “the commission recommends approval of the proposed exportation of non-domestic wastewater.” Upon information and belief, such an approval is premature, because 1) no approved operations plan is in place and 2) DRN has significant concerns that the location and status of the wastewater treatment facilities preliminarily identified by Stone Energy have only conditionally agreed to handle the wastewater, lack the adequate PADEP NPDES approvals to handle the type and volume of wastewater that will be produced, and/or lack the ability to adequately treat the produced wastewater. Moreover, Stone Energy previously sent the topsoil water from the unauthorized construction of the M1 well to an unapproved sewer authority in Pennsylvania. Therefore, there is a precedent for Stone Energy to be unable to assure that its wastewater will be handled in an environmentally responsible and/or legal manner. This information should lead DRBC to conclude that it is premature to issue a final docket(s) to Stone Energy.

PADEP Requirements

DRN believes that Stone Energy requires a new PADEP well permit. The issued permit states that it expires 3/14/2009 “unless drilling is commenced on or before that date and prosecuted with due diligence.” The history of the M1 well suggests that although well construction occurred within this timeframe – without DRBC approval - no production has occurred since that time. Stone Energy’s subsequent efforts to resolve its violations at the DRBC should not be considered to amount to diligent prosecution of the drilling. Therefore, DRN believes that the PADEP well permit can be considered expired.

Further, it is unclear whether Stone Energy has complied with PA Code Ch. 105 and/or 78 for any dam, reservoir, water obstruction and/or encroachment associated with the site.

It is unclear whether Stone Energy has complied with PA “Act 220” water use registration requirements.

Miscellaneous

Sections 2.1.4 and 2.5.2 of the W.C., as well as certain portions of the 1982 Good Faith Agreement require DRBC to require conservation efforts. The portions of the Stone Energy Draft Docket(s) lack the level of detail to evaluate the nature and sufficiency of measures required of Stone Energy.

W.C. Sec. 2.150.1 requires sound practices of watershed management within the Basin. This requirement has not been strictly applied to the Draft Docket(s) because of the lack of specificity and the large number of requirements that have been transformed into after-the-fact docket conditions.

W.C. Sec. 2.200 requires DRBC to maintain the quality of basin waters in a safe and satisfactory condition for wildlife, fish, and other aquatic life. This requirement has not been strictly applied to the Draft Docket(s) because of the lack of specificity and the large number of requirements that have been transformed into after-the-fact docket conditions, especially as concern water conservation and flow requirements.

General Comments

Special Protection Waters

As stated above, the DRBC's Executive Director Determination dated May 19, 2009⁵ stated that natural gas development was expected to have the potential to substantially impact the water resources of the Delaware River Basin's Special Protection Waters (SPW), which includes the West Branch of the Lackawaxen River and the Lackawaxen main stem. The Commission stated it would review and condition approvals based on avoiding the degradation of these exceptional waters. There are ongoing studies and new analyses, including a proposed cumulative impact analysis that should accompany the development of rulemaking to amend the Water Code for natural gas extraction and development that need to be completed in order to accurately assess the impacts of this Docket and future gas-related dockets. Such assessment is necessary in order to plan and design natural gas projects so that degradation of the resources of Special Protection Waters can be prevented. Action should not be taken in the absence of such critical information.

Flexible Flow Management Plan

DRN also points out that the Flexible Flow Management Plan (FFMP) that the Commission is developing for rulemaking needs to be completed before any natural gas related projects are approved. While the FFMP applies to releases from the New York City reservoirs and affected waters, the flows of the main stem River are directly fed by all of its tributaries. Also, it has been stated that the methods and policies that are part of the FFMP program, such as the application of an "Ecoflow" model to set flows, will be used throughout the Delaware River Watershed. Illustrating the interconnected nature of this tributary to the FFMP and New York City releases, is the letter submitted by New York City Department of Environmental Protection (NYDEP) that states that due to the flow targets the City is required to meet at the Montague and Trenton gauges, they do not want water withdrawals to be made from the West Branch of Lackawaxen River while releases are being made from their reservoir system due to the potential impact of the depletive withdrawal on downstream river flows.

The Commission is in the process of developing the Flexible Flow Management Plan (FFMP) for the Delaware River⁶. New Amendments to the Commission's Water Code are being developed after previously proposed amendments (published December 2007) were withdrawn in December 2008, amidst much public controversy. Work continues since July 2007 by the PA Fish Commission and others to finalize a Habitat Model that incorporates an ecologically based flow regime. New rulemaking has not been noticed yet by the Commission, however, several studies and analyses are being conducted by Commission committees, subcommittees and staff. Until that process is completed and the FFMP adopted, no approvals for water withdrawals or gas development and extraction projects should be granted. Complete information is needed to inform decisions regarding any further allocation of water, especially for a consumptive/depletive use, such as the water withdrawal Docket represents.

In the interim while the FFMP studies are being developed, the Supreme Court Decree Parties (States of New York, Pennsylvania, New Jersey, Delaware and City of New York) put in place a management plan for releases from the New York City reservoirs. The Decree Parties announced changes to the FFMP⁷ in June 2009 for the period June 1, 2009 to May 31, 2010. The changes were aimed at improving downstream habitat by additional release of cold water.

⁵ EDD5-19-09, www.drbc.net

⁶ <http://www.state.nj.us/drbc/FFMP/index.htm>

⁷ http://water.usgs.gov/osw/odrm/documents/Temporary_2009_Summertime_Releases_Agreement_Final_Approved.pdf

The West Branch of the Delaware will receive an additional 100 cubic feet per second (cfs) from Cannonsville to improve trout habitat during the summer months. Barring drought conditions, this will translate into 300-325 cfs of cold water released at Cannonsville to reduce thermal stress on fish in the West Branch and in the upper reaches of the main stem for most of this season. An "Extraordinary Needs Bank" was also established to hold water for other needs that may arise. Also New York City was allowed more flexibility in reservoir operations to try to reduce the rapid fluctuations of releases which can cause havoc on downstream aquatic life. State fishery experts and technical review of the effects of the FFMP over the past season led to the changes.

Even with these recent changes, the FFMP is still controversial and agreement has not been reached with fish conservationists regarding the release program and how flows will impact fish downstream and about "ramping", the sudden drop in reservoir releases from Cannonsville.

These recent events regarding the FFMP illustrate the level of involvement and the technical complexities of flow management in the Delaware River, particularly the Upper Delaware River Watershed. Of course, the three New York City reservoirs in the upper River supply 7-9 million city dwellers with water, which dominates Delaware River management goals. Layered into the rubric of Upper Delaware flow management is the required minimum flow target at Montague that New York City is required to maintain through reservoir releases to protect the Delaware River downstream, including deflecting salt intrusion at Philadelphia/Camden and maintaining water supply quality for the 8 million downstream people who rely on the Delaware River for water. Substantial public involvement, government studies, technical analyses and re-analyses go into every cubic foot per second that is released to the River's streams by New York City. With this reality as a backdrop, it is clear that the depletion of up to .70 million gallons per day by Stone through this Docket is potentially very significant to the main stem Delaware and the flow regime that will be set by the FFMP.

Further, this withdrawal coupled with future applications for water withdrawals and/or natural gas drilling sites in the West Branch and main stem Lackawaxen River as well as other tributaries and the main stem Delaware River present an even larger question in terms of total impact of this removal of water from the Basin. Yet the environmental, social/cultural, political and economic issues that are considered in the matrix of sustainability are not being considered. In fact, the approval of this Docket forecloses the ability to provide a level playing field for water withdrawal applicants going forward as it secures a .70 mgd consumptive use. It begs the question: how will this Docket and all future water withdrawals affect the FFMP's success at meeting water supply and ecological needs? Painstaking efforts are being made by the public, scientists, and the government to manage the flow of the River and its tributaries to serve water supply and conservation needs. Will water for natural gas development trump these efforts or make meeting present goals and uses more difficult, costly, or impossible? Will other withdrawals eat into the efficacy of the FFMP's reservoir releases? And at whose expense? These questions need to be answered by a cumulative analysis of impacts of the development of natural gas in the Basin.

There has been no public discussion of these issues. Before approval is granted, there should be an analysis of how this Docket will interplay with the FFMP and the ecology of the Delaware River. A plan should be developed that provides a calculation of how much total water can be removed without degrading SPW resources. Also, location of withdrawals, rate and timing of withdrawals, pass-by flow requirements and flow regimes, nonpoint source pollution control

plans and other aspects of Dockets can be informed by an analysis of tributary and main stem flow regime needs. This is essential to prevent water resource depletion.

Basinwide Cumulative Analysis

Considering that the industry forecasts that Marcellus Shale could be the largest producer of natural gas in the nation and considering that the most prolific Marcellus formation is thought to be located in the Northeast portion of the formation (Wayne County, PA and Delaware and Sullivan Counties, NY) it is reasonable to expect that natural gas production will be a major activity in the Delaware River watershed for many decades. Terry Engelder, Penn State Geoscientist, projects that 168-516 trillion cubic feet of gas is contained in the Marcellus Shale field and that about 50⁸-360⁹ trillion cubic feet of that is recoverable. Engelder estimates the value of this at \$1 trillion, a major asset for the industry. This has fueled a “gas craze” in the Marcellus shale fairway and Pennsylvania has the largest percent of land underlain by the Marcellus shale. That is why permits are being issued at a record pace and PADEP forecasts 5,200 permits to be issued in 2010, a stunning increase in activity, especially when viewed in historic terms. These numbers dwarf gas permitting in any other state involved in the Marcellus shale play.

The Commission should recognize that natural gas activities, once established, are here for the long term. The life of a typical well is 20 years; it is reasonable to assume that the industry will be a dominant resource user here for the next 50 years or so. This requires planning and assessment on a large scale. A basin-wide cumulative analysis of how gas drilling can be expected to affect water resources throughout the Watershed requires careful science-based study. But using data such as industry projections of the most efficient spacing of wells, the land needed for each well site, signed leases and parcels with potential leases, and a projection of water consumption needs and wastewater disposal at full build out, a projection of the fully built gas industry in the Basin could be modeled and the resource consumption/effects calculated. This could then be used to assess the impacts of these activities on the resources of the Watershed, including Special Protection Waters (to prevent degradation) and the other designated uses of the River (to avoid diminishing impacts and preserve/achieve highest and best use) and will help inform better decision making regarding Dockets.

A comprehensive basin-wide analysis may also identify special resources or areas where no gas drilling should occur, considering the potential impacts. These especially vulnerable areas may include critical, endangered, threatened or rare habitats or species, floodplains and wetlands and their buffers, steep slopes, unique natural features, groundwater recharge areas, specific geologic formations, municipal well heads and surface water supply reservoirs, densely populated areas, scenic resources, historic features, or other vitally important and irreplaceable assets. If permits are issued prior to an analysis that inventories such especially sensitive areas, these features may not be known and we will lose what we have before we know we have and what we need to protect. Many of these features are known through Wild and Scenic Rivers Act recognition of the Upper, Middle, and Lower Delaware River but many features throughout the contributing watershed are not catalogued or fully understood.

No permits should be issued by the Commission to Stone or any other natural gas related project until this cumulative analysis is complete, planning is done based on expected impacts, and regulations adopted to prevent pollution and degradation/diminution of water resources and the natural assets the Watershed supports.

⁸ <http://www.geosc.psu.edu/~engelder/>

⁹ Mary Esch, Associated Press, pressconnects.com, 11.04.08

Other Important Actions Prior to Permitting

There are several other in-process regulatory and/or legislative processes that should be accomplished and implemented prior to the issuance by DRBC of permits for natural gas related projects. These include: PADEP Chapter 78 drilling standards for natural gas wells; PADEP Chapter 95 and 93 effluent and water quality regulations to address natural gas drilling and other high-TDS wastewaters; the federal FRAC Act before the U.S. House (H.R. 2766) and the Senate (S. 1215) to remove the exemption of hydraulic fracturing from the Safe Drinking Water Act. These and other initiatives will make gas drilling safer and should address some of the issues that the Commission will be addressing in its rulemaking. It makes sense to allow these changes to occur before considering allowing shale gas development here in the Delaware River Watershed.

Specific Impact Comments

Status of Streams Threatened by the Stone Energy Permit

DRN submits as attachments to this comment, past stream data (non-agency data, under assumption DRBC has readily accessible data from partner agencies that exists) available for the West Branch Lackawaxen River Watershed that we were able to identify as we prepared for this comment.

We also include and highlight data specifically collected by DRN for the West Branch Lackawaxen River Watershed through its new monitoring project launched in February, 2010 to begin collecting water chemistry data in tributary streams in the Upper Delaware where natural gas exploration may occur. We piloted this project coordinating with the Lackawaxen River Conservancy, United States Geologic Survey (USGS), PADEP, DRBC, Pennsylvania Fish and Boat Commission (PFBC) and National Park Service (NPS) to identify gaps where routine monitoring is not taking place. Many of the small tributary streams are not being monitored regularly so our focus area was these tributaries rather than the main stem Delaware for example.

DRN has over 20 stations established but we focus our data sharing here to the West Branch Lackawaxen (4 stations), two unnamed tributaries that drain from the M1 well site (2 stations), and Johnson Creek, a tributary to the West Branch located just north of the Matoushek Well (1 station) (see Figure 1 below).

DRN data was collected at six stations using standardized water chemistry protocols that were reviewed and approved by US Geological Survey, Dickinson College's ALLARM program, DRN, and the meter manufacturer through the statewide Consortium for Scientific Assistance to Watersheds (C-SAW) Program. Datasheets were standardized and all data collectors attended a 4-hour training session in January that included blind sampling to test methods, accuracy and precision. A trained environmental scientist (with a MS degree in environmental management) collected the data submitted in this comment for these six stations and also performed a windshield survey and photo documentation. Below is a map indicating the station locations established specific to the Stone Energy permit.



Figure 1. Map of DRN sampling locations with Stone Energy proposed impacts

Data was collected for total dissolved solids, conductivity, temperature, chloride, and conductivity (using a calibrated electronic meter) and visual observations of flow and weather were reported with flow information being recorded the day of sampling from USGS gage station 01428750 – Aldenville). At least two replicates in the field were collected for each parameter with a relative percent difference of less than 20% being used for QAQC purposes.

DRN will continue to monitor each of these sites monthly or twice a month while advocating for better monitoring including automatic data loggers, routine lab analysis, macroinvertebrate sampling, groundwater monitoring, etc. – all of which should be funded and maintained over the long term solely by the gas company who seeks to make a profit. This extensive and necessary monitoring should be a mandatory part of the permit approval process and should be accessible to the public with an online data system (again funded by the permit holder).

Extensive monitoring is a key component necessary and missing from the docket and much must be demanded by DRBC in advance to ensure a time sensitive monitoring network is in place before any drilling at all begins in the Basin.

Data Results

TABLE 1. Delaware Riverkeeper Network Water Chemistry Data (2/18 and 3/11/2010)

Station	Date	Avg. Conductivity (uS/cm)	Avg. TDS (ppm)	Avg. Salinity (ppm)	Avg. Temp (°C)	Avg. Chloride (ppm)	DS USGS Gage Reading (cfs)
JC	3/11/2010	78.2	50	40	8	20	85 (1200 hrs)
UTJC	3/11/2010	42.5	25	20	3.2	20	85 (1200 hrs)
UTWBL	3/11/2010	48.8	30	20	2.6	20	85 (1200 hrs)
WBLWDS	2/18/2010	73.5	50	30	1.5	20	42
WBLWDS	3/11/2010	114.8	75	50	1.6	40	170 (1700 hrs)
WBL2	2/18/2010	78	50	30	1.5	20	42
WBL2	3/11/2010	98.2	55	40	3.4	30	170 (1700 hrs)
WBL3	3/11/2010	103	70	50	40	30	170 (1700 hrs)
WBL4	2/18/2010	85.2	55	40	1.4	20	42
WBL4	3/11/2010	95.1	60	40	4.6	40	180 (1700 hrs)
Overall Averages		81.7	52	36	6.8	26	

DRN Sample Station Descriptions

Station	Stream	Location Description	Latitude	Longitude
JC	Johnson Creek	PA 670 (Bethany Turnpike)	41°42'05" N	75°22'09" W
UTJC	UNT to Johnson Creek	Sullivan Road/T536	41°41'11" N	75°22'30" W
UTWBL	UNT to West Branch Lackawaxen	PA 247 Clinton Township	41°40'41" N	75°22'09" W
WBLWDS	West Branch Lackawaxen	Rte 170 near Memorial Lakes (downstream of proposed Stone Energy withdrawal)	41°43'09" N	75°24'57" W
WBL2	West Branch Lackawaxen	First crossing of Rte 170, N of PA 247 (Yarnes Road)	41°41'03" N	75°23'18" W
WBL3	West Branch Lackawaxen	PA 247 Creamton Bridge (gage station)	41°40'28" N	75°22'34" W

**Photo-documentation and USGS Gage Information of Flow Conditions
Station WBL4. West Branch Lackawaxen River, Route 170/Wood Lane Clinton Twp.**

Latitude 41° 38' 28" N – Longitude 75° 21' 27" W

Photo A. Facing Upstream From Bridge

Photo B. Facing Downstream From Bridge

Photos Taken 2/18/10 Flow Rate 42 cfs USGS Station 01428750



Station WBLWDS. West Branch Lackawaxen River, Route 170/Memorial Links Road, Mt. Pleasant Twp. (just downstream of proposed Stone Energy Water Withdrawal Site)

Latitude 41° 43' 9" N – Longitude 75°24' 57" W

Photos Taken 2/3/10 Flow Rate 125 cfs USGS Station 01428750



Station WBLWDS. West Branch Lackawaxen River, Route 170/Memorial Links Road, Mt. Pleasant Twp. (just downstream of proposed Stone Energy Water Withdrawal Site)

Latitude 41° 43' 9" N – Longitude 75°24' 57" W

Photos taken 2/18/10 Flow Rate 42 cfs USGS Station 01428750



Creamton Fly Fishing Club Macroinvertebrate Data

Creamton Fly Fishing Club conducted macroinvertebrate surveys on the West Branch Lackawaxen in April 14 and October 7, 2000 along the West Branch Lackawaxen River. Because of the high quality and diversity of the survey, they resurveyed macroinvertebrates on April 16, 2005 as part of an investigation to determine if the stream qualified as Exceptional Value using the DEP antidegradation methodologies and a reference stream. A less technical survey was also conducted more recently on April 4, 2009. Water quality measurements and visual assessments were also taken at the time of the survey.

Links to these reports:

http://www.creamtonflyfishingclub.com/CFC_Macroinvertebrate_Study_of_the_West_Branch_Oct_2000.pdf

http://www.creamtonflyfishingclub.com/CFC_Macroinvertebrate_Investigation_of_the_West_Branch_Lackawaxen_River_Apr_05.pdf

http://www.creamtonflyfishingclub.com/CFC_Physical_Chemical_Biological_Study_April_2000.pdf

http://creamtonflyfishingclub.com/April_4_Bug_Study_Report.pdf

Data Summary & Quality of the West Branch Lackawaxen River

DRN data indicate the clean and diverse nature of the West Branch Lackawaxen, Johnson Creek, and the two unnamed tributaries that drain the Matoushek Well site showing naturally healthy levels for freshwater streams for all parameters sampled at each station. Conductivity readings for all stations ranged from 42.1 uS/cm to 118.6 uS/cm and the highest readings (which are also representative of clean streams) corresponded with higher flows due to snow melt and warmer temperatures on 3/11/2010.

Photo documentation and windshield surveys show the low flow nature of the West Branch Lackawaxen. Photos above especially at Station WBLWDS, located just downstream of the proposed water withdrawal depict a stream that does not appear to have abundant flow. Detailed macroinvertebrate studies conducted by the Creamton Fishing Club indicate that the West Branch Lackawaxen was in healthy condition both years and supported a wide array of benthic life with a good diversity of pollution intolerant organisms. Due to high diversity in 2000, the Creamton Fishing Club resurveyed and conducted a 2005 EV attainment study for the West Branch Lackawaxen that implemented sampling and analysis methods of DEP's Water Quality Antidegradation Implementation Guidance (2003).

The comparison of the West Branch Lackawaxen benthic data with an EV stream (Wild Creek – EV Stream in Carbon County) showed that the station at Corner Pool scored a 93% - meeting the 92% requirement for EV designation but the group did not submit a petition to PA DEP due to farmer concerns¹⁰. This station and its quality could warrant the upgrade to Exceptional Value of the length of the West Branch located upstream of it at a minimum and potential resampling may show that a larger stretch would meet the criteria.

At Corner Pool sampling location (just north of road to Hankins Pond), 33 taxa were collected, many of which were EPT taxa, consisting of six mayfly taxa, nine stonefly taxa and seven caddisfly taxa. The modified HBI score for this site was 1.61 and the modified EPT was 11,

¹⁰ Personal communication, Creamton Fly Fishing Club, Alex Lilje, Club President

and the modified mayfly percentage was 69.4%. The 2005 analysis at Mead's Bridge did not attain the 92% requirement for EV status as of the 19 taxa present in the 200 count subsample at Mead's, 9 were in the Rare (0-3 individuals) category. The report cited recent flooding likely affecting the caddisfly populations that had been present in the 2000 surveys.

The most recent streamside biosurvey conducted by the Creamton Fishing Club on April 4, 2009, which sampled the West Branch Lackawaxen River near the USGS Aldenville Gage Station, indicated the presence of at least eight different types of mayflies, six stonefly types, and three caddisflies. *Ephemera invaria*, *Maccaffetium vicarium*, *Paraleptoplebia adoptive*, *Leptophlebia cupida*, and *Isonychia bicolor* mayflies were all documented to be common (51 plus individuals) or abundant (11-50 individuals). *Pteronarcys dorsata*, *Taeniopteryx nivalis*, *Agnetina capitata*, and *Chloroperlidea* were stoneflies documented as common (51 plus individuals)¹¹.

We also understand that the West Branch Lackawaxen has naturally reproducing populations of brown trout, brook trout, and rainbow trout and the Creamton Fly Fishing Club has also documented the presence of freshwater mussels and *Elodea* sp¹². According to club members, a fish shocking survey by the Fish and Boat Commission has not been conducted on the West Branch due to private property issues, but there is a good possibility, knowing the land use of the area and the macroinvertebrates present, that this stream may qualify for a Class A fishery if sampled.

The West Branch is so abundant with fish that the Creamton Fly Fishing Club leases or owns 7-plus miles of stream along the West Branch where its 45 members recreate and enjoy. The club stocks between 1400 and 1800 trout of all three species in the 12 to 16 inch range each season. Many fish are caught in the 20 plus inch range. The club has traditionally been limited to 45 members, ensuring the opportunity for a quiet and solitary day of fishing on 7 plus miles of water. Also of note is that the Lackawaxen River has been named PA DCNR's River of the Year for 2010 due to exceptional quality, outstanding recreational values and biological diversity.¹³ See Appendix for Creamton Fishing Club information and the DCNR announcement news.

The Dyberry Creek, another neighboring and similar rural characterized stream to the West Branch that feeds into the Main Stem Lackawaxen near Honesdale, was recently upgraded by PA DEP from a High Quality Stream to an Exceptional Value Stream. This in addition to the benthic data collected by the Creamton Fishing Club could indicate conditions for the West Branch are better than its existing and current designated use. Dyberry Creek is also classified by PFBC as a Class A fishery.

Further evidence of the high quality of the Lackawaxen River is a recent report by the National Park Service. The National Park Service conducted sampling in the Upper Delaware Scenic and Recreational River and provided a report summary in February 2010. Of all of the twelve rivers sampled in the Upper Delaware Scenic and Recreational River, the Lackawaxen River had the most taxa of all the streams (35 taxa) with the exception of the Mongaup (38 taxa) and it tied with Equinunk Creek (35 taxa). Of those taxa, 22 taxa were EPT with a 1.11 Shannon Diversity Index. All specific conductance readings for the entire Upper Delaware samples also did not exceed a reading of about 105 uS/cm. See Appendix for the Report.

¹¹ Macini, Philip. Creamton Fly Fishing Club, 2009.

¹² Personal communication, Alex Lilje, Creamton Fly Fishing Club, April 8, 2010

¹³ <http://www.dcnr.state.pa.us/news/resource/res2010/10-0120-rotty.aspx>

Included in the Appendix is USGS water chemistry data for the main stem Lackawaxen at the Rowland Station collected in 2008 and 2009 (excel spreadsheet). From these results, and even with the various inputs for the entire basin for the Lackawaxen before it meets the Delaware River (including discharges from Lake Wallenpaupack), and in the summer months when flows are lower, we see healthy chloride levels, low conductivity readings, healthy pH and dissolved oxygen levels, and low MDLs for lead, nickel, zinc, copper, aluminum and various other constituents tested by USGS. Nitrogen and phosphorus levels are also healthy and low. This healthy condition, near the mouth of the Lackawaxen, helps illustrate the healthy quality of all the tributary streams that feed into it that may ultimately be jeopardized by the proposed Dockets.

Concerns of Total Dissolved Solids Inputs & Their Effects on Macroinvertebrates

The proposed natural gas well and water withdrawal that will bring potential spills, accidents and nonpoint source pollution and sedimentation with it, could have grave consequences for the diverse and healthy benthic life that live in the West Branch Lackawaxen. EPA studies show that mayflies, which can consist of up to 70% of our healthy Appalachia area stream (and that are abundant in the West Branch Lackawaxen), seem specifically sensitive to changes in Total Dissolved Solids (TDS) and are naturally dilute with levels of TDS less than 50 ppm¹⁴.

With this diverse aquatic life, DRBC must set standards and strict regulations and pro-active protections that are protective of these streams that will ultimately be affected by both the water withdrawal and the drilling operation. Analysis must be done to set standards that do not harm the living communities of our streams and rivers, as required by Special Protection Waters.

To examine why TDS is so important to aquatic life, it is important to understand that organisms in both aquatic and terrestrial environments must maintain the right concentration of solutes and amount of water in their body fluids. This involves excretion or the process of getting rid of metabolic wastes and other substances such as hormones that would be toxic if allowed to accumulate in the blood via organs such as the skin and the kidneys. Organisms must keep the amount of water and dissolved solutes in balance; this is referred to as osmoregulation.

Even in the absence of other stressors such as pH, organic enrichment, habitat quality, and metals, TDS/conductivity significantly explains impairment of aquatic life use. This is especially true in mayflies which as we can see from the data available for these tributaries, make up a predominant part of the river life teaming in these high quality streams¹⁵. TDS affects osmoregulation in aquatic animals and high TDS concentration can impair their ability to excrete harmful substances.

In the Delaware River, DRBC Special Protection Waters data (north of Trenton) for the main stem and 15 tributaries (1028 samples) show that the minimum TDS reading is 10 ppm, the maximum is 618 ppm, the median is 160 ppm, and the average is 183 ppm. The data above show that the West Branch Lackawaxen and tributary streams to it surrounding Stone Energy proposed impacts also have a low TDS with all streams averaging 52 ppm TDS, 81.7 conductivity uS/cm, 36ppm salinity, and chloride readings at 26ppm – all very low readings indicative of clean freshwater streams.

¹⁴ U.S. Environmental Protection Agency Region 3 TDS Webinar Power Point

¹⁵ U.S. Environmental Protection Agency Region 3 TDS Webinar Power Point

Therefore, in the Delaware River Watershed, background levels for these waters are generally low, which means that discharges, spills, leaks, and accidents of flowback and fracking water can have the potential to significantly raise the natural background levels, harming or destroying aquatic life, degrading water quality and reducing biological diversity. This is not allowed under the SPW program.

Therefore, the invertebrates that are documented and present in these streams are physiologically adapted to low TDS concentrations. The function of osmoregulation in these animals needs to be protected at these naturally adapted levels if they are to survive. If an accident or brine water leakage or spillage occurs, these diverse streams could be wiped out. Some aquatic life are more sensitive and show adverse impacts at 350 mg/L or even less.

According to a California study, "Spawning fish and juveniles appear to be more sensitive to high TDS levels. For example, it was found that concentrations of 350 mg/l TDS reduced spawning of Striped bass (*Morone saxatilis*) in the San Francisco Bay-Delta region, and that concentrations below 200 mg/l promoted even healthier spawning conditions."¹⁶ In the Truckee River, the EPA found that juvenile Lahonton cutthroat trout were subject to higher mortality when exposed to thermal pollution stress combined with high total dissolved solids concentrations.¹⁷

Also, the California State Water Resources Control Board's Quality Criteria states: "...Hart et al, have reported that among United states waters supporting good fish fauna about 5% have a specific conductivity under 50×10^{-6} mhos (50 micromhos/cm) at 25 °C: about 50% under 270×10^{-6} mhos (270 micromhos/cm); and about 95% under 1100×10^{-6} mhos (1100 micromhos/cm)

Other Unique Features and Creatures of WBLR

The WBLR is classified High Quality Waters and Cold Water Fishery.

The WBLR and the main stem Lackawaxen River have many special resources that are vulnerable to the potential impacts of natural gas development. The PFBC verifies on their website that the West Branch is an "approved trout stream" and is stocked (based on a PA Fish and Boat 2004 report). There is a small tributary to Lackawaxen River that shows as Class A Trout waters.¹⁸

Clams noted in the studies included the common occurrence at two stations of Sphaeriidae pisidium. Other mollusks and amphibians are discussed under the Suggested Monitoring program below (page 29).

Comments on Specific Docket Sections

Docket [D-2009-18-1**](#) (natural gas well drilling pad site).

¹⁶ (Kaiser Engineers, California, *Final Report to the State of California, San Francisco Bay-Delta Water Quality Control Program*, State of California, Sacramento, CA (1969))

¹⁷ (C.M. Hogan, Marc Papineau et al. *Development of a dynamic water quality simulation model for the Truckee River*, Earth Metrics Inc., Environmental Protection Agency Technology Series, Washington D.C. (1987))

¹⁸ <http://fishandboat.com/afm.htm>

The M-1 well site is located in the drainage area of Johnson Creek and an unnamed tributary to the WBLR. Headwaters to these streams are located on the site. It is stated that the well pad is not located in the regulated floodplain.

Docket Section A. Description 5. Physical Features, a. Site Description:

“The well location conforms to the setback limitations from existing buildings, water wells, streams, springs, bodies of water, and wetlands greater than 1 acre in size as required by Pennsylvania Oil and Gas Act Chapter 2 Section 601.205 *Well Location Restrictions*.”

The Commission should not be relying on the setback requirements of the PA Oil and Gas Act. These setback requirements are not adequate for protection of existing buildings, water wells, streams, springs, bodies of water, and wetlands. The Commission should establish its own setback distances in the regulations that it is developing for shale gas development based on protecting Special Protection Waters and watersheds and should adopt a rebuttable presumption of responsibility for pollution of water resources within that zone.

For instance, we recommend the setback and presumption of a pollution zone of a water well from a horizontal gas well to be at least 7,500 feet. This is based on the probable maximum distance that a horizontal well bore can travel from the vertical bore plus a buffer that equals the existing setback requirement. If technical advances allow for longer horizontal bores, then the distance should be lengthened for setbacks. This is the distance being recommended by our Pennsylvania coalition of concerned organizations (the Pennsylvania Campaign for Clean Water Oil and Gas Work Group) in testimony to the Pennsylvania legislature in regards to draft House Bill 2213. We also advocate a setback distance of 7,500 feet from waterways and water bodies and wetlands for all horizontal wells.

We realize that the M-1 well is a vertical well. Based on this, the presumption of pollution zone in the PA Oil and Gas Act is 1000 feet distance between a gas well and a water well. PA House Bill 2213 recommends an increase to 2500 feet. Considering the potential for pollution to a large area, such as the methane intrusion in Dimock PA from a Cabot shale gas well that fouled 9 square miles of aquifer and 13 homes, it is quite reasonable to set a separation distance with presumption of pollution between a water feature that includes water wells, water bodies, and wetlands and natural gas well of at least 2,500 feet. The setback distance should equal that at 2,500 feet.

Other distances such as the distance to an existing building should also be increased to be more protective of residents. Also in Dimock, residents are paying the price in their homes for the methane leak caused by Cabot during the development of a shale gas well. Many residents have to keep their windows cracked year round to let methane escape to avoid it building up inside. (Consider the acknowledged dangers of toxic methane gas - note the Massey Upper Big Branch Coal Mine disaster in West Virginia last week (April 5 2010) where methane gas caused a huge explosion, 25 deaths and 2 injuries and prevented rescue teams from reaching possible survivors for many days.) If the distance was increased, air and water pollution incidents that have been occurring regularly in Pennsylvania since the advent of shale gas extraction in the state would not have had such dangerous impacts on people and human health. The more conservative approach is to prevent pollution problems by setting more restrictive setbacks that remove people in existing buildings from harm's way.

Section A5. Physical Features, b. Well Pad and Well Description:

“BMP’s utilized at the site included siting the well/disturbed area outside of sensitive and special value features and minimizing total disturbed area during clearing, grading, and grubbing.”

While we agree that preventing disturbance is a good practice it is not an adequate Best Management Practice (BMP) as described in the application and Draft Docket, especially since the exact special features and sensitive areas are not inventoried and evaluated in the docket and because the minimization of construction activity is not put into perspective or assigned value through an evaluation of what exactly was minimized in terms of time and disturbance area. BMPs should be based on the wide variety of BMPs described in the PA BMP Manual at a minimum.

For instance, the BMP defined as Protecting Sensitive Features requires as a first step the Identification and mapping of special features and resources into a Sensitive resources Map and then the identification and mapping of the potential development areas. Then the reduction of encroachment that could be achieved through the minimization of disturbance BMP is evaluated in terms of value and stormwater runoff reduction in order to account for its use as a BMP.

This type of rigorous application of BMPs is what DRBC should be requiring for all gas well sites, not a simple statement by the applicant that this was done. There are at least 6 different categories of Stormwater BMPs in the PA Stormwater Manual that could be applied in a similar way on this site. DRN advocates that the Commission develop a highly protective Stormwater Program as part of the Nonpoint Source Pollution Control Plan that is employed at all gas projects, including the erosion and sediment control plans that are applied at these sites. In the interim the PA Stormwater BMP Manual is a good guide with excellent detail that should be adhered to, not simply alluded to in scant text. The BMPs utilized must be used for the construction as well as post-construction phases, so that permanent BMPs are in place to prevent nonpoint source pollution and runoff. This section of the proposed docket does not address post-construction BMPs that are required by PADEP for construction projects.

“After drilling, the cuttings were solidified by mixing with cement and disposed of in the lined drill pit in accordance with PA Code § 78.61.”

DRN advocates that this practice allowed in PA regulations not be allowed. We do not feel it is safe and certainly not protective of SPW waters. The possible burying of pollutants on site within this recharge region of groundwater is too great a risk to take to allow for this practice. Will these wastes be tested before mixing with cement and buried? Will these buried wastes be monitored or tested in the future?

The recent spill of drilling muds by Pennsylvania General Energy in Waterville, PA into Pine Creek which is the heart of the storied and popular scenic wonder known as the “Grand Canyon of Pennsylvania” should be a cautionary lesson here. The muds contained Airfoam HD which was later revealed to contain 2-BE, a dangerous chemical. These muds may very well be included in the cuttings that are being buried at well sites. Solidification with cement is not permanent, especially if conditions corrode the cement allowing dangerous materials to leak out.

“The M1 well log included as part of the Application indicates that the well was constructed in accordance with PADEP Chapter 78 Subchapter D regulations.”

PADEP has begun a public process that will amend their Chapter 78 Drilling regulations.¹⁹ DRN signed on with our colleagues to comments submitted regarding these proposed changes. One area that will be addressed is changes to address methane excursions from

¹⁹ Advanced Notice of Proposed Rulemaking 25 Pa Code 78 Oil and Gas Wells, www.depweb.state.pa.us (DEP Keyword: “Oil and Gas”)

drilling sites. The present regulations that were in place at the time this well was drilled are obviously in need of improvement (or rulemaking would not be proposed) and should not be considered adequate by the Commission. There should be testing and evaluation of the casings, grouting and other structural and safety aspects of the M-1 well that are applicable to Chapter 78 regulation.

“The M1 well and well site were constructed in accordance with PA Chapter 78 and PADEP Permit No. 37-127-20006-00.”

The PA Chapter 78 regulations, again, should not be relied upon as acceptable by the Commission and inspection and evaluation needs to be done independently to arrive at a reliable conclusion.

Section A5. Physical Features, c. Water Source/Water Storage Facility:

“The water generated during drilling was removed from the drill pit and disposed of at Valley Joint Sewer Authority in Athens, PA.”

As stated above, the removal and discharge of wastewater at this facility was not in accordance with present regulations.

Section A5. Physical Features, f. Onsite Chemical Storage Facilities:

“All chemicals, fuels, lubricants, etc. required for natural gas exploration and development at the site will be properly stored on the well pad in accordance with the Preparedness Prevention and Contingency Plan (PPC Plan) as required by 25 PA Code Chapters 91.34 and 78.55.”

Has the Commission inspected or checked inspection reports from PADEP to insure that the PPC Plan was in place and not violated? Incidents of violation of these plans have also been occurring in Pennsylvania. Again, in Dimock, the Halliburton hydraulic fracturing fluid spill occurred on a Cabot site that was found by PADEP to have a deficient PPC Plan. The resulting fish kill in Stevens Creek and pollution of wetlands may have been avoided if an effective plan had been in force. DRN advocates for the Commission to review the records for this site and to develop for all gas sites an effective plan protocol that may go beyond what Pennsylvania requires. Stone themselves have violated other PADEP regulations, including encroachment of a stream without a permit and cannot be relied upon to have followed regulations here. We also advocate that follow up be done to insure preparedness and prevention are in place at these sites, which handle very dangerous chemicals in extremely large quantities, especially when horizontal wells are being hydraulically fractured.

Section A5. Physical Features, g.i. Wastewater Containment, Sampling, Transport, Treatment and Disposal:

“As such, the use of steel tanks for non-domestic wastewater storage is required at the M1 Well Site as stated in Condition No II.u. in the Decision Section of this docket.”

DRN supports this requirement as a means of attempting to isolate contaminated waters from the environment and safely transport wastewater off site. Open pit storage of wastewater is dangerous, prone to leaks, overtopping, spills and accidents, and is the source of significant air pollution. Secondary containment around all tanks and meticulous tracking of volume and leak detection is recommended. Venting of stored wastewater should be monitoring for air emissions and filtering required if pollutants are being emitted.

“The docket holder is encouraged to reuse the flow-back water for well stimulation in accordance with Condition II.m. in the Decision section of this docket.”

DRN does not support the reuse of flowback water for well stimulation without regulations that require treatment of the flowback to protective standards. There are no regulations in place at

this time to regulate this reuse; there is no requirement for the testing and treatment of flowback water before reinjection for gas well stimulation which is a great concern due to the toxic nature of flowback from shale gas wells. Additionally, some pollutants in flowback may become concentrated over time when being reused or dangerous chemical interactions could occur with mixing of the constituents.

The Department of Energy has found that this wastewater product has “higher contents of low molecular-weight aromatic hydrocarbons such as benzene, toluene, ethylbenzene and xylene (BTEX) than those from oil operations; hence they are relatively more toxic than produced waters from oil production.”²⁰ The fluid also may contain salts (chlorides can be so high that the liquid, called “brine”, is 5-10 times saltier than sea water), high iron and barium levels, and may be acidic (typical range is 3.5-5.5).²¹ It is estimated that the produced waters discharged by natural gas operations are about 10 times more toxic than those from offshore oil wells.²²

New York State Department of Environmental Conservation identified NORMs as a substantial issue in flowback from Marcellus shale drilling since several radiological parameters were identified in samples of produced water or flowback from shale gas wells in PA and WVA, including Gross Alpha, Gross Beta, Total Alpha Radium, radium 226, and radium 228 and is expected to be found in New York Marcellus shale. Radium 226, the radionuclide of greatest concern in terms of human health, was found in the PA and WVA samples well beyond safe drinking water levels.²³

Further, flowback could contain some of the ingredients of hydraulic fracturing fluids used to stimulate the well. NYSDEC lists up to 260 “unique chemicals” and another 40 compounds (with ingredients that are not disclosed by the industry) that are being used for hydraulically fracturing in Marcellus shale in PA and WVA and that are expected to be used in New York.²⁴

“Nondomestic wastewater that cannot be reused for well stimulation will be removed from the site via tanker truck and conveyed to treatment and disposal facilities approved by the DRBC (if in the DRB and subject to Commission approval) as well as by the applicable state/Federal agency (if inside or outside of the DRB).”

In addition to the concerns expressed above regarding out of basin transfers (page 2), DRN does not support the removal of wastewater to facilities that are not subject to strict effluent and water quality standards that are protective of the environment. The regulations presently in place in Pennsylvania do not protect waterways from pollution from gas drilling wastewater. PADEP is promulgating regulations for high-TDS wastewaters as described above but these will not take effect until 2011 at the earliest. Even if the Chapter 95 and 98 regulations are adopted in 2011, DRN does not consider the proposed standards to be protective of the environment. DRN advocates for the Commission to develop strict regulations for gas drilling wastewater that is discharged within the Delaware River Basin that restores the wastewater to

²⁰ U.S. Dept. of Energy, Argonne National Laboratory, “A White Paper Describing Produced Water from Production of Crude Oil, Natural Gas, and Coal Bed Methane”, January 2004, page 4.

²¹ U.S. Dept. of Energy, Argonne National Laboratory, “A White Paper Describing Produced Water from Production of Crude Oil, Natural Gas, and Coal Bed Methane”, January 2004, page 5.

²² U.S. Dept. of Energy, Argonne National Laboratory, “A White Paper Describing Produced Water from Production of Crude Oil, Natural Gas, and Coal Bed Methane”, January 2004, page 4.

²³ NYSDEC Draft Supplemental Generic Environmental Impact Statement on the Oil, Gas, and Solution Mining Regulatory Program (DSGEIS), 2009, Table 5-10

²⁴ New York State Department of Environmental Conservation, Division of Mineral Resources, “Draft Supplemental Generic Environmental Impact Statement on the Oil, Gas, and Solution Mining Regulatory Program”, September 2009, 5-35 and 5-45.

the highest standards or at least to the standard that was met before the fresh water was used in gas well extraction processes.

“No on-site discharge of such non-domestic wastewaters, other than as allowed in this docket is permitted.”

DRN supports this affirmation of existing law.

Section A5. Physical Features, g.iii. Sampling and Record Keeping:

“Prior to removal from the M1 Well Site, all non-domestic wastewater shall be sampled and the results recorded in accordance with the Operation Plan required by Condition No. II.e. in the Decision section of this docket. Samples shall be representative of the nondomestic wastewater that shall be transported to the DRBC and State-approved off-site treatment and disposal facility.”

DRN supports the sampling of wastewater as described. In addition to the list of chemicals required in this section other constituents particular to the hydraulically fracturing fluid formula that is being employed at the gas well should be added. Since formulas vary from contractor to contractor, it is important that sentinel chemicals and toxic substances being used at the M-1 well be tested for in the sampling. DRN advocates that no toxic or hazardous materials be used at all in hydraulic fracturing in the Basin but absent of that prohibition, this testing is essential to assure that the most potent and dangerous chemicals are captured in the monitoring protocol.

Section A5. Physical Features, g.iv. Wastewater Treatment and Disposal:

“All wastewater, domestic and non-domestic shall be conveyed to the treatment facility designated in the M1 Well Site Operation Plan or as otherwise approved in writing by the DRBC Water Resource Branch Manager as well as by the applicable state/Federal agency (if inside or outside of the DRB).” DRN’s comments under Section 5 g.i. apply here.

Section A5. Physical Features, h. Supporting Ancillary Facilities:

“The proposed ancillary facilities include Stone’s WBLR surface water withdrawal point and the off-site wastewater treatment facilities that will accept the domestic and non-domestic wastewater. Additional facilities will be required to convey and process the natural gas from M1 Well Site including pipelines, compressor stations, separators/liquid storage tanks, etc, however, the locations of these facilities have not been specified.”

In addition to concerns expressed above regarding the lack of a NPSPCP for the Area Served (page 5), DRN advocates that the Commission put regulations in place for prevention of pollution and degradation from all ancillary facilities. Without such, the Commission will not be able to accomplish the goals of SPW or prevent adverse impacts to water resources.

Section B. Findings, Special Protection Waters

“The docket holder submitted a general NPSPCP with the Application. However, no additional site construction activities, well stimulation, or water staging approved by this docket shall take place at the M1 Well Site until a site specific NPSPCP including measures to control stormwater both during and post construction on the site has been submitted to the Commission and approved by the Executive Director and any other necessary federal, state, and local authorizations have been issued.”

As expressed above (*Non-Point Source Pollution*, page 4 and *Section A5. Physical Features, b. Well Pad and Well Description*, page 21), the NPSPCP should be fully developed under SPW regulations and appropriate BMP standards for the site now during public review of the proposed Docket, not as an afterthought. Certainly, the scaled back administration of PADEP’s stormwater management program for oil and gas wells does not come near the level of protection that is needed for the WBLR. DRN, with our colleagues, has filed a letter of

complaint with PADEP over the changes made to the PADEP Stormwater Program that removed key provisions of the regulations such as PADEP technical review of stormwater management plans and Conservation District inspection of the implementation of erosion and sediment control systems on the well site.²⁵

Arguably, the NPSPCP is at the heart of the SPW program considering that EPA considers nonpoint source pollution to be the major cause of degradation to waterways across the Nation, including the Delaware River Watershed. The potential for degradation of SPW from nonpoint source pollution for gas well development in the watershed can reasonably be expected to be a major cause of adverse impacts to water quality here and without effective prevention of this pollution the Commission will fail in its efforts to protect resources and sustain “no measurable change” to the exceptional water quality of the Delaware River.

Section B. M1 Well Site Operation Plan:

“In accordance with Condition II.e. of the Decision section of the docket, at least 45 days prior to the scheduled initiation of any activity at the M1 Well Site, the docket holder shall submit an Operation Plan (OP) for the M1 Well Site to the Executive Director. The OP shall include the specifics of the site operations, detailing at a minimum...”

As expressed above (*Operations Plan*, page 5), the Operations Plan must be part of this public comment period available for public review and comment.

Section B. Pre-Alteration Groundwater Quality Survey Plan:

“Prior to initiation of hydraulic fracturing at the M1 Well, the docket holder will submit a pre-hydraulic fracturing groundwater quality survey plan, receive Executive Director approval, and conduct the groundwater quality survey.”

DRN supports that a pre-hydraulic fracturing survey plan be conducted. However, we have several suggestions for the scope of the survey and monitoring. The required program is a good start but not complete enough to prevent pollution and degradation. First, any testing should be of all wells within the described radius, not a representative sample. Also, the radius needs to be expanded and based on specific geologic features, not a concentric circle. Further, monitoring wells should be installed at appropriate depths set by an aquifer analysis to measure and catch pollution before plumes move off the well site. These should be maintained in perpetuity during the well’s life at the expense of the permit holder. Any clean up due to pollution must be cleaned up and paid for by the permit holder; accurate data will help to inform the facts about responsible parties and remedial action needed. The parameters being suggested are a good start but based on comments above (*Docket Section A. Description 5. Physical Features, a. Site Description, page 21*), will need to be refined and perhaps expanded based on specific hydraulic fracturing fluid formulas and flowback constituents that are revealed through sampling.

Suggested Monitoring in Addition to Section B Pre-Alteration Groundwater Quality Survey Plan Requirements

Necessary Monitoring Must be in Place Before Gas Drilling is Considered in the Upper Delaware or One Permit is Granted

Because of the clean nature of the WBLR and other tributaries in the region and the citizens and drinking water residents downstream of the Upper Delaware River that may be affected by natural gas and the Stone Energy operations, a comprehensive, far-reaching and multi-faceted monitoring program must be put in place and functioning before any natural gas permits are

²⁵ Letter to John Hanger, PADEP from PA Campaign for Clean Water, 3.31.09.

granted. The proposed monitoring in the Dockets is not comprehensive enough and needs to be put in place far ahead of any activity on the project sites. Collection of baseline data before any permits are granted for both groundwater and surface water and the biological life that lives within our streams must also be conducted along with continued monitoring on a regular basis throughout the life of the impacts.

DRBC Needs to Dedicate and Hire its Own Inspectors

It is abundantly clear, and evidenced by the most recent well fire at an impoundment near a shale gas drilling operation in Washington County²⁶, that PA DEP inspectors, even with the new recent hires, are not responsive and already overwhelmed with the growth in natural gas well development through the state. To ensure Special Protections Waters and the entire Basin are protected, the Commission must set up its own inspector program staffed with highly trained and experienced inspectors to catch errors before pollution happens. Without DRBC inspectors, it is not realistic to expect that Condition q. of the Decision can be carried out. Additionally, as part of the permitting process, the Commission may want to require the Permit Holder to have an onsite inspector during critical times of production and development.

DRN is gearing up to have its own watch-dogging monitoring efforts but this limited volunteer effort will not be protective enough for the Watershed and full time and multiple staff are needed to ensure mistakes are prevented. The increased agency-led staffing and monitoring that would be required because of the natural gas industry, should be fully funded and maintained financially from the natural gas industry itself that profits through permitting. There also needs to be a strict and rigorous inspection and penalty program where fines are substantial so as not to be simply and cynically be a part of the “cost of doing business”.

Wherever there is a cost borne by the public for activities related to gas development such as monitoring, inspections, cleanup activities, etc., resources from the private industry should be used. As far as monitoring costs are concerned, it is unacceptable to have these monitoring costs carried by taxpayers and completely reasonable to expect the industry to bear the costs to our government officials who will have to refocus their already limited time and energy to safeguarding our streams and rivers from the gas industry. (It is important that the inspectors are agency officials and not be agents of the oil and gas industry itself – they must have full and complete autonomy and direct enforcement powers).

We question the validity of granting permits in the highest quality streams of the Watershed in terms of meeting anti-degradation goals. At a minimum, a comprehensive analysis of the potential for degradation and adverse impact and degradation from the build-out of natural gas development on the water resources of the Basin must be concluded before permits should be granted, as expressed earlier in this comment. The issue of off-limit areas for drilling, such as EV and HQ watersheds, needs to be addressed in such an analysis. Absent a full moratorium on special streams and high quality watersheds, there should be larger fees established for developing gas in HQ, EV and Special Protections Watersheds as there is more at risk in these regions.

Other Monitoring Needs for the Unique Resources at Stake

In addition to more inspectors, agency personnel must be sure that adequate baseline data is collected and inventoried for all of the tributaries that may be in jeopardy. For example, though the Commission has a rigorous main stem sampling program and stations on some of the

²⁶ Weekly Press, Philadelphia's Community Newspaper. April 7, 2010. Fire at Pennsylvania Fracking Site.

major tributaries, there are many data gaps for the small tributary streams, like Johnson Creek, and other unnamed tributaries to the WBLR. The last biological assessment available for the West Branch by PADEP was conducted back in the early 2000s. More recent data is necessary and baseline data is key to ensure antidegradation policies are working as required by the Clean Water Act and SPW.

Real-Time Data Sonde Data available to Public on Internet

The Susquehanna River Basin Commission (SRBC) is in the process of installing a network of 30 real time water quality monitoring stations at sites along tributaries of the Susquehanna River. Called the Remote Water Quality Monitoring Network (RWQMN), it will complement the commission's Early Warning System (EWS). The SRBC notes itself that the recent expansion of gas drilling in the northern portion of the basin, and the associated increase in the potential for pollution, has necessitated this expansion of the water quality monitoring network in order to protect drinking water supplies and stream habitat health.

The RWQMN will consist of data sondes submerged in streams in priority watersheds selected from within the northern portion of the basin. These devices will be connected to a data platform which will supply power and provide remote communications abilities. The sondes will be capable of monitoring temperature, pH, conductivity, dissolved oxygen and turbidity. Additionally, they will record stream depth to help determine relationships between these quality parameters and stream flows.

The real time nature of this network is important because many pollution events can be short lived, and the contaminant may no longer be present in elevated quantities by the time negative environmental effects manifest. By taking measurements of 5 water quality parameters as often as every 5 minutes, the RWQMN can help detect possible pollution events as they occur. If the monitoring station detects deviations from baseline levels, it will alert SRBC members that further investigation is needed. Residents, the public and regulated industries and officials in charge of public water supplies will also have access to the information provided by the network.

For the RWQMN, it is projected that each monitoring station will cost approximately \$19,200 to install and \$3,800 annually to maintain. Because this network is required to monitor the effects of the gas drilling industry, the gas drilling permit holders should be required to fund its construction and maintenance. A similar network of datasondes needs to be employed in the Upper Delaware in advance of any permits being granted.

Lab testing of Well Water and Stream Water

In addition to this network of real-time data, lab testing of additional constituents must be part of the permit process and required for both the groundwater and the nearby drainage stream water that could be affected by each operation. As stated above, the parameters tested for needs to be refined and perhaps expanded. (*Section A5. Physical Features, g.iii. Sampling and Record Keeping, page 21 and Section A5. Physical Features, g.i. Wastewater Containment, Sampling, Transport, Treatment and Disposal, Page 23*).

It is also important that routine testing is conducted, documented and required (at the expense of the Oil and Gas operator) through the life of the well operation in order to detect pollution plumes that could affect groundwater over time. The monitoring information provided on Page 11 does not list frequency and this needs to be explicitly spelled out so regular and routine monitoring of groundwater is part of the required documentation.

In typical Pennsylvania soils, groundwater movement spans from .1 foot/day to 3 feet/day.²⁷ It is critical that if pollution occurs it is picked up quickly so monthly testing (of perhaps a slightly less rigorous list of parameters that would be used to indicate a problem) should be conducted at a minimum.

DRN advocates that the separation distances be expanded in the permit conditions as discussed above (*Section A5. Physical Features, g.iii. Sampling and Record Keeping*, page 21) but absent that, sampling should be increased in situations where a home is closer to a well pad site. So for example if groundwater can move 3 feet per day and if a home were located 500 feet from the well and impoundment operations, first response testing of limited parameters should be required more regularly at that well compared to if a house was located 7,500 feet from the well.

Macroinvertebrate and Other Stream Studies

At the same return, nearby streams and drainages should also be given the same monitoring and protection as the groundwater and well water to be able to detect pollution problems. The data loggers explained above will assist with this but more extensive lab testing should also be routinely completed and it should be designed around the impacts of each specific well with upstream, downstream and recovery stations.

In addition, it is critical due to the often quick nature of spills, that baseline and then routine macroinvertebrate sampling be conducted for streams where drainage areas are affected by the wells to catch any pollution that may otherwise go undetected. For this operation, it would include the tributaries and main stem of the West Branch Lackawaxen as well as the larger Lackawaxen River itself. Other surveys of amphibians, threatened, endangered, and rare species and species of special concern and mussel surveys should also be conducted as baseline prior to any activities contained in the Dockets.

A mussel survey in the WBLR is likely to yield results. A FERC-commissioned study of the lower portion of the Lackawaxen (below the power station at Lake Wallenpaupack) found "...viable freshwater mussel community..." and "...thriving populations of the eastern elliptio [*Elliptio complanata*] with several size classes..."²⁸ While dwarf wedge mussels were not found due to the lack of habitat for that species, observed conditions in the upper reaches of the WBLR may provide habitat for the federally endangered dwarf wedge mussel (*Alasmidonta heterodon*) and other mussel species.

Also important is to ascertain if mussel populations in the main stem Delaware River would be affected by the proposed Dockets. Large freshwater mussel populations were found downstream of the Lackawaxen River confluence with the Delaware River. A NPS survey by USGS found 8 species of mussels, including *Elliptio complanata* which dominated in numbers, particularly in the downstream section.²⁹

²⁷ Dr. Brian Oram, hydrogeologist, Wilkes University, Personal Communication

²⁸ Normandeau Associates, "Survey for the Presence or Absence of Dwarf Wedge Mussels and Other Mussel Species in the Lackawaxen River, PA", FERC Project # 487, Nov 2001.

²⁹ USGS William A. Lellis, "Freshwater Mussel Survey of the Upper Delaware Scenic and Recreational River", 2001.

The NPS's Delaware Water Gap National Recreation Area (DWGNRA) states on its website that *Alasmidonta heterodon* (dwarf wedge mussel) was found within the DWGNRA.³⁰ This is downstream of the confluence of the Lackawaxen River and therefore should be assessed in terms of potential adverse impacts to this federally endangered species.

Section B. Measuring, Recording, and records Maintenance:

“The measuring, recording, and records maintenance system will include the proposed means with which to measure and record the amount of all water transported to the site by truck or any other means, the amount of water used at the site, the amount of water and fracturing fluids/ chemicals used in the natural gas well stimulation process, the amount of flowback recovered after stimulation, the amount and chemical composition of non-domestic wastewaters produced and stored at the site, and the amount and chemical composition of non-domestic wastewaters transported off-site for treatment and disposal. The method of sampling and analysis of non-domestic wastewater shall also be detailed in this plan. Measuring and record keeping activities shall be required for all non-domestic wastewater including produced water and flowback separated from the natural gas during the operational life of the natural gas well. The system will also record the truck number, license plate number and disposal location for each truck load of nondomestic wastewater transported off site.”

DRN supports the measurement, recording, and maintenance of records of the amounts of all fluids used at the site, the tracking of the transport of these fluids, and a manifest system that takes the fluids from origin to ultimate disposal point. DRN suggests this data be reported to the agency in real time so that tracking is efficient and any problems or accidents can be quickly fact checked in terms of quantities and materials being transported. Illegal disposal and dumping can also be minimized; such illegal disposal activities have occurred in Pennsylvania recently, making it clear that this safeguard is necessary.³¹

Section C. Decision

DRN comments herein do not support the Decision of the Docket. In addition, we do not support the relegation of responsibilities to the Executive Director as contained in the Decision. All decisions regarding this Docket should be made in the public arena with the opportunity for public examination and comment before a decision is made.

Docket [D-2009-13-1**](#) (water withdrawal)

The withdrawal site is located on the WBLR. Portions of the site appear to be in the 100 year regulated floodplain. No permanent infrastructure should be located in the 100 year floodplain plus a protective buffer of at least 300 feet from the floodplain, as defined by riparian soils.

Docket Section A. Description 3. Areas/Wells Served and Section B. On-site Findings Special Protection Waters:

“The surface water withdrawals from the WBLR withdrawal site shall only be used to support Stone’s natural gas development and extraction activities targeting shale formations within the drainage area of Special Protection Waters within the DRB in the Commonwealth of Pennsylvania...”

And “However, no site construction activities or water withdrawals approved by this docket shall take place at the WBLR withdrawal site or to support the natural gas well development and extraction activities targeting shale formations until a site specific NPSPCP including measures to control stormwater both during and post construction on the site has been submitted to the Commission and

³⁰ <http://www.nps.gov/dewa/naturescience/mollusks.htm>

³¹ The Associated Press, **Drillers admit dumping water in national forest**, www.post-gazette.com, 2.16, 2010

approved by the Executive Director and any other necessary federal, state, and local authorizations have been issued.”

The Area Served is not properly identified since there is only one well, the M-1 well, that is mapped. All wells that would use the water from this site must be mapped in order to identify the Area Served accurately. The Area/Wells Served section is supposed to be defined in a water withdrawal application in the drainage area of SPW. One of the reasons the Area Served is to be defined is because a Non-Point Source Pollution Control Plan (NPSPCP) is to be submitted for the project service area located within the drainage area of SPW (Water Code Article 3.10.3.A.2.e.1) and 2)). The Draft Docket only requires a NPSPCP for the area where the facilities for the water withdrawal project is to be constructed. This is not correct. Section 1) referenced above makes it clear that the service area for a withdrawal is the area to be served by that withdrawal, not just the withdrawal site. Section 2) further reinforces this by requiring that when a project is expanded, the system can only serve an area regulated by a Non-Point Source Pollution Control Plan approved by the Commission. The Commission must require the applicant to prepare a NPSPCP for all well sites that will be served by the withdrawal. Further, the NPSPCP must be reviewed publicly now as part of the public review of the proposed Docket and allowed to be submitted after the fact for approval by the Executive Director. The NPSPCP must be subject to public review, examination and comment.

Docket Section A. DESCRIPTION 4.a. Surface Water Design Criteria and Section B.FINDINGS, On-Site Findings Special Protection Waters:

“The intake proposed at the WBLR withdrawal site shall be constructed in accordance with a design approved by PAF&BC, USACE and U.S. Fish & Wildlife Service that in the agencies’ view minimizes to the greatest extent possible, impingement and entrainment impacts in the vicinity of the withdrawal site (Condition I.n. in the Decision section of the docket).”

DRN supports that these agencies’ standards be applied and suggests the input of other professionals in the field familiar with macroinvertebrates, mussels, and other stream life, such as USGS and independent scientists.

Docket Section B.FINDINGS, Off-site Natural Gas Development and Extraction Activities:

“The recommendation to approve the water allocation under this docket is based on the docket holder’s water demand to support Stone’s natural gas development and extraction activities within the DRB in the Commonwealth of Pennsylvania. Condition I.j. in the Decision section of this docket requires that surface water withdrawals from the Stone WBLR Withdrawal Site shall only be used to support Stone’s natural gas development and extraction activities in the drainage area to Special Protection Waters in the Pennsylvania portion of the DRB for natural gas wells targeting shale formations. The condition also requires that such sites must have been approved by the Commission and also the PADEP.”

DRN supports that the water not be removed from the basin and that use is subject to approval by the Commission, however, as expressed above, all wells where the water will be used should be identified and mapped now as part of this Docket.

The Commission should require a build-out analysis of Stone Energy’s planned natural gas drilling activities in the Watershed before the Docket is approved. All wells that will use the water withdrawn should be reviewed and considered by the Commission at the same time as the water withdrawal is considered in order to understand and plan for the water use.

The segmenting of the wells from the water withdrawal Docket removes information from consideration such as: How much water will ultimately be used by how many wells? Where will they be located? What will be the net export of wastewater after well development? What will

the spacing between wells? What is the ultimate change in land cover that needs to be addressed by nonpoint source pollution control planning? What are the potential water quality impacts on the WBLR, the main stem Lackawaxen River and the Delaware River such as temperature, flow regime (hydrology), dilution of pollutants, and pollutant loading? A cumulative build out analysis and proper identification of the full off-site gas development will help to answer these questions and will in turn make it possible to regulate so that pollution and degradation can be avoided in the local, regional, and basin-wide Watershed.

Docket Section B.FINDINGS, Off-site Non-Point Source Pollution Control Plans and Off-site Wastewater Generation and Disposal:

DRN's comments on these topics are found in Docket D-2009-18-1 above.

Docket Section B.FINDINGS, On-Site Findings, Pass-by Flow:

"The pass-by flow, which is based on 25 percent of the average daily flow, shall be a minimum of 5.9 cfs as measured at the Stone WBLR gage."

DRN opposes and objects to the formula employed to compute the pass-by flow at the withdrawal site. The contributing watershed is an 11.5 square mile drainage area. The pass-by flow is based on 25% of the average daily flow measured at Stone's WBLR gauge. Aside from technical questions regarding the efficacy of the pass-by rate, the approach to setting a minimum flow is wrong and will cause harm to the living creatures in the WBLR, the main stem Lackawaxen River and could also impact aquatic life downstream in the Delaware River.

DRN advocates for an ecological flow regime to be used to set the pass-by flow. This is very important in order to protect aquatic life in the stream at and below the withdrawal site. As discussed above (*Specific Impact Comments, Status of Streams Threatened by the Stone Energy Permit*, page 10-20), the benthic community in the WBLR are adapted to specific conditions that are of exceptional high quality and a specific flow regime.

Flow and temperature fluctuations and modifications from the water withdrawal could have major impacts to the fauna that live in the West Branch Lackawaxen. It was indicated that there are naturally reproducing brown, brook and rainbow trout in the West Branch, all species that rely heavily on cooler temperatures which could be elevated due to low flow conditions from the water withdrawal. Many EPT species are also influenced by water temperatures.

For example, maximum average temperature for juvenile brook and rainbow trout should be below 19 degrees Celsius while the short term exposure for these species is 24 degrees Celsius. The maximum weekly average temperature for spawning for these species is 9 degrees Celsius and the maximum temperature for embryo spawning should not exceed 13 degrees Celsius (Brungs and Jones 1977). Young of the year are particularly affected by swings in dissolved oxygen and temperature and the most sensitive species need to be considered when determining the allowable withdrawal. Daily changes in smaller streams also often have significant daily swings in temperature (as much as 6 degrees) (River Network, Sharon Behar. Testing the Waters.1997).

Therefore, real time dissolved oxygen and temperature loggers should be installed downstream of the proposed water withdrawal (before granting the withdrawal to measure throughout this coming summer the daily swings and highs and low readings). After a summer of readings, the Commission will have better information to understand if the withdrawal can occur without decreasing the diversity and aquatic life protected by antidegradation. This data

logger must be maintained through the life of the project and the data used to inform how withdrawals can be made. Data should be accessible to the public as well as the agencies.

Flow logger measurements should be taken every hour or half hour in real time during withdrawal operations to adjust the withdrawal quantity and rate to ensure modifications are made to the withdrawal when swings and summer temperatures threaten aquatic life or when young of the year are more vulnerable. Installation of this device pre-water withdrawal for a full season is essential to provide the needed information necessary to determine what swing to expect and therefore determine a safe withdrawal level.

This would be the kind of information needed to inform a Habitat Model that could be used to set an ecological flow regime. The Commission is developing a model through its committees and subcommittees for use in the FFMP, as mentioned above, and such models can be used throughout the watershed. However, data is needed to uniform the model on site-specific needs of a subwatershed. This is especially important for the WBLR which is a very high quality stream with a healthy and diverse benthic community and fish and fishlife that are adapted to the natural flow regime.

Docket Section B.FINDINGS, On-Site Findings, Operations Plan:

DRN's comments on these topics are found in Docket D-2009-18-1 above and on Page 5.

Docket Section C. Decision, d.:

Final construction plans should not be approved by the Executive Director due to the deficiency of the Docket and applications.

Docket Section C. Decision, g. through w:

As discussed above in Docket D-2009-19-1, these aspects are not adequate in the Draft Docket due to the deficiency of the Docket and applications.

Docket Section C. Decision and y:

“For the duration of any drought emergency declared by either Pennsylvania or the Commission, water service or use by the docket holder pursuant to this approval shall be subject to the prohibition of those nonessential uses specified by the Governor of Pennsylvania, the Pennsylvania Emergency Management Council...”.

The Commission should control drought planning and emergency declarations, not rely on Pennsylvania. The nonessential use definition should be set by the Commission, not state agencies.

LENGTH OF APPROVAL: the Commission has set the expiration date for this Docket five years after its approval. The calculation of the amount of water to be used, the analysis of where and how that water is to be used, and the cumulative impacts of the water use should all be part of a cumulative analysis by the Commission before these Dockets, or any gas related permits, are approved. The fact that a term is attached to this Docket allows the Commission to calculate the amount of water that could be used by this withdrawal, allowing for a build out analysis of Stone's water withdrawal and resulting wastewater disposal to be done. This is a first essential step in assessing cumulative impacts.

Conclusion

Overall, DRN recommends that the Commission postpone action on Draft Docket Nos. D-2009-013-1 and D-2009-018-1 at this time. It is premature to approve a water withdrawal and

well pad for natural gas drilling activities from the West Branch Lackawaxen River (WBLR) until the Commission's rulemaking and studies on gas drilling, the FFMP and other build-out planning is completed. The Commission should complete key planning and management initiatives and should require complete and adequate information from applicants before granting any approvals for water withdrawal or gas wells from the Basin. We urge the Commissioners to recognize the magnitude of the natural gas issue in the consideration of this water withdrawal and gas well, which is just the beginning of what will doubtless be a transforming activity in our Watershed. Action by the Commission needs to be very conservative due to the scale and nature of gas development and it is reasonable and essential that all planning, assessments and rulemaking be completed before final dockets are approved.

Thank you for your consideration.

Sincerely,

Maya K. van Rossum
the Delaware Riverkeeper

Tracy Carluccio
Deputy Director

Faith Zerbe
Monitoring Director

Appendices to be submitted under separate cover