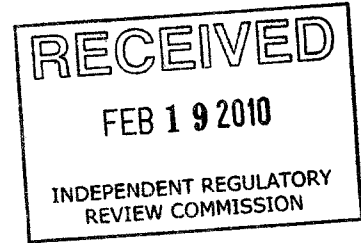


From: Hughes, Stephen [Stephen.Hughes@tetrattech.com]
Sent: Friday, February 12, 2010 4:32 PM
To: EP, RegComments
Subject: Comments on Chapter 95 Proposed Regulations
Attachments: Tetra Tech Chapter 95 Comments Letter.pdf



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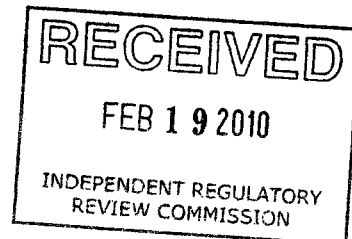
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PITT-02-10-022

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February 12, 2010

Environmental Quality Board
Rachel Carson State Office Building, 16th Floor
400 Market Street
Harrisburg, PA 17105-2301



Re: Proposed Amendments to 25 Pa. Code Ch. 95; TDS, Chlorides and Sulfates Effluent Standards (39 Pa. Bulletin 6467)

Dear Members of the Board:

Tetra Tech NUS, Inc. (Tetra Tech), as an associate member of the Marcellus Shale Coalition (MSC), is pleased to submit comments on these proposed rules as published in the Pennsylvania Bulletin on November 7, 2009 (39 Pa. B. 6467) and corrected on November 14, 2009 (39 Pa. B. 6547) on revisions to 25 Pa. Code Chapter 95. Our specific comments, which Tetra Tech assisted the MSC in preparing, follow summary recommendations listed below.

I. Marcellus Shale Coalition Recommendations

1. The MSC recommends that the EQB not adopt the 500 mg/l effluent limit for Total Dissolved Solids (TDS) and the proposed chlorides, sulfates, barium and strontium limits. Such limits are unnecessary and were proposed based upon incorrect assumptions and evaluations.
2. The MSC recommends that TDS, chlorides, sulfates, barium and strontium continue to be evaluated as potential WQBEL parameters in individual NPDES permits with appropriate limits set as necessary. This evaluation will involve recognition of a mixing zone specific to the watershed and discharge type in NPDES permit evaluations, rather than imposing strict end-of-pipe concentration requirements for all new and increased high TDS discharges. This approach will allow for the natural assimilation of the TDS that occurs prior to the withdrawal of source water for potable or industrial use.
3. The Pennsylvania Department of Environmental Protection (DEP) should implement a watershed assessment for new and increased discharges of TDS allocating the discharge limits (concentration) appropriately based on the assimilative capacity of the receiving stream for protection of the aquatic life and the designated use of the receiving stream.



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4. The MSC recommends that the DEP allow all industries to use managed discharges in accordance with an appropriate protocol to account for seasonal issues and to allow possible curtailment scenarios in the event of stream conditions approaching water quality standard exceedances. The protocol should allow use of average daily flow on flow controlled receiving waters in calculating the discharge limits in lieu of the 7Q10, especially for TDS. The MSC urges the DEP to also allow use of real time stream flow data to calculate effluent limits for TDS or its constituents.

5. The MSC also recommends the DEP Bureau of Water Quality Management work in concert with the Bureau of Solid Waste and the MSC to facilitate and encourage the efficient and effective management of the reused produced water as well as any produced solids generated during well operations.

II. The Marcellus Shale Coalition

The MSC was founded in 2008 and is an organization committed to the responsible development of natural gas from the Marcellus Shale geological formation. The Coalition membership includes more than 70 gas producing companies and associate and nonprofit members, with additional new members joining monthly. Member companies include those with an historic presence in the Commonwealth (such as EQT Production Company, East Resources, and Phillips Production Company) as well as those new to the Commonwealth (such as Anadarko Petroleum, Chief Oil and Gas, and Marathon Oil). The MSC member companies have a present role and very significant future role in enhancing the economy of the Commonwealth by way of the direct and indirect jobs created by the development of natural gas, a clean burning resource. As noted in a July 2009 study completed by the Pennsylvania State University, the Marcellus Shale has essentially created a new force in the Commonwealth. The "leasing, exploring, drilling and developing these natural gas reserves will directly generate thousands of high paying jobs and indirectly many others as employment is stimulated in support industries and as workers spend these wages and households spend royalty income." Many of these jobs have already been created. This same study estimates that Marcellus producers spent more than \$3 billion in 2008 and that for every \$1 spent by the Marcellus industry, another \$1.94 of additional economic output was generated.

The prospects for future growth of this industry are extremely bright. MSC member companies, in close coordination with their vast array of customers and suppliers, are focused on the responsible development of natural gas in the Marcellus Shale and the associated environmental stewardship. As just one example of its continuous improvement and environmental innovation, the industry has substantially reduced the anticipated impact on the waters of the Commonwealth



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by improved water handling and water management techniques practiced by many Marcellus Shale producers. These innovations and industry's improved understanding of how to best manage water and its reuse make for a vastly different set of circumstances than when these proposed rules were conceived approximately one year ago. At the same time, it has become clear to many parties that the historic and current nature of TDS and their loadings in the Commonwealth's waterways are poorly understood. Therefore, the MSC recommends a reconsideration of these rules after the DEP puts forth a more detailed analysis of the nature of the problem. If these rules go forward as proposed, the natural gas industry warns of threats to our ability to reasonably and economically address water-related issues associated with Marcellus Shale production.

III. The process and rationale for the proposed amendments to 25 Pa. Code Chapter 95 are flawed.

The stated authority for this proposed rulemaking is section 5 of the Clean Streams Law. That provision states:

The department, in adopting rules and regulations, in establishing policy and priorities, in issuing orders or permits, and in taking any other action pursuant to this act, shall, in the exercise of sound judgment and discretion, and for the purpose of implementing the declaration of policy set forth in section 4 of this act, consider, where applicable, the following:

- (1) Water quality management and pollution control in the watershed as a whole;
- (2) The present and possible future uses of particular waters;
- (3) The feasibility of combined or joint treatment facilities;
- (4) The state of scientific and technological knowledge;
- (5) The immediate and long-range economic impact upon the Commonwealth and its citizens.

The proposed rulemaking fails to adequately consider these statutory elements.

In the statement of background and purpose, the following are presented as basis and support for the proposed rulemaking:

- Total Dissolved Solids (TDS) may contain contaminants such as toxic metals and organic pollutants;



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- The major concern associated with high TDS concentrations relates to direct effects of increased salinity on the health of aquatic organisms.
- The major watersheds of this Commonwealth have a very limited ability to assimilate additional TDS, sulfates and chlorides;
- There is an upward trend in TDS concentrations in some Pennsylvania rivers;
- The Department of Environmental Protection (“DEP”) has received several permit applications in areas where the permits will not be able to be issued with limits greater than the water quality standards due to the high background concentrations of TDS;
- The goal of the DEP’s permitting strategy is to prohibit new sources of High TDS wastewaters and to achieve this goal, DEP proposes to amend Chapter 95 to establish new effluent standards.

The proposed rulemaking does not correctly explain the “problem” nor does it offer a solution that addresses the problem. Instead, an end-of-pipe limitation for new sources is proposed that is equal to the in-stream water quality standard and thus inappropriately would impose a one-size-fits-all approach that imposes an enormous burden on the Marcellus Shale industry, but does not address the TDS seasonal assimilative capacity condition. The following comments respond to the stated bases and support for this proposed rulemaking.

1. A TDS limit is not necessary or appropriate to address concerns relating to the potential presence of metals and organic pollutants in discharges.

In the preamble to the proposed rulemaking, it is asserted that an end-of-pipe TDS limitation of 500 mg/l is necessary because TDS may contain contaminants such as toxic metals and organic pollutants. There is no need to impose an end-of-pipe limitation on TDS to address a concern for individual constituents that may (or may not) be present in discharges of TDS.

By way of background, several years ago, Pennsylvania uniquely decided¹ to add TDS as a water quality standard based upon the existence of a United States Environmental Protection Agency (EPA) secondary drinking water maximum contaminant level (MCL). The basis for the EPA voluntary, optional secondary TDS MCL is not health based, but is based upon taste and aesthetic concerns. (See, <http://www.epa.gov/safewater/consumer/2ndstandards.html>.) The 500

¹ No surrounding state has included TDS as a water quality standard. Thus, Pennsylvania is the only state in the region to have this voluntary, optional EPA drinking water maximum contaminant level parameter as a water quality standard. In other cases, site-specific TDS water quality standards have been requested and granted. For example, in October 2008, Illinois requested a TDS water quality standard set at 1,686 mg/L for the Lower Des Plaines River and this was approved by EPA.



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mg/l level for TDS was determined as the level above which users of drinking water noticed a different taste of their drinking water and scale on glassware and therefore such levels could discourage drinking water customers from wanting to use the water.

On the other hand, there are established water quality standards, developed by EPA and incorporated into current DEP regulations, for metals and organics with toxic properties. To the extent such pollutants are present in proposed discharges, the National Pollutant Discharge Elimination System (NPDES) permitting program, administered by the DEP, fully addresses the situation by requiring a reasonable-potential analysis (40 CFR 122.44(d)(1); incorporated by reference at 25 Pa.Code §92.2) and development of water quality based effluent limitations (WQBELs) (25 Pa. Code Chapter 96) for the specific uses and particular characteristics of the receiving stream into which such discharges will occur. Adding an end-of-pipe TDS limit will not improve upon this existing permitting process, but will unnecessarily force year round reductions of a much broader category of constituents (i.e., TDS) that may or may not contain such metals and organics at levels of concern.

2. The health of aquatic organisms is protected by the current osmotic pressure water quality standard.

Current water quality standards include a value for osmotic pressure (the parameter that most directly addresses the health of aquatic organisms that can result from increased salinity). It is well established that this osmotic pressure water quality standard must be considered by the DEP in setting WQBELs in NPDES permits and takes into consideration, among other things, the qualities of the particular receiving stream, uses of the stream, mixing zones and seasonal issues. Unlike the proposed end-of-pipe TDS limitation, this specific water quality standard and the established NPDES permitting approach recognize that different types of dissolved solids have different effects. For example, a stream that has limited assimilative capacity for sulfates may be able to assimilate chlorides discharged from a new or existing source. The proposed TDS limit ignores these specific considerations and would require new sources to control all TDS to a maximum concentration of 500 mg/l without consideration of these relevant issues.

3. Each watershed is unique and its assimilative capacity should be considered individually and seasonally. The major source of TDS – acid mine drainage (AMD) – should be addressed and controlled.

As is correctly stated in the proposed rule, at certain times of the year, the levels of TDS in some Pennsylvania streams and rivers can exceed the 500 mg/l TDS water quality standard due to existing discharges of TDS. The proposed solution – an end-of-pipe TDS limit of 500 mg/l imposed upon new sources – does not and cannot correct this situation.



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Most of the TDS affecting the availability of assimilative capacity in the streams of the Commonwealth comes from one source – AMD. AMD is a national problem, and one-third of waters impacted by that problem are located in Pennsylvania; AMD is Pennsylvania’s single largest non-point source water pollutant, impacting 2,500 miles of streams (PA DEP, 1999b). The study conducted by Tetra Tech NUS, Inc. entitled “*Evaluation of High TDS Concentrations in the Monongahela River*” (January 2009) indicates that the high TDS concentrations identified in the Monongahela River in late 2008 were primarily associated with AMD from abandoned coal mines. However the TDS, sulfates and chloride concentrations associated with AMD will not be subject to the proposed regulations. The DEP has indicated that the AMD discharges will continue and will be unaffected by the proposed rule. The MSC urges the DEP to focus its efforts on controlling the treated and untreated sources of AMD. Current facilities used to treat AMD do little to remove high concentrations of sulfates, which is the prevalent constituent found in AMD TDS.

As mentioned above, the proposed rulemaking fails to consider the first element of Clean Streams Law section 5:

“The department, in adopting rules and regulations, ...shall, in the exercise of sound judgment and discretion, and for the purpose of implementing the declaration of policy set forth in section 4 of this act, consider, where applicable, the following: (1) Water quality management and pollution control in the watershed as a whole....”

One possible approach is for DEP to perform waste load allocations (WLA) as part of the NPDES permitting process for new sources of TDS for those watersheds where assimilative capacity concerns exist (25 Pa.Code §96.4). This process takes into consideration existing and future point and nonpoint sources in a watershed, as well as natural stream quality. (See also <http://cfpub.epa.gov/npdes/wqbasedpermitting/wspermitting.cfm> for information related to the development and implementation of NPDES watershed-based permitting approaches.) In addition, the MSC encourages the DEP to consider the implementation of a TDS credit and banking system to allow for the opportunity to encourage reductions from existing point and nonpoint source discharges and allow for use and trading of such credits as part of the ongoing NPDES permitting process.

4. More information is needed concerning TDS trends and impacts before additional regulations are imposed.

The preamble to the proposed rulemaking cites upward trends in TDS concentrations on the Monongahela, Beaver, Shenango, and Neshannock Rivers, and the limited assimilative capacity of the West Branch Susquehanna River and Moshannon Creek, as problems that need to be addressed. Additionally, the DEP appears to be placing substantial responsibility for the TDS



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loadings in the streams of the Commonwealth on the Marcellus Shale industry [See, Permitting Strategy for High Total Dissolved Solids (TDS) Wastewater Discharges (“TDS Strategy”), April 11, 2009, and the focus of the proposed rulemaking], even when the actual drilling in the Marcellus is in its infancy². Also the proposed rulemaking does not take into account the great strides the industry is making in reusing flowback water for hydraulic fracturing operations, thereby reducing the need for wastewater treatment and disposal capacity. The MSC believes the perceived Marcellus Shale water issue and the occurrence of elevated TDS in several rivers and water supply intakes was incorrectly used to justify the Department’s urgent move forward with the proposed changes to Chapter 95.

Several factors may have led the DEP to assume that the Commonwealth has a growing problem with TDS in its waterways related to the Marcellus Shale industry. As noted in the proposed rule, the DEP has received a number of NPDES permit applications for the proposed treatment and discharge of waters associated with Marcellus Shale well development. (See discussion in item 5, below.) In addition, Pennsylvania has been experiencing extreme low river/stream flow resulting in elevated TDS concentrations in several rivers (and subsequently in some water supply intakes). Finally, DEP developed an estimate of anticipated flowback water from Marcellus well hydraulic fracturing operations that is now understood to be overstated by several million gallons per day. The confluence of these circumstances apparently led the DEP to develop and release a TDS Strategy that then led to this proposed rulemaking.

It is clear that, when the TDS Strategy was published, the DEP had an inadequate understanding of conditions and trends in TDS concentrations, and of the sources of TDS and the nature of individual TDS constituents. The MSC strongly encourages the DEP to reevaluate the conditions in Pennsylvania’s streams and rivers to determine if, in fact, there is or will likely be an upward trend in TDS loadings.

5. The number of NPDES permit applications should not be used as a basis for further regulation since these applications are speculative in nature.

On watersheds with reported limited assimilative capacity remaining (e.g., Moshannon Creek and the West Branch of the Susquehanna River), the total discharge loads represented by the new applications for NPDES permits significantly overstate the amount of wastewater that will need to be treated for water produced by the Marcellus Shale industry. Many of the applications were merely speculative, and appear to have been submitted in order to secure a portion of the outstanding assimilative capacity remaining on the watershed. Furthermore, the estimates of anticipated flowback water volumes from Marcellus Shale wells requiring treatment and

² Statewide, 768 Marcellus wells were drilled in 2009 and only 257 had been drilled by the end of 2008.



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discharge are now known to be considerably less than what the DEP originally estimated. As a result of continued development of the Marcellus Shale play, better information is now available regarding these flowback volumes associated with hydraulic fracturing. For example, the MSC has provided information to the DEP that makes clear that flowback volumes per well are significantly lower than were initially projected.

The data indicate that only 15 to 25% of the hydraulic fracturing water is actually returned as flowback water. Furthermore, the level of flowback water reuse is in many cases already at 50% and is growing higher every month as the industry continues to develop and implement reuse strategies and techniques. Innovative technologies continue to emerge for the treatment or conditioning of the flowback water on site or at centralized facilities. Thus, the Marcellus Shale industry's increasing efforts to reuse and recycle these produced waters will reduce the volume of the produced waters requiring treatment and discharge. While the percentage of reuse of flowback water is continuing to increase, not all water will be able to be reused due to local conditions, numbers of wells being completed, location, flowback quality, etc. Those flowback and produced waters that cannot be reused must be able to be treated and discharged without the inappropriate restriction of the proposed end-of-pipe standard.

6. Development of technology based standards and end-of-pipe limits must be done with proper evaluations in place and in accordance with federal and state laws.

Any effluent standards developed by the DEP should be performed consistent with statutory authority and state and federal regulatory requirements. It is clear that, in setting the proposed end-of-pipe standards for TDS, chlorides, sulfates, barium and strontium, inadequate (and perhaps no) evaluation of treatment technologies, costs, availability of treatment equipment, and other relevant factors was performed.

Sections 301 and 306 of the CWA provide that an effluent standard must be established pursuant to "best practicable control technology currently available" (BPT) or the "best available technology economically achievable" (BAT) guidelines. According to a December 28, 2009 notice in the Federal Register (Vol. 74, No. 247), where the US EPA is noticing the availability of preliminary effluent guideline plans for 2010, the EPA states on page 68601:

"The factors considered in assessing BAT include the cost of achieving BAT effluent reductions, the age of the equipment and facilities involved, the process employed, potential process changes, non-water quality environmental impacts, including energy requirements, and other such factors..."

In setting any technology-based standards, the DEP must also follow its own regulations. Specifically, 25 Pa.Code § 92.2d requires that any such standards be developed as set forth at 40 CFR §125.3. Regardless whether the DEP is directly bound by these provisions in proposing



revisions to Chapter 95, it is clear that some evaluation of the appropriateness of the discharge level must be performed and that DEP cannot simply incorporate a water quality standard as an end-of-pipe limitation without such evaluation.

III. Conclusions

In closing, the MSC acknowledges all citizens of Pennsylvania deserve access to clean water for drinking, recreational use, and agriculture purposes. The MSC also promotes the development of the Marcellus Shale to increase economic growth, create jobs, reduce our dependence on foreign fuel, create supply of an environmentally beneficial fuel, and generate revenues for local municipalities and the Commonwealth of Pennsylvania. Due to the considerable, seasonal TDS issues caused by existing sources in Pennsylvania rivers, imposing the proposed Chapter 95 changes will not ensure that the citizens of Pennsylvania will have access to cleaner water. On the other hand, the proposed changes will negatively affect the economic growth of Pennsylvania by reducing the number of jobs that could have been generated, denying local municipalities revenues, and maintaining our dependency on imported fuel.³ The MSC encourages the DEP to carefully and openly study TDS and its constituents in the Commonwealth's waterways and, as deemed necessary based on the results of that transparent analysis, propose regulations which will secure clean water for the citizens of Pennsylvania and allow for the development of the Marcellus Shale natural gas and the health of other industries that provide jobs for its citizens and stimulate economic growth.

Pennsylvania is in a unique position to make a major impact on the energy profile of the nation, through the production and supply of clean and reliable natural gas in close proximity to major markets at affordable prices. But we have not yet secured our place as a leader in shale development in the nation. For example, the rapidly emerging Eagle Ford Shale play in Texas, covering more than 10 million acres, is already capturing the attention of gas companies and investors, which is making it more difficult to attract additional drilling rigs and crews into the Marcellus play. More than ever before, the competition for investment in shale gas is rapidly increasing, and Texas and Louisiana are poised to win the battle because of their modern legislative frameworks and the business climate they have built for industry growth.

With unreasonable regulations such as these proposed amendments to 25 Pa. Code Ch. 95, Pennsylvania is *clearly* sending the signal to the natural gas industry and many other industries that Pennsylvania's current regulators and lawmakers have not grasped the significant negative

³ In addition to the considerable adverse impact these proposed rules, if finalized, will have on the Marcellus Shale industry, we note that the proposed standards will also have widespread impacts to numerous other businesses and industries throughout the Commonwealth. We draw the Board's attention to the comments submitted by the Pennsylvania Chamber of Business and Industry on these same proposed rules.



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impacts these regulations will have on the Commonwealth's economy now and in the future. The MSC strongly encourages the DEP to better understand the nature of the TDS issue throughout the Commonwealth and, if necessary, craft reasonable regulations that target the actual cause.

As an Associate Member of the MSC, we at Tetra Tech thank you for the opportunity to comment on these proposed rules.

Sincerely,

Stephen Hughes PE
Design Engineering Manager

Mark Speranza PE
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