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March 12, 2010

Stephen W. Rhoads
Chairman, PADEP Water Resources Advisory Committee
Director of External Affairs
East Resources, Inc.
301 Brush Creek Road
Warrendale, PA 15086

Re: Draft Chapter 95 Regulations

Dear Steve:

As you know, on November 7, 2009 (and November 14, 2009) draft amendments to 25 Pa. Code Chapter 95 were published in the Pennsylvania Bulletin ("Draft Chapter 95 Regulations"). The stated purpose of the Draft Chapter 95 Regulations is to eliminate new sources of high Total Dissolved Solids ("TDS") wastewaters from the Commonwealth's waters by January 1, 2011. 39 Pa. Bull. 6467 (November 7, 2009).

Prior to their publication in the Pennsylvania Bulletin, the Pennsylvania Water Resources Advisory Committee ("WRAC") reviewed the Draft Chapter 95 Regulations over the course of two meetings in the summer of 2009. At its July 15, 2009 meeting, WRAC adopted the following recommendation regarding the Draft Chapter 95 Regulations:

> WRAC recognizes and fully supports the protection of all of the Commonwealth's surface and ground waters. However, from the commentary received at WRAC's June meeting and today's discussions, it is clear that the Draft Chapter 95 Regulation to limit the discharge of total dissolved solids and several other pollutants affects not only the quality and uses of the Commonwealth's waters but also many different sectors of Pennsylvania's economy.
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> WRAC believes that the ramifications of the Draft Chapter 95 Regulations are wide ranging and have not been adequately analyzed by the Department. Specifically, WRAC believes that the draft regulation needs to be supported by science. Among other things, the Department needs to analyze more fully the surface water impacts of existing high TDS discharges, potential water quality impacts from new high TDS discharges, the treatment technologies needed to achieve compliance, and the impacts of the regulation on energy consumption, air emissions, residual waste generation and disposal, mine-land reclamation, and the economic impacts on the development of the Marcellus Shale and other affected sectors of Pennsylvania's economy.
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> Rather than proceeding to public notice with a proposed rule, WRAC recommends that the Department work in conjunction with WRAC to form a statewide stakeholders group to analyze the issues and develop appropriate solutions. This approach was very successful in

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developing the Department's "Water Quality Antidegradation Implementation Guidance," and WRAC believes that it can be successful in this instance, too.

In the interim, WRAC encourages the Department to use the full range of regulatory resources at its disposal to ensure protection of the existing and designated uses in the Commonwealth's receiving streams.

The Draft Chapter Regulations were presented to and adopted by the Environmental Quality Board ("EQB") at its August 18, 2009 meeting. However, in response to the July 15th recommendation, the Department and WRAC cooperatively worked to form a TDS Stakeholder "Chapter 95 Task Force". The goal of the Chapter 95 Task Force was to identify the impacts of the proposed effluent limits on regulated discharges and to develop recommendations on the alternatives and options available to address the TDS concern.

The Task Force met on August 27, September 22, October 16, November 10, December 11, 2009, and January 13, 2010. During the course of those meetings, the Task Force attempted to focused on two primary tasks: (1) evaluate the impacts of historical, current and projected TDS loads and on the quality and uses of the receiving waters; and (2) identify and evaluate potential options available for controlling TDS, while minimizing secondary environmental, energy and economic impacts and the associated costs. The sector groups represented on the Task Force (Natural Resources, Utilities, Municipals, Industry & Manufacturing, Mining and Oil & Gas Industry) presented summaries of the potential impacts of the proposed regulations on each sector along with options and cost for compliance. The sector presentations are available on the WRAC webpage. (http://www.depweb.state.pa.us/portal/server.pt/community/water_resources_advisory_committee_%28wrac%29/14017/wrac_taskforce_on_chapter_95/631764

The Task Force discussed the proposed regulations at length, including but not limited to:

a. Appropriateness
b. Economic impact
c. The technologies needed to meet the proposed effluent limitations
d. The nature and extent of water quality data being utilized to describe the impacts on water quality in various drainage basins (including the Monongahela River)
e. Terms and definitions
f. Natural resource impact
g. Application of the regulation to various sectors

The positions and opinions of the members regarding the proposed regulations ranged from support for the PADEP's proposal to recommending that the PADEP not pursue the proposed amendments. The Task Force was not able to arrive at any consensus options or recommendations. The following comments and suggestions do not represent a consensus among the members nor an endorsement by the Task Force as a whole.

Concerns with Draft Chapter 95 Regulations from the Regulated Dischargers Sectors

- To be effective, Pennsylvania's TDS strategy must be developed with an accurate understanding of the specific streams evidencing TDS challenges, the specific constituents and hydrologic conditions that lead to TDS issues, and the primary sources of those constituents

and loadings. The primary rationale for the statewide end-of-pipe standard proposed in Ch. 95 appears to be the observation of TDS challenges in a limited number of streams (such as the Monongahela River) many of which are predominantly impacted by abandoned mine discharges, and the observations of elevated TDS conditions were limited to extreme and extended low flow conditions. The studies and surveys cited in the TDS Strategy and shared with the Chapter 95 Task Force do not indicate a statewide TDS "problem" but rather suggest an issue that affects specific streams and stream reaches under certain hydrologic conditions. A close examination of those studies further indicates that the sources and challenges in each watershed are different, and one across-the-board "solution" may not be efficient or effective.

- The number of applications for discharge of "treated brine water" with high TDS levels in the West Branch of the Susquehanna River, as well as anticipated discharges of brines in other drainage basins created concern for the Department. The Department's preliminary estimates of the volume of produced wastewater expected to be generated by the Marcellus shale gas development added to the concern regarding high TDS discharges. However, current industry field data from Marcellus shale well operations indicates that actual wastewater generation amounts to only 20 to 25% of the Department's preliminary estimates. Further, industry is beginning to mix most of the higher TDS flowback water with other water supplies for use in subsequent frac operations. If industry can expand its ability to recycle and reuse produced water flowback without long-term impacts on natural gas production levels, the volume of wastewater that will ultimately need to be disposed of could amount to 10% or less of the preliminary estimates.
- The Department has not presented a rational connection between the perceived or potential problems and the proposed amendments to Chapter 95. A review of the PADEP's water quality monitoring data, used to support the need for the amendments, raised questions regarding the true severity of the TDS issue.
- A comprehensive analysis of the impacts from the proposed amendments on existing dischargers has not occurred. Several Task Force members had concerns regarding the definition of "new" or "existing" discharges and how existing discharges would be impacted by the proposed amendments. The concerns resulted from the perceived potential for a change in or expansion of a manufacturing or industrial process that may require a significant increase in treatment costs. The proposed definition of "High-TDS sources" sweeps in a wide range of industrial enterprises, far beyond those mentioned in the TDS Strategy, including electric power generation, petroleum refining, chemicals manufacturing, iron and steel manufacturing, pharmaceuticals, meat packing, food processing, and others. Before adopting and implementing the type of treatment limits as set forth in the proposed Ch. 95, DEP should develop an accurate understanding of the numerous sectors affected by the limits, along with the technical and economic feasibility of implementing the proposed TDS limits in each of those sectors.
- The direct and indirect costs of additional TDS treatment are significant. The sector presentations contain estimates for the capital and operating costs for TDS treatment. The costs were significantly higher than the $0.25/gallon the Department references in the preamble.
- Questions remain on the technical feasibility of treatment and the treatment options available. The technologies available to address high-TDS wastewaters are limited, subject to varying

capabilities depending on the matrix of constituents in individual wastewaters, and pose significant technical and economic feasibility issues.

- The available treatment technologies are energy intensive and could have unintended impacts to the environment, including concerns over disposal of residuals created as by-products of treatment.
- The Task Force notes that as drafted, in many watersheds the potential exists to expend large amounts of effort and money on treatment with little impact on in-stream TDS levels.
- It will be impossible for a planned or proposed manufacturing or industrial development which may generate high TDS wastewater to comply with the Department's stated goal of January 1, 2011. Further, an existing industrial facility that had long-term business plans to expand their facility may seek to move or relocate its production units out-of-state. Thirty-six months is the best case time estimate for obtaining all required approvals and permits for a high TDS treatment facility. It could take an additional 24 to 36 months to construct the facility and bring it into operation. The proposed regulations are a deterrent to the expansion of existing or development of new businesses in the Commonwealth.
- Additional consideration is necessary to more clearly link the limits the rule proposes on concentrations with the limits on daily loadings.

Natural Resource Sector Comments

- The best approach to ensure water quality protection is an end of pipe discharge standard such as DEP has proposed in revisions to Chapter 95. This approach ensures both watershed protection and equity between private interests and regions of the state.
- It is critical that any regulation developed ensure that there is in-stream protection for aquatic life for TDS, chlorides, and sulfates. Protections at the point of discharge are critical to ensuring both aquatic life and drinking water protection.
- Large, untreated discharges of high TDS wastewater should be eliminated. Mechanisms such as trading should not result in the continuance of large untreated TDS discharges which can impact either local aquatic life or nearby drinking water intakes.
- Treatment systems that can meet DEP's proposed Chapter 95 standard are being constructed in both West Virginia and Pennsylvania, demonstrating that the technology is feasible and economical.
- There are significant economic benefits to the adoption of the proposed regulation. Tourism, the second largest industry in the state at $28 billion annually, has many sectors dependent on high water quality. Other industrial sectors additionally are dependent on sufficient water quality. The lack of an end-of-pipe discharge standard can result in treatment costs being borne by drinking water systems rather than wastewater dischargers.
- Water quality standards for chlorides and sulfates need to be implemented in addition to the Chapter 95 revisions. The existing osmotic pressure standard is not an equivalent protection.

Proposed Course of Action

Members of the Chapter 95 Task Force representing regulated dischargers suggest that DEP evaluate a 2-prong course of action in lieu of proceeding with the Draft Chapter 95 Regulations. The 2 prongs are as follows:

1. Monitor TDS loadings in Commonwealth streams, and undertake actions on a watershed-specific basis when loadings and trends (including new or increased discharge proposals) indicate a significant threat to assimilative capacity.
2. Oil & Gas Industry Wastewater Recycling and Reuse Strategy
    - Require Marcellus Shale operators to optimize the recycling and reuse of produced water flowback[1] whenever practicable.
    - Provide the regulatory framework to encourage industry-wide recycling and reuse of Marcellus Shale produced water flowback.
    - Require that Marcellus Shale produced water flowback that cannot be recycled or reused either: (a) receive an acceptable level of treatment/pretreatment at a commercial or industrial wastewater treatment facility or publicly-owned treatment works under an approved DEP permit prior to being discharged to surface waters, (b) be managed and permitted pursuant to the US EPA Underground Injection Control Program, (c) use treatment technologies that do not discharge to the waters of the Commonwealth, or (d) use the wastewater for any beneficial use authorized by the Department.

This course of action could protect the Commonwealth's surface and ground waters from the potential adverse impacts of new high-TDS wastewater discharges and minimize the potential adverse affects to the environment, the Commonwealth, and the citizens of Pennsylvania. TDS management techniques which could be utilized to address loadings on a watershed basis include:

- Establish arrangements for TDS constituent trading and banking, allowing major new or increased discharges (defined by loadings) to offset new loadings through corresponding reductions in existing loadings within the watershed, subject to near-field water quality standards.
- Work with dischargers to develop site-specific TDS loading and discharge reduction strategies and management programs.
- Allow acceptance and treatment at POTWs who are capable of accepting such wastewaters without interfering with the POTW's treatment process.

Managed Discharges

It appears that certain types of discharges may be interruptible or significantly curtailed. That is, the wastewater generating activities are of a type that can be reduced or suspended for a period of time, or wastewaters may be held in storage or diverted to another watershed, when the High TDS Watershed is experiencing low-flow conditions and attendant TDS concerns. Examples of potentially interruptible or managed discharges include (i) discharges from some deep mines, where AMD may be held back and stored in mine pools; (ii) certain oil and gas produced fluids, which may be stored in tanks or

[1] Wastewater generated from fracturing, production, field exploration, drilling, or well completion from Marcellus Shale operations.

impoundments at or near the well drilling site or diverted to other treatment facilities for some time period; and (iii) some power plant scrubber operations.

Managed discharges and the other management techniques presented do not include all possible options or approaches for addressing TDS issues.

Concerns with Proposed Course of Action

The Natural Resource Sector raised a number of concerns regarding the proposed "Course of Action" described above:

- There is a clear difference of opinion on whether there are enough water quality concerns, both present and future, to warrant a statewide discharge standard versus a targeted watershed approach.
- While there may be environmental benefits to the recent application by the Marcellus Shale drilling operators of reuse of wastewater as a water supply for fracturing new wells, there is a need for DEP to fully analyze the approach and determine what rules exist or are needed to regulate this activity to assure the proper fate of the wastewater.
- Mechanisms such as trading or mitigation banking should not result in the continuance or establishment of large untreated TDS discharges which can impact either local aquatic life or nearby drinking water intakes.
- While the managed discharge options can be explored there needs to be more quantitative data and analysis presented to determine the viability of this option.

Conclusions

The Task Force encourages WRAC and the Department to review the sector presentations found on the WRAC webpage for more detail on the discussions of the Task Force.

The Chapter 95 Task Force appreciates the opportunity to present these findings and recommendations to WRAC, and it hopes that WRAC will forward this letter to the Department for its consideration. The TDS Stakeholder Task Force also wishes to extend its appreciation to the following individuals:

- To Department representatives John Hines, Dana Aunkst, and Marcus Kohl for their leadership and spirit of cooperation
- To all of the non-WRAC members who graciously volunteered their time and effort to participate in the process

Sincerely,

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