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Sustainable Water Infrastructure Task Force Final Report
Innovative Measures Workgroup
Workgroup Overview

Problem Statement

The Innovative Measures Work Group was established to examine the projected cost savings realized by the consideration and implementation of all available non-structural alternatives to include examining the effectiveness of trading.

The Work Group addressed the issues of Rates (in support of the Needs Assessment Work Group), Design and Technology, Laws and Regulations (in limited areas), Public Education, Stormwater Pollution and Better Use of and Protection of “Green” Infrastructure, and Energy.

We applied the following definition:

Definition of Sustainable Water Infrastructure – A managed program of resources to allow operation, maintenance, repair and replacement of the installed water and wastewater base that achieves balance between efficient operations (costs of capital, labor, electricity, chemicals, sludge disposal) with adequate rates to cover needs of the system that remain affordable to ratepayers, without unreasonable or exclusive reliance on state and federal grants or unreasonably adverse economic impact on affected households and businesses.

Workgroup Membership

E. Charles Wunz, Chair, Herbert, Rowland & Grubic, Inc.
Scot Boyce, LTS
Karl Brown, State Conservation Commission
Eric Conrad, E. R. Conrad & Associates
George Crum, SW Delaware County Municipal Authority
Joanne Denworth, Governor’s Office
Jim Dougherty, MWN/Industrial End User
Ellen Ferretti, PEC, Pocono Forest and Waters Initiative
Grant Gulibon, PA Builders Association
Joyce Hatala, Joyce Hatala Associates
Sally Holbert, Land Logics Group
Christine Hoover, Office of Consumer Advocate
Terry Kauffman, Mount Joy Borough Authority
Marc Lucca, Aqua PA
Paul Marchetti, PENNVEST
Richard Marcinkevage, City of Lock Haven
Barry Naum, MWN/Industrial End User (Alternate)
Jodi Reese, CET Engineering Services
Richard Sands, URS

Representative Stan Saylor, House of Representatives
Bob Schnitzler, PA American Water
Bill Shuffstall, Penn State Cooperative Extension
Nathan Silcox, Senate Local Government Committee
Chris Toms, C.S. Davidson, Inc.
Darlene Wong, Office of Consumer Advocate
Paul Zielinski, PA American Water

Paul Zeph, DEP Liaison Support

Short biographies of the members are attached in the Appendices.

Action Agenda

The following recommendations are based on the concepts assigned to the Work Group. A complete list of Work Groups' concepts, as a result of the brainstorming sessions, is attached in the Appendices. Several Work Group Members have also added additional commentary to several concepts which are located in the Appendices.

Rates¹

Problem Statement

Many municipal and municipal authority system rate structures do not incorporate a capital reserve or depreciation component. The result is that many systems have not accumulated a capital reserve and therefore rely on state funding for their next infrastructure project. In addition, artificially low rates do not reflect the true cost of business and educate consumers that water and wastewater service is cheap and always should be. The Work Group does not assert that adequate rates will fully eliminate the need or desirability of state assistance in support of certain projects which reflect the value to society of adequate water and wastewater service.

Short Term Solutions

- Require true cost of business rate making for all non-PUC regulated water and sewer service providers who receive state grants or loans. In the short term, a temporary definition of true cost of business would be sufficient revenue to cover all operations and maintenance costs and debt service plus 10 percent of that amount for funding a capital reserve which would be used exclusively for future infrastructure investment.
- Require all non-PUC regulated water and sewer service providers who receive state grants or loans to establish a utility assistance program whereby low

¹ Rates issue was assigned to Needs Assessment Work Group. The importance of Rates issue is reinforced by commentary provided here by Innovative Measures Work Group.

income customers² would receive assistance in the case of low income or short term hardship to allow those customers to pay their water and sewer bills.

Long Term Recommendations

- Develop appropriate legislation and/or regulation to establish detailed procedures for rate making standards and for calculating the true cost of business and to require that all non-PUC regulated water and sewer service providers establish such rates within 5 years. Consideration should be given to incorporating the following two issues:
 - Reflect in the rate structure measures to encourage equalization of wastewater discharge and water demand as a method to reduce demand on existing infrastructure.
 - Establish rate mechanisms for both water and wastewater systems that recognize and incorporate incentives for conservation methods, curtailable usage, and reuse.

Design and Technology

Problem Statement

Pennsylvania needs to encourage use and correct application of innovative technology. Without such encouragement, it is unlikely that the lowest cost and greatest benefit to society will occur. Some innovation exists, but innovation is not common because it is not encouraged.

Short Term Solutions

- By policy establish minimum standards for the development and alternatives analysis for required infrastructure and require selection of lowest present worth as a condition for receiving state or federal grants, or loans. Standards could include service life, repair costs, energy consumption, chemical requirements, and operational requirements such as special licenses/certifications.
 - Develop and distribute on a regular basis a list of alternate technologies that should be considered for various types of water and wastewater infrastructure projects.
- Establish within the appropriate standing DEP advisory committees a subcommittee charged with identifying and analyzing new technologies.

² It is acknowledged that many publicly owned water and wastewater systems bill the property owner and not the resident. Nonetheless, it is reasonable to assume that the cost of the bill is passed on to the resident in his rent and relief remains desirable.

- Appoint private/public subcommittees within the appropriate standing advisory committees to update the major technical guidance documents to reflect an emphasis on the use of new and emerging technologies and the discarding of old and no longer appropriate guidelines.
- Prepare an annual report on successful innovative technology projects.
- Employ private contractors to evaluate the technical and design aspects of each project above a predetermined dollar amount for which state or federal grant and loan monies are sought to assure that the most cost effective solution has been selected.
- Require the study and implementation of water reuse for all new development including all special protection watersheds.
 - Encourage retrofit to water reuse where projects such as golf courses, parks, etc are near water reuse sources, e.g., within 0.25 miles.
- Establish design and construction standards for individual water supply wells.
- Require the inspection and correction of deficiencies in lateral, building sewer, and water service lines at time of real estate transfer. This would also be an opportunity to mandate installation of water conserving fixtures, such as shower heads, low-flow toilets, etc.
- Extend the planning period for water and wastewater planning to 50-years and require 5-year implementation plans with 5-year planning updates for all municipalities that are served by public or private sewer systems. Plans should also specify funding sources for planned projects.
- Regarding infiltration and inflow (I/I):
 - Similar to limits imposed for water loss in water distribution systems, establish maximum I/I allowance thresholds and if system exceeds threshold, limit funding to the portion of a project which is below the threshold.
 - Mandate the use of low pressure sewers for new sewer construction in special protection watersheds as a means to limit the volume of wastewater treated.
 - Develop and enforce strict limits for leakage in new sewer construction and new sewer line, manhole, lateral and building sewer construction and extend the requirement for the engineer's certification to require a certification regarding the integrity of the sewer system at both one year and the fifth year after completion of construction.
 - Extend the requirement for Chapter 94 reporting to all sewer systems eligible to receive state assistance.
- Condition new developments on completion of long-term plan that shows in-tract and out-of-tract impacts, infrastructure needs and water and sewer resources are funded and available.

Laws and Regulation

Problem Statement

Water Quality Trading is a practice used in some states to reduce the cost of compliance. Typically implemented in TMDL watersheds, the concept has been introduced in the Chesapeake Bay area as a part of the Chesapeake Bay Tributary Strategy. The savings to society in implementing trading in other areas is not known, but is believed to be substantial.

Short Term Solutions

- Undertake a study to identify all the opportunities that exist in Pennsylvania where trading might be utilized as a method for water quality compliance at a lower cost than the traditional building.
- Undertake a comprehensive review of the Chesapeake Bay Nutrient Credit Trading program to determine its effectiveness and any improvements that might be implemented. Specific questions to be answered are:
 - Extending the life of credits to the length of time that nutrients remain in the Bay. Currently credits expire at the end of the water year in which they are generated.
 - Establishing a trading bank to enhance the confidence in trading.
 - Establishing a cap price for credits and a stipulated penalty if credits are not purchased. Providing a cap on future credit prices enhances the desirability of trading. The innovation of the concept leads to uncertainty of future price and availability of credits which reduce trading desirability.
 - Should trading be made mandatory if it results in a lower cost of compliance?
 - Utilize all fines and stipulated damages assessed for noncompliance for credit generating activities.

Long Term Recommendations

- None.

Public Education

Problem Statement

The public believes that water and wastewater service should be cheap. They do not understand the true costs or the true value of providing water and wastewater services in protecting the public health and the environment.

Short Term Solutions

- Provide education to gain public support and recognition that infrastructure upgrades are necessary to sustain quality of life and that there are costs associated with these upgrades.
- Educate current and future users
 - Introduce general aspects of water/wastewater into elementary, middle and high school science curriculum
 - Provide tours of systems for all students
 - Develop relationships with community colleges, universities and vo-tech schools to train future water/wastewater professionals
 - Promote water/wastewater conservation through education and incentives
- Reduce nutrient runoff
 - Educate public on proper fertilizer use on lawns and gardens
 - License/educate commercial lawn care providers
- Make the public, system managers, and design community aware of successful examples of innovative measure applications (e.g. University Area Joint Authority).

Long Term Recommendations

- Provide funding to evaluate how measures such as water reuse, conservation, and low-impact development will impact the social order.
 - Educate the public on those impacts
- Encourage innovative measures in design and construction that reduce consumption and environmental impact
 - Aquifer recharge
 - Water reuse
 - Conservation education
- Educate/retrain system designers to recognize the following:
 - Alternatives to centralized plants
 - Water reuse potential
 - Innovative measures from other states
 - Innovative measures from other countries
- Establish a clearinghouse/information repository or informational committee to assemble, organize, and distribute information on innovative measures to system managers and design community.

Stormwater Pollution and Better Use of and Protection of “Green” Infrastructure

Problem Statement

In many watersheds, stormwater discharge has a measurable negative effect on receiving surface waters, yet until very recently, the focus has been on dealing with the quantity and flow rates of the flow and not with its quality.

Short Term Solutions

- Require statewide public education programs highlighting the concept that the watershed and water quality start at the catch basin, similar to the “Bay starts here.”
- Extend MS4 permitting to all stormwater systems located in special protection and all non-attainment watersheds.
- Begin the development of water quality standards for stormwater discharges, particularly the first flush and encourage the construction of wetlands to capture and treat the first flush through state financial assistance to several demonstration projects located throughout Pennsylvania.
- State should invest funding in urban tree planting, riparian buffer protection and restoration, installation of rain barrels and cisterns, rain gardens, and green roofs. Provide workshops on these topics. Work with Soil Conservation Districts, Penn State Extension Office, local colleges and universities, PA Department of Education, and local garden clubs to host workshops and provide education.

Long Term Recommendations

- Encourage the formation of “Storm water Enterprise Agencies” within the water and wastewater community to integrate planning and services. These should be regional in approach and work with county planning commissions.

Energy

Problem Statement

Wastewater treatment plants are the largest municipal and municipal authority owned electric energy consumers. They employ technology developed at a time when energy was cheap and the cost of biosolids disposal minor.

Short Term Solutions

- Incorporate energy analysis as a required element of Act 537 Planning.

- Initiate training seminars throughout Pennsylvania of energy saving approaches.
- Encourage the implementation of anaerobic treatment technologies for wastewater and biosolids treatment through training seminars and small grants, say \$10,000 each.
- For water systems provide small grants, say \$10,000, each for water systems to study the viability of the recovery of hydraulic energy.

Issues

The Innovative Measures Work Group believes that innovation is required if Pennsylvania is to successfully address its water infrastructure sustainability problems. Over the last 20 years or so, innovation has been neither encouraged nor rewarded. Complacency has settled over water infrastructure providers and regulators. All aspects of providing water infrastructure, many of which we have inherited from the 1950's and 1960's, need to be re-examined and revised to assure excellence in providing required water infrastructure.

Adequate planning to assure sustainable water infrastructure is lacking. There is no statewide requirement for water infrastructure planning and Act 537 planning focuses on municipalities and not on watersheds. Regional solutions are not encouraged and as a result, Pennsylvania has too many small water and wastewater systems, some of which may need to be taken over by larger systems. There is no requirement for budgeting a capital reserve component into rate making. As a result there is an excessive reliance on state financial support. In addition, there is no definition of affordable rates and together with a lack of public education and understanding there is an unreasonable expectation of the public for rates priced below the cost of sustaining existing infrastructure.

The Innovative Measures Work Group supports an intense effort of short and long term study and implementation.

Design and Technology

Definition of Issue

New developments in treatment technologies are largely aimed at addressing new treatment and water quality requirements and not at providing the same level of treatment at lower cost. There are a few exceptions to that rule, SBR technology was largely sold based on costs savings, but those savings have not been proven. The Cannibal™ process as a means to reduce biosolids production and side stream treatment for nutrient removal may be exceptions to that rule.

Innovation therefore lies equally with the development of new technology and the implementation of the right technology. It also lies more with the appropriate rules and regulations to encourage the application of the right technology.

The greatest focus of innovation lies in adequate planning which current do not always occur. In addition, standard practices in other states, like water reuse, need to be encouraged and/or mandated.

In addition, certain levels of technological performance need to be mandated and maintained.

Overview of Public Input

EMARR has suggested that Hazleton CSO's be discharged through limestone treatment units to acid mine water pools in an effort to address both the CSO and AMD issues.

The MRSA is proposing the world's first wastewater to energy POTW by incorporating anaerobic treatment and resulting biogas harvest into its new treatment plant.

Both projects are very innovative and should be supported by Pennsylvania.

Law and Regulation

Trading is an established compliance tool in air pollution and in TMDL watersheds. In the water environment, it is a viable tool where water quality governs, but where local hot spots are not a concern. Given the many wastewater treatment plants in Pennsylvania, there are many instances of interaction between several discharges. In those cases, trading may be viable.

On the water infrastructure side, there may be opportunities for trading of some regulatory limits, like withdrawals from a watershed that would allow greater flexibility in source of supply.

In cases where trading is viable, the question becomes whether trading should be optional or mandated. In cases where state funding assistance is sought to support wastewater infrastructure projects the appropriately defined lowest cost of compliance should be required.

The Chesapeake Bay Tributary Strategy trading program has been introduced to be market based and involves trading between credit generators and those who need credits. DEP only approves the trades. Many have voiced the need for a credit bank and a set price for credit purchase in order to allow greater assurance in the selection of the trading option over the option of building nutrient removal infrastructure.

Public Education

Definition of Issue

The lack of public recognition of the need to maintain and upgrade systems to sustain or improve quality of life, public recognition of/interest in water conservation; lack of public understanding of water as one resource, whether storm water, drinking water, wastewater or acid mine drainage, groundwater or surface water; and the lack of understanding by professionals of benefits of innovative practices, alternative solutions, water reuse and low impact development

Overview of Public Input

To promote water conservation and educate the public and provide incentives to conserve; promote protection through innovative measures that recharge aquifers, promote reuse, conservation and education for environmental protection; look to other counties and states for innovative measures; and educate designers on effectiveness of alternative solutions to building or treatment plant

Options Considered

Education of General Public and Future Users by introducing water/wastewater issues into school curriculum through Pennsylvania Department of Education.

Through DEP, develop handout/mailings tailored to the:

- General Public
 - Need for continued investment in infrastructure through rates
 - Water is one resource, reusable, conservable and limited
 - Conservation reduces costs to all users – provide examples and guidance
 - Reduce fertilizer use/loss through proper application
- System Managers & Operators
 - Innovative measures available – provide successful examples
 - Watershed protection, water conservation, and water reuse reduce costs - provide examples and guidance
 - Assist in providing system tours
- Design Professionals
 - Define/illustrate innovative measures – provide successful examples
 - Provide sources of information on innovative measures (Committee or Clearinghouse).
 - Initiate contacts with vo-tech and higher education facilities to encourage/develop training for future operators -Initiate internship programs between educational providers and local system operators
 - Approach water/wastewater state and national associations and users groups to assist with preparation/distribution of materials and with development of educational and training programs

Biographies

Wunz, E. Charles

Mr. Wunz is a graduate of The Pennsylvania State University with a Bachelor of Science and a Masters in Agricultural Engineering. Mr. Wunz is the Executive Vice President of Herbert, Rowland & Grubic, Inc., where his primary responsibilities include the management, supervision, and monitoring of all environmental projects and he specializes in private and public water and wastewater infrastructure projects. Mr. Wunz has extensive experience in planning, design, bidding, construction, financial analysis, value engineering, federal and state funding, and permits and related applications. He is a recognized engineering expert witness in cases related to water and wastewater infrastructure improvements and their impact on user rates.

Mr. Wunz is a registered Professional Engineer in several states including Pennsylvania.

Boyce, Jr., Scot F

Mr. Boyce is a graduate of Mansfield University (PA) with a Bachelor of Science in Geography, Environmental Science Emphasis, Minors in Geology and Regional Planning. Currently, Mr. Boyce is employed by LTS Builders in East Stroudsburg, PA, as a Manager, Soil & Terrain Analysis, where his primary responsibilities are research new technologies and conservation methods and conduct wetland delineations.

Mr. Boyce is a PA DEP certified Sewage Enforcement Officer; conducts soil testing for on-lot sewage systems and on-lot storm water infiltration areas as well as designing systems.

Brown, Karl G.

Mr. Brown is a graduate of The Pennsylvania State University with a Bachelor of Science in Environmental Resource Management. Currently, Mr. Brown is employed with the Pennsylvania State Conservation Commission as an Executive Secretary. His responsibilities include the overall management of Commission programs and activities, including nutrient management, dirt and gravel road maintenance, Resource Enhancement and Protection Tax Credits, and others.

Conrad, Eric R.

Mr. Conrad is a graduate of New England College with a Bachelor of Arts in Geology and The Pennsylvania State University with a Masters of Urban and Regional Planning. Currently, Mr. Conrad is the President of E.R. Conrad & Associates, LLC. The company provides services for environmental planning, energy and water conservation practices, green building strategies, permitting and compliance assistance. The company provides expert advice to help clients address unique situations where

traditional approaches to problem solving have proven inadequate in meeting local, county, state or federal guidance or requirements.

Mr. Conrad also teaches college level science courses at the PSU Harrisburg campus, in Middletown, PA, in environmental geology and energy conservation.

Mr. Conrad is a registered Professional Geologist.

Crum, George

Denworth, Joanne R.

Ms. Denworth is a graduate of Vassar College and the University of Pennsylvania Law School. Ms. Denworth is an attorney who works in the Governor's Policy Office with state agencies on policies and programs relating to land use, community and economic development, environmental protection, transportation, water & sewer infrastructure, agriculture, parks, recreation, conservation and historic preservation. She has been a judge on the Environmental Hearing Board; worked in private practice on land use, environmental, and community development matters; served as president of the Pennsylvania Environmental Council for 12 years; and was the founder and president of 10,000 Friends of Pennsylvania for 4 years before coming to Harrisburg.

Ms. Denworth is the author of several books and many articles on land use, development, governance and environmental topics.

Dougherty, Jim

Ferretti, Ellen

Ms. Ferretti is a graduate of Wilkes College with a Bachelor of Science in Environmental Science. Currently, Ms. Ferretti is employed with Pennsylvania Environmental Council as a Vice President of Pocono Forest and Waters Initiative and Special Assistant to the President. She serves on the State Planning Board, Luzerne County Planning Commission and DCNR's Citizen Advisory Committee.

Gulibon, Grant

Mr. Gulibon is a graduate of Saint Vincent College with a Bachelor of Science in Economics and from the H.J. Heinz III School of Public Policy and Management, Carnegie Mellon University with a Masters in Public Policy Analysis. Mr. Gulibon serves as Regulatory Specialist with the Pennsylvania Builders Association, a nonprofit, professional trade organization representing 9,600-plus member-companies from across the state. In this capacity, he works with state legislative and regulatory agencies to advance the regulatory affairs priorities of the housing industry.

Hatala, Joyce

Ms. Hatala is a graduate of the University of Notre Dame with a Bachelor of Arts in Anthropology; and from the University of Minnesota with a Masters of Arts in Anthropology/Ecology. Ms. Hatala recently began her own business, Joyce Hatala Associates, with an emphasis on environmental projects and grant writing. She is vice-chair of the Department of Environmental Protection's Citizens Advisory Council (CAC), and the Solid Waste Advisory Committee (SWAC). She previously held the position of Lackawanna County Recycling/Solid Waste Coordinator, and the Environmental Institute Director at Lackawanna College.

Holbert, Sally M.

Ms. Holbert is a graduate of the University of Arizona with a Master of Landscape Architecture and from Indiana University of Pennsylvania with a Bachelors of Science in Geology. Ms. Holbert is the founding principal of Land Logics Group, a firm offering innovation in community planning and land development process and design. The firm uses a collaborative community process to plan, design and code livable neighborhoods, cities and regions offering alternatives to sprawl land development patterns.

Ms. Holbert areas of interest are focused on strengthening the redevelopment of existing towns, providing tools for the preservation of prime farmlands and other lands identified as key natural assets, shaping new mixed use neighborhoods and conserving important community open spaces. Sally applies her 20 plus years of experience with advanced spatial analysis technologies (GIS) to assist clients with problem solving and decision making in various project environments. She has applied experience in land use and community planning, green and gray infrastructure management and natural resource applications.

Ms. Holbert is a registered professional landscape architect.

Hoover, Christine

Kauffman, Terry L.

Mr. Kauffman is a graduate of The Pennsylvania State University with a Bachelor of Arts in Agriculture Business. Mr. Kauffman is currently employed as the Borough Manager/Authority Administrator for Mount Joy.

Lucca, Marc A.

Mr. Lucca is a graduate of Temple University with a Bachelor of Science in Engineering Technology and The Pennsylvania State University with a Master in Engineering. Currently, Mr. Lucca is Vice President, Production for Aqua PA. His responsibilities include overseeing the treatment and reliability in the surface water plans and wells throughout the company's service territory.

Mr. Lucca is a licensed engineer in several states including Pennsylvania.

Marchetti, Paul

Marcinkevage, Richard W.

Mr. Marcinkevage is a graduate of The Pennsylvania State University with a Bachelor of Science in Civil Engineering. Currently, Mr. Marcinkevage is the City Manager for the City of Lock Haven. His responsibilities include overseeing the daily operations of the City's water system, sewer system and sewage treatment plant.

Mr. Marcinkevage is a registered professional engineer and had previously served as the City's Engineer prior to becoming the Manager.

Naum, Barry A.

Mr. Naum is a graduate of the Ohio State University Moritz College of Law, and is currently employed with McNees Wallace & Nurick LLC, as an attorney practicing in the Energy, Communications, and Utilities Practice Group in Harrisburg. Responsibilities include practicing water, wastewater, telecommunications, electric, and natural gas law, primarily representing industrial and large commercial customers before the Pennsylvania Public Utility Commission.

Prior to entering the practice of law, served as a U.S. Army cavalry officer in Operation Iraqi Freedom, in part assisting Iraqi communities with resolving significant water and wastewater infrastructure problems. Currently holds a commission as a Captain in the Army National Guard.

Reese, Jodi L.

Ms. Reese is a graduate of West Virginia Wesleyan College with a Bachelor of Science in Computer Science and The Pennsylvania State University with a Master of Science in Environmental Pollution Control. Currently, Ms. Reese is employed with CET Engineering Services as a Professional Engineer. Her responsibilities include the design and operational aspects of municipal and industrial wastewater treatment facilities, evaluating treatment facilities for operational optimization, including microscopic examinations for biological processes and alternatives evaluations for upgrades and expansions.

Ms. Reese has instructed several classes on wastewater treatment for virtually all types of treatment processes. She is also extensively involved in evaluating the impacts of Pennsylvania's Chesapeake Bay Tributary Strategy. Her knowledge of the bay strategy and understanding of the associated regulatory policies associated with it is a particular benefit to clients in evaluating permit conditions, planning for meeting future regulatory requirements, and navigating through the regulatory process.

Ms. Reese is a registered Professional Engineer.

Sands, Richard

Saylor, Stanley E.

Rep. Saylor is a member of the PA House of Representatives serving the 94th Legislative District in southern York County. First elected in 1992, Rep. Saylor is currently serving his eighth term in the House. Prior to his election to the State House, Rep. Saylor was Vice-President of Jesse S. Saylor Plastering, Inc., in Dallastown, and Chief Assessor for York County.

Rep. Saylor graduated from Dallastown Area High School. He attended the Indiana University of Pennsylvania.

Rep. Saylor is currently the Republican Chairman of the House Committee on Local Government. He also serves as Chair of the House Republican Energy Task Force.

He is Chairman of the York Area Metropolitan Planning Organization's Coordinating Committee and a member of the York County Transportation Coalition. He served several legislative terms as a member of both the House Transportation Committee and the House Appropriations Committee.

Schnitzler, Robert F.

Mr. Schnitzler is a graduate of The Pennsylvania State University with a Bachelor of Science in Environmental Resource Management. Currently, Mr. Schnitzler is employed with Pennsylvania-American Water Company as Production Manager for the Company's operations in Central and Southeast Pennsylvania. His responsibilities include directing the operations of 14 water and wastewater treatment plants and associated facilities, including responsibility for the preparation of capital and operations and maintenance plans. Mr. Schnitzler managed the design, construction and start-up of numerous facilities. Previously, he held positions related to distribution system maintenance and construction, water quality management, and plant operations. Mr. Schnitzler holds a Class A, E, 1-14 Pennsylvania Waterworks Operator Certification and has 24 years of experience in the water industry.

Shuffstall, Bill C.

Mr. Shuffstall is a graduate of Slippery Rock University. Currently, Mr. Shuffstall is employed with the Penn State Cooperative Extension as an Extension Educator. His responsibilities include providing statewide leadership for cooperative extension education programs dealing with critical infrastructure issues. He also facilitates community strategic visioning and strategic planning initiatives in communities across the commonwealth. Most of his work is focused on helping community leaders understand how the world around them has changed, develop a common vision for their community or organization and develop projects that will move their community toward that common vision.

Silcox, Nathan P.

Mr. Silcox is a graduate of Lock Haven University with a Bachelor of Arts in Political Science and from The Pennsylvania State University-Harrisburg with a Masters in Public Administration. Currently, Mr. Silcox serves as the Executive Director of the Senate Local Government Committee and as the Legislative Director to Senator Bob Regola (R-39). As Committee Director, he serves as the point-of-contact for the Senate Republican Caucus on municipal issues. The Committee has focused on providing local governments' procurement flexibility, reforming the Uniform Construction Code, and promoting multi-municipal planning. As Legislative Director, he has coordinated Senator Regola's priorities, which include enacting state spending limits, eliminating lame voting sessions, and authorizing regional booking centers.

Prior to this position, he served as Legislative Director for Senator Bob Robbins (R-50). He was successful in shepherding through the legislative process several initiatives, including the Truth in Music Advertising Act, the Uniform Athlete Agent Act, and strengthening the National Guard Educational Assistance Program. He started his career in state government as a member of Governor Tom Ridge's team in the Pennsylvania Department of Education. As a Legislative Specialist, he helped promote the Governor's education reform agenda and was responsible for monitoring the education-related activities of the Pennsylvania General Assembly. He also interned in the offices of U.S. Senator Arlen Specter, State Senate President Pro Tempore Robert Jubelirer, and the Republican State Committee of Pennsylvania.

Toms, Chris W.

Mr. Toms is a graduate of Virginia Tech with a Bachelor of Science in Agricultural Engineering, and from Auburn University with a Masters in Forestry. Currently, Mr. Toms is employed with C.S. Davidson, Inc. as a Department Manager. His responsibilities include managing a branch office engineering department and representing Adams County municipal clients including Townships, Boroughs, the County and Municipal Authorities. All of the municipal authorities that he represents are currently considered Phase IV and V facilities under the Chesapeake Bay Tributary Strategy.

Wong, Darlene R.

Ms. Wong is a graduate of University of California at Berkeley with a Bachelor of Arts in Psychology and of the Emory University School of Law where she received her Juris Doctor. Currently, Ms. Wong is employed with the Pennsylvania Office of Consumer Advocate as an Assistant Consumer Advocate. Her responsibilities include representing the interests of Pennsylvania consumers in matters concerning their regulated utility services.

Ms. Wong has participated in numerous cases before the Pennsylvania Public Utility Commission, Federal Energy Regulatory Commission, and state courts involving issues related to water, telecommunications, gas and electric utilities

Zeph, Paul

Mr. Zeph is a graduate of Rollins College (Florida) with a Bachelor of Arts, and the University of Michigan School of Natural Resources with a Master's of Science. He is currently the state coordinator for the Highlands Action Program, PA DEP Office of Water Management. His work includes conducting a statewide analysis of green infrastructure, and coordinating multi-agency efforts to protect high quality headwater areas and restore severely impaired watersheds in Pennsylvania's Appalachian region..

Zielinski, Paul A.

Mr. Zielinski is a graduate of the University of Pittsburgh with a Bachelor of Science in Chemistry. Currently, Mr. Zielinski is employed with Pennsylvania American Water as Senior Director of Water Quality and Environmental Compliance. His responsibilities include compliance with the Safe Drinking Water Act and the Clean Water Acts, using our residuals for beneficial reuse at an affordable cost, managing our State-wide Cross Connection/Backflow Prevention program, and enhancing our Environmental Stewardship with our stakeholders.

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IMWG Complete Concept Ideas

Note: Numbered ideas were generated by the IMWG and its members.

“PC” denotes a public comment suggestion. If a PC suggestion was similar to a work group numbered item, it was placed under the numbered item and indented.

If a PC suggestion was unique to the list, it was placed at the bottom of the appropriate category, and not indented.

1. Rates

- 1.1. Establish guidelines for reasonable water and wastewater charges based on family income or other measure and educate the public on their reasonableness and value. This would, for example, set a target-combined sewer and water rate of, say, 2.5% of median family income. Perhaps a sliding scale would be appropriate instead of one standard to address the communities that have excessively high or low median family incomes. Systems with rates below the target would not be eligible for financial assistance and systems with rates projected to be above the target would receive only the financing needed to achieve the target rate. User rates would be adjusted annually to continue to meet that target and any excess revenues resulting from rate increases to the adjusted target would be returned to the funding agency as an early repayment of the grant and/or the loan. This requires appropriate rate making standards be established.
- 1.2. Prohibit rates that are less than the true cost of business and force a capital reserve be budgeted in an amount required to allow replacement of infrastructure at the end of its projected useful life.
- 1.3. Recognize the benefit to society in general of community water and wastewater service and therefore establish a taxpayer based capital improvements grant program aimed at providing sufficient funding to meet the reasonable water and wastewater rates guidelines.
- 1.4. Establish ratemaking standards and procedures for all water and wastewater providers.
- 1.5. Since sustainability has a cost, require that low-income customer assistance programs be established to reduce the burden on the lowest income customers.
- 1.6. Encourage equalization as a method to reduce demand on existing infrastructure and create time of day rate structures as a means of encouraging equalization.
- 1.7. Establish rate structure based on actual gallons of water used

2. Standards and Training

- 2.1. Establish minimum standards for the management of all water and wastewater systems.

- 2.2. Award no grants or loans for systems not meeting management standards.
- 2.3. Require regionalization of systems in trouble or systems with rates projected to be above the target rates.
- 2.4. Establish statewide standards for developer built water and sewer systems for local systems to rely on.

3. Design

- 3.1. Force right sizing and limit support to systems that are too large. This would eliminate the 100 gallons/capita/day (GPCD) for sewer system and wastewater treatment plant design or 400 GPD/EDU for commercial EDU's in Act 537 Planning and would save both capital costs and would reduce operation and maintenance costs and is especially important in small systems.
- 3.2. Shorten planning periods by providing capacity for 10 years; not 20 years into the future.
- 3.3. Establish maximum I/I allowances. Provide no funding if I/I exceed a certain threshold.
- 3.4. Mandate pressure sewers in small sewer systems where I/I can be a significant portion of the flow. For example, an 8-inch pipe can carry over 1 MGD and one leak in a gravity system can contribute that amount of I/I. That flow would far exceed the capacity of a 100,000 GPD treatment plant. Pressure sewers have no I/I. A smaller WWTP would result.
- 3.5. Require pressure sewers (and water reuse) in all Special Protection watersheds.
- 3.6. Require water reuse in all new systems similar to several other states and address any liability issues related to water reuse so it will be encouraged and not burdened by the threat of lawsuit.
 - PC Implement alternative ways to safely handle grey water would free up capacity for black water treatment.
- 3.7. Establish design and construction standards for individual water supply wells.
- 3.8. Require the inspection and correction of deficiencies in lateral, building sewer, and water service lines at time of real estate transfer.
- 3.9. Require the installation of low use plumbing fixtures at the time of real estate transfer.
- 3.10. Encourage the selection of the right kind of system including decentralized systems where appropriate.
 - PC High energy plasma pulse technology
 - PC Designs that take advantage of gravity
 - PC Encourage more land application of bio-solids for planting of switch grasses as alternative energy source.

- PC One authority found it was not cost-effective to treat CSO's. They have a proposal to re-use the water by sending the water through limestone banks and back through mine pools. They have identified a private company wanting assistance to implement proposal.
- PC Milton is creating the first plant to be a net generator of electricity through anaerobic treatment of waste (food processing plant produces 60% of water treated) that generates biogas (methane) to power generator for electricity. Will use ½ of power generated, rest goes to the grid. The system will use waste heat to dry sludge up to 95% solids, an improvement from 20%, to be used as a fertilizer, soil amendment.

4. Regionalization/Planning/Coordination

- 4.1. Encourage the formation of county and watershed based water and wastewater infrastructure providers.
 - PC Provide incentives to create countywide authorities or co-operatives to manage water, wastewater, stormwater, or to define by stormwater watersheds. These co-operatives would be more financially viable, and could be more easily taken over if needed. Assess fees based on Equivalent Dwelling Units or special use tax based on fair impact with vouchers to address affordability. Create a voucher program based on economic goals for communities that can't afford appropriate fixed rate structures to insure sustainability.
- 4.2. Create a moratorium on any new independent systems including developer owner and homeowner association owned - henceforth all systems must be extensions or satellites of existing systems.
- 4.3. Create a definition of "affected municipality" to include all water and wastewater system providers within 10-miles of the municipality or within the watershed when completing Act 537 Planning.
- 4.4. Force watershed based and neighboring municipality Act 537 planning.
 - PC Integrate water resource management to better coordinate municipal efforts to protect water quality, recreation use, public health, economic development.
- 4.5. Require lowest present worth cost selection methods within Act 537.
- 4.6. Create comprehensive regional water management districts by watershed or by groups of watersheds (there are about 400 watersheds in PA, so grouping them makes sense).
 - PC It would be nice to have one regional entity to help prioritize all water supply and water quality projects.
 - PC In a survey in southwest Pennsylvania, 60% of the respondents believed they have water and sewer issues and are willing to pay if it will have an

impact on improvement, especially if they can see the results of their actions. The study recommended formation of a “water district” to provide regional planning services, assistance to local authorities with responsibility to provide water and sewer. District should have independent board with the function of integrated water resource planning, prioritization of regional water projects, coordination of funding, providing technical assistance, regional data collection and management. The district would not have the authority to compel, only facilitate and help plan. The district could be funded with budget of \$1.8-\$5.4 million per year (75 cents to \$2.00 per person per year). Benefits include ability to create efficiency of operation and maintenance, share equipment, and provide greater access to money with greater equity to work out problems.

- 4.7. Require the establishment of integrated regional water plans as a prerequisite to receiving grant or loan funding.
- 4.8. Coordinate work to make use of heavy machinery in place to do other work (ex: pipe improvements while roadwork is taking place).

5. Law/Regulation

- 5.1. Eliminate multi-prime laws.
- 5.2. Raise the bidding minima.
- 5.3. Establish rules and roles for water and wastewater infrastructure planning vs. municipal planning requirements. Address once and for all what comes first, the chicken or the sewer.
- 5.4. Mandate trading as a lower cost compliance solution everywhere it is viable.
 - PC Nutrient trading would be a more useful tool if it were more stable and less risky; consider adding a nutrient credit bank to reduce trading risks and enhance predictability and effectiveness for both producers and buyers of credits.
 - PC Expand the use of credits and the concept of trading to facilitate incorporation of non-structural alternatives (nonpoint source practices) rather than engineering construction into all projects, not just those in the Chesapeake Bay.
 - PC Alternatives to capital upgrades, such as nutrient credit trading, may be useful tools in some circumstances and situations, as long as it can be demonstrated that measurable water quality improvements will be achieved, but these should not be viewed as a panacea. Infrastructure (structural or non-structural) upgrades and innovative technologies will still be preferable in many situations and, in fact, will be necessary to generate future credits to trade. Consequently, establishing funding sources at all government levels to achieve these upgrades should remain a priority.

- 5.5. Where trading is allowed establish stipulated penalties for exceeding a cap as a funding method for compliance projects.
- 5.6. Require lowest use water fixtures and encourage water fixture trade-in programs.
- 5.7. Require developers to pay the full cost of the impact of their development on water and wastewater infrastructure.
- 5.8. Allow/encourage/mandate the joint purchasing of supplies, equipment, and services by groups of water and wastewater service providers.
- 5.9. Identify and remove roadblocks to the implementation of existing and new technologies.
 - PC Technologies and alternatives to improve water quality in lieu of infrastructure are being investigated on a daily basis. The problem is not finding concepts, but the State's regulation and policy structure impedes any real measure of their effectiveness, cost and benefits.
- 5.10. Require all new construction to meet low flow, water reuse, and green design standards plus a 10% retrofit requirement on existing housing.
- 5.11. Re-define mine and quarry water as groundwater.
- 5.12. Require regular maintenance of systems, rather than wait for system failure precipitating an emergency bailout appropriation.
- 5.13. Use wastewater to replenish groundwater. Will need a change in DEP requirement.
 - PC Establish mandatory installation of new innovative technology on all wastewater treatment systems.
 - PC Incentivize / require conservation.
 - PC Existing detention structures need to be monitored audited as to efficiency, maintenance.
 - PC Utilize/mandate efficiency audits
 - PC Place a moratorium on new development along the Susquehanna River.
 - PC Existing regulations need to be supported and enforced in order to enhance any planning efforts. Any progressive strategies cannot continue to be offset by waivers, variances, zoning accommodations, comprehensive plan inconsistencies, and other municipal approvals that undermine these ongoing infrastructure planning efforts. Furthermore, the MPC needs to coordinate water supply, waste water, and storm water in order to address these issues.

6. Building Sewers and Laterals and Water Services

- 6.1. Require private or public “insurance” on building sewers, laterals, and water service lines to allow rehabilitation of those lines.
- 6.2. Alternatively, require that the building sewer, laterals and water services be maintained by the collection or the distribution system provider.

7. Public Education

- 7.1. Initiate a statewide public education program. Link the needed upgrades to infrastructure to sustaining current quality of life.
- 7.2. Encourage student tours of water and wastewater systems.
- 7.3. Require water and wastewater education as part of the state approved curriculum for elementary, middle, and high school students.
- 7.4. Create educational liaisons with community colleges and universities to better educate the public and to help train our future water and wastewater professionals.
- 7.5. Consider how water reuse, conservation, and low impact development would impact the social order and create a public education program to address those impacts.
 - PC Promote water conservation. What is missing is the education to promote use of water conservation measures by customers and the incentives to participate in water conservation initiatives. Water conservation is only of interest during a drought; this needs to change.
 - PC Promote protection through innovative measures that recharge aquifer, promote re-use, conservation, education for environmental protection,
- 7.6. Provide public education for homeowners on lawn fertilizing and require the training and licensing of commercial lawn care service providers so that something similar to nutrient management plans are applied to lawns and lawn care.
- 7.7. Identify worldwide and USA best practices and apply them in Pennsylvania.
 - PC Look to other countries, other states for innovative examples of practices.
- PC Need education of engineers and technical staff on effectiveness of alternative solutions to building a treatment plant.

8. Finance

- 8.1. Create a significant private sector role for project finance.
- 8.2. Encourage private/public partnerships in all areas, especially the bail out of existing systems in trouble.
- PC Establish centralized fund for auditing of flooding structures, detention basins.

9. Stormwater Pollution

9.1. Encourage the formation of SW enterprise agencies within the water and wastewater community to integrate planning, services, and customer bases.

PC There are better practices for erosion control for sediment runoff reduction than silt fences, such as silt socks are excellent filters, especially if put behind fences.

10. Energy

10.1. Establish a 5-year moratorium on delivery of bio-solids to landfills in favor of generating waste to energy.

10.2. Establish a 5-year moratorium on aerobic bio-solids digestion and require anaerobic digestion with energy recovery.

PC Install micro-turbines, biogas technologies and windmills for energy efficiencies for small systems.

PC Consider treating Abandoned Mine Drainage (AMD) as a solution to meeting nitrogen and phosphorus reduction goals. Suggest passive AMD treatment systems as a cost-effective solution. Active systems are also a solution by cost more to operate and maintain.

11. Technology

PC Robotics industry has tools to help systems make informed decisions for asset identification and valuation, failure impact evaluation, risk management, condition assessment, rehab and replacement planning, capacity assessment, maintenance analysis and planning and financial management. With these tools, systems are able to break the system into components and collect digitized information for analysis and archiving. Systems can use robotics to collect information in the pipes to inspect their condition. Future uses include cleaning and maintenance and repair, rehabilitation, replacement. The goals are to: (1) Focus on asset management and condition prediction, (2) assist in base lining for true benchmarking and time based analysis, (3) develop new technology for cleaning and rehab challenges, (4) leverage innovations, export solutions worldwide and (5) support best and most cost effective decisions for PA.

12. Better Use of and Protection of “Green” Infrastructure

12.1. Provide statewide support for tree planting and for rain gardens.

PC Riparian buffers may be more effective than creating wetlands. Most developers don't want to lose the land. Look at pervious surfacing alternatives, rain barrels (can save 75 gallons per household that doesn't wind up in storm water.)

- PC Need “green” solutions that will help reduce duration and frequency of storm events in combination with “grey” solutions. “Green” solutions are those that minimize stormwater getting to sewer system like rain barrels, rain gardens, plantings along streets, porous pavement. “Grey” solutions are those linked to construction of infrastructure expansion and improvement. (Costs by ALCOSAN estimated at \$60 million now, \$10 million ten years ago)
- PC Green Vision Principles include promoting a balance between natural and built environment and promoting energy efficiency and water conservation through the rebuilding of urban infrastructure to produce safer community while reducing the demand for both water and energy. East Liberty cited as an example where the problem is a single sanitary sewer system that conveys both waste and stormwater. The goal is to minimize stormwater, rather than build bigger pipes by building simple structures between street and curbs, including vegetation in aisles between streets, in parking aisles, add plantings along pedestrian walkways; making portions of streets pervious along curbs and building reservoirs under the surface; using rain barrels, rain gardens at every house; and expanding parks. Through these measures they expect to eliminate the same amount of runoff generated from a 1-inch rainfall, thus eliminating combined sewer overflow discharges 95% of the time.
- 12.2. Use greenways to recycle and reuse water.
- 12.3 Better utilization of existing and creation of new wetlands to assist with retention, treatment and infiltration.
- 12.4 Require forested buffers on all streams.
- PC Need to restore riparian buffers in non-agricultural areas. Need trees to reduce sediments; shades the system to enhance nutrient removal processes. Put them everywhere where removed, such as urban areas.
- PC The width of the forest buffer is important due to the filtration processes. The more bottom surface area for filtration and pollutant assimilation for nitrogen and organic matter, the better. Stream systems can process between 25 and 75% of nitrogen added to the system.
- PC Protect existing forests. Rainfall interception from woodlands can range from 15 to 48% from the canopy; total woodland can increase interception to 76%. An analysis of the costs incurred through loss of woodlands incurred by downstream entities is needed. Downstream entities need to be involved in land use decisions upstream, need to develop market, local based economic data on impact of elimination of woodlands and control increased stormwater and flooding.
- PC Preserve more wetlands and floodplains.

PC Explore banking of land until infrastructure is in place to address development problems.

PC Non-structural solutions can include sustainable land use planning by municipalities and judicious implementation of existing statutes and ordinances to drive the location of infrastructure. Conscientious ground and surface water protection policies and strategies must be implemented in the very near future, or all water will require treatment. A sustainable approach to drinking water supply should not depend on the assumption that all water will require treatment. It is unwise to assume that treatment technology in the future will be able to correct and treat all water pollution.

PC The protection of pristine groundwater supplies is the most sustainable and cost-efficient approach to long-term potable water supply. This would involve protecting groundwater by purchasing land or limiting construction in groundwater recharge areas.

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Additional Commentary on Rates

Comments are based upon experience in the state's regulated utilities sector, and may be helpful in application or as a starting point for water and wastewater systems run by municipal authorities or municipalities. The Office of Consumer Advocate is aware that some municipalities, including the Philadelphia Water Department and Philadelphia Gas Works, also operate similar types of programs.

1.1 – Reasonable charges based upon family income or other measure

Income levels for most utility assistance programs are set at 135% of poverty. Currently, gas and electric utilities in Pennsylvania are required to have low income assistance programs. These include (1) LIHEAP (low Income Home Energy Assistance Program); (2) LIURP (Low Income Usage Reduction Program); (3) CAP (customer Assistance Program); (4) CARES (Customer Assistance Referral and Evaluation Program); (5) Hardship Funds (e.g., Dollar Energy); (6) Crisis Grants; (7) Weatherization Assistance Programs.

LIHEAP is a federal program assisting low-income customers, administered by Department of Public Welfare, although a customer need not be on welfare to qualify. Checks are mailed to the utility on the customer's behalf, or directly to the customer. Eligibility requirement is that income is no more than 135% of the federal poverty income guidelines.

LIURP can lower customer bills by helping customers reduce consumption. The utility may install energy saving devices in the home, including insulation.

CAP can lower monthly bills by a certain rate that is determined by household size and gross income, and ability to pay. Some CAP programs may be based upon a percentage of income, or a percentage rate discount. In exchange for regular payments, utilities may forgive some amounts from the balance owed.

CARES helps customers with special needs in finding ways to pay their bills. Special needs can include family emergencies, divorce, unemployment and medical emergencies.

Hardship Funds provide cash assistance grants to customers not qualifying for other assistance programs. Grants may be applied directly to the customer's account.

Weatherization Assistance Programs are offered to utilities to help make homes more energy efficient, reducing bills by reducing usage.

Such programs could be required of Pennsylvania's water and wastewater utilities. See topic 1.5 discussion, below. Similar types of programs are being used by some water and wastewater utilities (both public and private) around the United States.

1.2 – Prohibit rates that are less than true cost of business; force a capital reserve to be budgeted to meet infrastructure replacement needs

Currently, rates for state regulated utilities are comprised of both a customer charge to recover fixed costs of serving customers, and a consumption charge to recover costs based upon usage. Included in these rates are an allowance for profits to the utility's shareholders. While it is possible that the Public Utility Commission could have ordered rates at some time that would allow a utility to recover less than the true cost of business, such situation almost never occurs and thus is not a significant risk for any utility coming before the PUC requesting a rate increase. The more likely concern for regulated utilities, particularly smaller water and wastewater utilities is that the utility will not file for rate increases on a regular basis. Thus over time, rates can become out of alignment with the current cost of providing service.

For unregulated utilities, if this prohibition is put into place, there should be an adequate review process to determine the true cost of operating the business (which is one of the major issues in any rate case before the PUC). For example, if a municipal water department is also responsible for maintaining a public park, or for plowing snow during the winter, does that represent a cost of operating the water business? Similarly, if a water department's billing and customer service is provided by the municipality at no cost to the water department, should water rates be increased to recover that cost? Should a water department charge the municipality for providing public fire protection service, or is it reasonable to have the water utility pay that cost? Should a municipality allocate its electricity bill between the water department and other government operations when they share the same building?

Lastly, if a municipality that does not serve outside of its boundaries (i.e., a municipal utility that is not regulated by the Pennsylvania Public Utility Commission) chooses to recover certain costs through water and wastewater rates and other costs through taxes, does that affect any statewide interest?

Forcing small utilities to budget for a capital reserve might be reasonable, if the cost impact on customers is reasonable. Currently, a permit may be granted to an individual to establish a water or wastewater system without sufficient managerial or technical expertise or experience to maintain the system in good health for the many years to come. Legislation that imposes a financial framework may aid by helping such individuals make more sound management decisions where managerial discretion is exercised. The size of the capital reserve, however, must be reasonably related to the operations of the utility and the ability of its customers to support such an investment.

1.3 – Establish taxpayer based capital improvements grant program to provide sufficient funding to meet reasonable water and wastewater rate guidelines

One model for the design and administration of such a program could be the existing PENNVEST (Pennsylvania Infrastructure Investment Authority).

1.4 – Establish ratemaking standards and procedures for all water and wastewater providers

The ratemaking standards and procedures established by the Pennsylvania Public Utility Commission, and other state commissions, could be models to start from for municipal authorities and municipal owned utilities. Many of those same standards are reflected in the American Water Works Association's Manual M1 (*Principles of Water Rates, Fees, and Charges*) and the Water Environment Federation's Manual of Practice 27 (*Financing and Charges for Wastewater Systems*), which are used by most water and wastewater engineers and rate consultants.

Additionally, there could be a requirement or standard for asset management that includes more aggressive and pervasive monitoring of the system, so repairs may be made before costly replacements are needed.

1.5 – Require low income customer assistance programs to reduce burden on lowest income customers

Water and wastewater customers are having problems paying their current water and wastewater bills. With increased costs of infrastructure replacement on the horizon, it is important that these programs be required where they have not been put into place voluntarily. Even where such voluntarily implemented programs exist, without performance requirements, these programs can be ineffective. For example, in the case of one of Pennsylvania's two largest water utilities, its customer assistance program counted more defaults than number of total program participants for each of the past several years. It was not until the program was more closely examined, and criticized in its most recent rate case, that the company has been spurred to address the problem where the intended beneficiaries are not receiving the benefits.

1.6 – Encourage equalization

Rate equalization, if applied to municipal authorities and municipal owned utilities, would seem to apply in cases of regionalization with a neighboring water system. It could be tied to regionalization requirements such that when a water or wastewater system is acquired by another like utility, that customer rates in different systems should approach one uniform rate which can spread large costs relatively equally throughout the customer base.

1.7 – Establish rate structure based on actual gallons of water used

Many municipal owned water systems have rate designs that include a minimum allowance. For example, associated with a municipal utility's minimum monthly charge of \$25 per month might be a usage allowance of up to 4,000 gallons per month. Only after 4,000 gallons per month is used, would volumetric rates, or consumption related rates, be imposed for gallons used above 4,000 gallons per month. Such minimum charge and allowance could undermine conservation goals and the idea of rates based

upon actual cost of service, by promoting the idea that some water is free. The trend before the Pennsylvania PUC has been to redesign such rate structures where they currently exist, as the opportunity may arise with each rate case. Redesigning a minimum allowance would result in a customer charge to recover fixed costs of serving customers, and separate charges associated with levels of consumption.

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Additional Commentary on Regionalization/Planning/Coordination

Definition of Issue: Problem Statement

Regional Planning is the process of considering the impacts of development across a particular geographic area. The standard approach in Pennsylvania has traditionally focused the planning area within jurisdictional boundaries of individual municipalities of which Pennsylvania has a total of 2,566 municipalities. Water and its organizing structure “a watershed” is proposed to be the new geographic region in which municipalities will cooperate to plan for their future growth and development. A watershed approach broadens the geographic planning area beyond political boundaries and extends it to the hydrological boundaries of the watershed.

The merits of this approach and issues are outlined below. From a practical approach - water almost always crosses political boundaries. By planning at a watershed scale, local government leaders can take advantage of the many land use tools, in particular watershed-based zoning, that are beneficial in protecting the long term supply and quality of Pennsylvania’s water and management of its wastewater.

Background and Need

Currently, it is up to municipal governments to figure out how to integrate watershed strategies in their comprehensive plans and development regulations in order to protect local water resources and related infrastructure. The largely voluntary nature of planning in Pennsylvania guarantees that many of Pennsylvania’s communities are at risk to negative development impacts to their local water resources. Protecting and managing water resources at the broader watershed scale requires inter-municipal cooperation.

On the bright side, many land use planning tools, adopted jointly or individually, are at the disposal of local government officials who recognize the need to protect water resource lands and allow for growth and development. Examples include:

- Effective agricultural zoning
- Transfer of development rights
- Conservation easements on agricultural or forested land (purchased or donated)
- Overlay zones to protect wellhead protection areas, streamside buffers
- Green infrastructure planning
- Conservation subdivision or open space design
- Traditional neighborhood development
- Infill and redevelopment incentives
- Stormwater regulations that reduce impervious cover and infiltrate and/or treat stormwater runoff

Nearly 1,200 municipalities have adopted comprehensive plans to guide future land uses. And the number of municipalities engaged in cooperative, multi-municipal

planning (permitted under the MPC since 2000) is growing – 760 municipalities and counties were involved in 207 multi-municipal comprehensive plans in 2005.(1)

Short Term Recommendations

Legislatively allow or require a watershed-based planning unit that would cross over political boundaries. The watershed planning unit could be based on Pennsylvania's original State Water Plan that divided Pennsylvania into 104 watersheds or alternately, the planning unit could be based on the USGS cataloging units or "HUCs" (Hydrological Unit Code). The federal system consists of approximately 400 watershed planning units.

For this approach to be successful legislation may be required to revamp the MPC and property tax system to build incentives for the adoption of watershed based zoning. For example, incentives for a permanently protected, rural watershed protection zone might be no property taxes, no future public water or sewer lines, conservation easement protection, and sustainable economic activities that follow strict management guidelines.

Take a serious look at restructuring requirements for comprehensive planning and mandate that land use planning will be completed at a regional watershed based planning unit. Municipalities can maintain their individuality in the process but would be required to participate. Municipalities can retain their authority and control over such responsibilities as road maintenance and fire protection, but land use planning is better done at a larger scale and requires expertise and resources that are not routinely found in every one of Pennsylvania's 2,566 municipalities.

Reorganize DEP along major watersheds (Ohio, Susquehanna, Delaware, etc.)

Add PennVEST bonus points for forming authorities across municipal boundaries to manage water and waste water along watershed lines.

Direct DEP to reinvigorate the watershed approach by increasing its focus on watersheds.

Update all grants programs to reflect a watershed approach and encourage cross program grant funding to address issues on watersheds, not just issue area.

Additional Commentary on Law/Regulation

A. Cost Effectiveness of Nutrient Trading

The World Resources Institute (WRI) examined several policy instruments to address pollution in the Gulf of Mexico and their effect on the environment and farm income: (1) regulation; (2) taxes and subsidies; (3) nutrient trading; and (4) reverse auctions. Nutrient trading was deemed most cost-effective in terms of resulting in the largest decreases in nitrogen reaching the Gulf of Mexico, hand in hand with the greatest improvements to farm income.³

WRI also examined effects of policy options on phosphorous impaired waters in Wisconsin, Michigan and Minnesota. It examined: (1) tightening point source regulatory requirements; (2) subsidies for nutrient management; (3) performance requirements with trading; and (4) performance-based conservation subsidies with trading. A program of trading along with performance-based conservation subsidies was found to be the least-cost option. WRI noted that “giving point sources the flexibility to meet their performance requirements by either upgrading their facilities or by trading with other point sources or non-point sources considerably lowers the cost of meeting regulatory requirements.”⁴

In Pennsylvania, however, few trades are taking place under a non-mandatory Nutrient Credit Trading Program that the Pennsylvania Department of Environmental Protection (“DEP” or “the Department”) developed to meet water quality requirements for the Chesapeake Bay.⁵ The Department’s strategy has been to impose new, stricter discharge limits on point sources (including sewage treatment plants and new residential development), while addressing non-point source pollution (primarily agricultural runoff) through a combination of voluntary measures, educational initiatives, and financial incentives for participation. To date, the Department’s nutrient credit trading program has been received with skepticism by many stakeholders. Currently, the vast majority of the 63 largest sewage treatment plants in Pennsylvania’s portion of the Bay watershed plan to meet their nutrient limits through capital upgrades. The supply of credits for trading is limited, as farmers and others have lacked willingness to invest in agricultural best management practices (BMPs) that would generate credits.⁶

³Dr. Suzie Greenhalgh and Mindy Selman, World Resources Institute, OECD Workshop on Agriculture and Water: Sustainability, Markets and Policies at 6 (Nov. 14-18, 2005) (WRI Report). WRI also found nutrient trading resulted in improved local water quality and reductions in greenhouse gas emissions and soil losses.

⁴ WRI Report at 7.

⁵ Under the DEP’s program, sewage treatment plants and developers that are required to reduce their pollution discharges to the Chesapeake Bay would be able to buy nutrient reduction “credits” – defined as a pound of reduction of nitrogen or phosphorous – to meet their nutrient discharge limits.

⁶ The supply of credits is measured as pounds of nitrogen or phosphorus reduction above and beyond baseline reduction requirements and meeting a given “threshold.”

One solution to Pennsylvania's problem is establishing a nutrient credit trading "bank." A bank that aggregates or bundles credits, including those from non-regulated sources, could help stimulate a trading market and provide long-term stability and predictability for generators and users of credits alike. A bank could also invest in agricultural BMPs to aid the generation of future credits. Another solution may be to mandate some level of participation in the trading program.^{7, 8} Penalties for exceeding caps could fund compliance projects or low income customer assistance, along with incentivizing innovation and compliance.⁹ Finally, a mechanism that allows non-point sources and utility customers to participate by creating and selling credits for their nutrient reduction practices could also support a more viable nutrient reduction program.

B. Cost Effectiveness of Green Building Standards Applied to Fixtures, New Buildings, and Existing Utility Facilities

Conservation is a key to reducing costs to ratepayers who ultimately shoulder the burden of necessary facility replacements, improvements, additions and extensions. Green building standards that support conservation can be cost-effective where conservation reduces or delays the need to expand potable water facilities. They also can have a direct impact on customer bills that are tied to volume of use (compared to customer bills based upon a flat or fixed charge).

The Energy Policy Act of 1992 (Public Law 102-486) required all new toilets for the home to use 1.6 gallons per flush or less and all new showerheads and faucets to use 2.5 gallons per minute or less. Both of these requirements have been found to be very effective in reducing household water consumption without seriously affecting the way in which people use water. For example, in San Pablo, California a toilet replacement program reduced water consumption by approximately 77 gallons per day per household, a savings of 34%. Similarly, a showerhead replacement program in Seattle, Washington, resulted in an average decrease in indoor water consumption of 6.4%.¹⁰

⁷ Requiring pollution reduction as part of a watershed's specific nutrient budget, while also providing trading incentives and long-term stability of a nutrient credit trading bank, may encourage BMP technologies to be implemented in support of a more viable nutrient trading program in Pennsylvania. There may be a few exceptions. For instance, it may be undesirable to encourage a small system, discharging to a small stream with the highest treatment requirements, to buy credits that would allow further degradation to the small stream. In such a case, it may more desirable for a long interceptor to take a small wastewater treatment plant off the small stream and instead discharge to a larger body of water with a lower treatment requirement.

⁸ The Department of Environmental Protection has stated that the trading program to meet Chesapeake Bay requirements is voluntary.

⁹ Currently, treatment plants have enforceable permits. Builders must have NPDES permits and have a "zero discharge" requirement for new development under the Chesapeake Bay Tributary Strategy.

¹⁰ U.S. Environmental Protection Agency, *How to Conserve Water and Use It Effectively* (visited July 15, 2008) <<http://www.epa.gov/nps/chap2.html>>.

Water and wastewater utilities can also be held to a specific unaccounted for water standard. While a threshold of 20% unaccounted for water has been deemed excessive by the Pennsylvania Public Utility Commission, there is no specific requirement that a utility with an excessive unaccounted for water problem take any specific action to fix the problem.¹¹ Moreover, the American Water Works Association (AWWA) is recommending that utilities move away from the concept of “unaccounted for” water and adopt procedures to account for every drop of water that enters the utility system. Rather than the generalized concept of “unaccounted for water,” a single universal standard of accounting for all water withdrawn and consumed would enable a comparison of efficiencies across different utilities. Such comparison would help direct utility investment, grants, and other available funds by establishing a measure for prioritizing systems with the greatest need of improvement. Water utilities should be encouraged to adopt this water audit process that was developed by the International Water Association and the AWWA, and first used in this country by the Philadelphia Water Department.¹²

Currently, there is no specific, enforceable, standardized requirement for Pennsylvania’s regulated water or wastewater utilities that reflect a determination of what are the necessary components of an effective leak detection program. Nor is there any specific requirement that a utility have a leak detection program in place, at all. Early leak detection may avoid a later problem of a corroded and weakened main, susceptible to main breaks, especially with regard to older cast-iron infrastructure. High levels of unaccounted for water should be avoided. Excessive levels not only undermine conservation of resources, but also unnecessarily increase costs, due to the treatment, production, and distribution of the unaccounted for water. Requiring standards of leak detection as minimum requirements to achieve more cost effective utility operations could increase efficiencies, help conservation efforts, and reduce unnecessary costs.

Regarding new building standards, allowing for an array, rather than a single set of green building standards could promote energy conservation in a cost-effective manner by promoting competition among eligible standards.¹³

¹¹ See 52 Pa. Code § 65.20(4).

¹² American Water Works Association, *Water Audit Methodology* (visited July 29, 2008) <<http://www.awwa.org/Resources/Content.cfm?ItemNumber=588>>. See also Thornton, et al., *Water Loss Control* (McGraw Hill 2008).

¹³ For example, Special Session House Bill 1, the Alternative Energy Investment Act, signed by Gov. Ed Rendell in July 2008, provides broad criteria for determining the eligibility of “high-performance” buildings that would allow multiple green building standards to qualify for \$25 million in grants for small business and residential owners for use in constructing those buildings. One such standard is the National Association of Home Builders’ (NAHB) National Green Building Standard, which is expected to be approved by the American National Standards Institute (ANSI) this year. The NAHB standards are based on the International Residential Code, which is the basis for Pennsylvania’s Uniform Construction Code.

Also, tying incentives, such as low-interest financing, to certain requirements could reduce green building costs while reducing the need for costly expansion of water and wastewater distribution mains.¹⁴

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¹⁴ For example, low-interest financing could apply to projects that build up, rather than build out. Reducing the need for expansive infrastructure can reduce a utility's costs of serving customers. The majority of the costs of conventional water resource infrastructure is in the underground pipes. See Testimony of Valerie I. Nelson, PhD, Coalition for Alternative Wastewater Treatment to Commission on Transportation and Infrastructure Subcommittee on Water Resources and Environment, US House of Representatives (June 14, 2005).

Comments on Concepts by Work Group Members

Grant Gulibon's Comments

Design and Technology

- Require the study and implementation of water reuse for all new development including all special protection watersheds.

Comment: New development in areas with special protection waters is already subject to strict environmental regulation. There is a concern that additional regulatory requirements will have a negative effect on housing affordability and choice for consumers in affected portions of Pennsylvania.

- Establish design and construction standards for individual water supply wells

Comment: The International Plumbing Code, which informs Pennsylvania's Uniform Construction Code, contains standards of the type advocated in this recommendation. Therefore, it is not clear that a need exists for additional standards in this area.

- Regarding infiltration and inflow (I/I):
 - Mandate the use of low pressure sewers for new sewer construction in special protection watersheds as a means to limit the volume of wastewater treated.

Comment: New development in areas with special protection waters is already subject to strict environmental regulation. There is a concern that additional regulatory requirements will have a negative effect on housing affordability and choice for consumers in affected portions of Pennsylvania.

Laws and Regulation

- Undertake a comprehensive review of the Chesapeake Bay Nutrient Credit Trading program to determine its effectiveness and any improvements that might be implemented. Specific questions to be answered are:
 - Establishing a cap price for credits and a stipulated penalty if credits are not purchased. Providing a cap on future credit prices enhances the desirability of trading. The innovation of the concept leads to uncertainty of future price and availability of credits which reduce the trading desirability.

Comment: The Department of Environmental Protection has repeatedly stated that it will not mandate use of the trading program or the acceptance of nutrient credits. Also, who would be penalized and how?

- Should trading be made mandatory if it results in a lower cost of compliance?

Comment: Under the Department of Environmental Protection's nutrient credit trading program policy, credits are good for only one year, although the practices that generate them can be long-term in nature.

Public Education

- Provide funding to evaluate how measures such as water reuse, conservation, and low-impact development will impact the social order.

Comment: The Department of Environmental Protection is already promoting a number of low-impact development techniques through its Stormwater BMP Manual (some of which are problematic in certain portions of Pennsylvania due to issues with the quality and composition of the soils present in those areas).

Stormwater Pollution and Better Use of and Protection of "Green" Infrastructure

- Begin the development of water quality standards for stormwater discharges, particularly the first flush and encourage the construction of wetlands to capture and treat the first flush through state financial assistance to several demonstration projects located throughout Pennsylvania.

Comment: Developing water quality standards for stormwater discharges raises a number of serious concerns. The Virginia Soil and Water Conservation Board recently declined to write specific pollution limits into stormwater permitting, stating that no other state has taken such a step. If this were to occur, homeowners and businesses would see large utility rate increases. The possibility also exists that in order to "retrofit" existing development in order to better manage stormwater runoff; fees may be assessed on new development and used for this purpose. Finally, the development of new wetlands holds the potential to restrict development in affected areas, as activities affecting wetlands already present costly, complex challenges to project applicants.

- State should invest funding in tree planting, construction of rain barrels, and rain gardens. Provide workshops on these topics. Work with Soil Conservation Districts, Penn State Extension Office, local colleges and universities, PA Department of Education, and local garden clubs to host workshops and provide education.

Comment: The Department of Environmental Protection is already promoting a number of low-impact development techniques through its Stormwater BMP Manual (some of which are problematic in certain portions of Pennsylvania due to issues with the quality and composition of the soils present in those areas).

- Encourage the formation of “Storm water Enterprise Agencies” within the water and wastewater community to integrate planning and services. These should be regional in approach and work with county planning commissions and local townships to offer model ordinance language, technical assistance, funding assistance, and models of non-structural storm water management.

Comment: Under the topic of “Stormwater Management,” the Legislative and Regulatory Needs Work Group draft report has to date recommended the following: “Encourage the voluntary integration of planning within the water, wastewater and stormwater communities,” without reference to the creation of stormwater enterprise agencies. Concerns exist that the creation of additional bodies with regulatory authority will add further complexity, cost and delay to the approval process for new development.

Issues

Regional solutions are not encouraged and as a result, Pennsylvania has too many small water and wastewater systems, some of which may need to be taken over by larger systems.

Comment: It should be pointed out that Senate Bills 2 and 1341, signed in July 2008 by Gov. Ed Rendell and which provide a combined \$1.2 billion in funding for water, sewer, stormwater, flood control and high hazard dam projects in Pennsylvania, do provide incentives for regional solutions to a number of infrastructure issues. The existing Pennsylvania Municipalities Planning Code (MPC) also provides for mechanisms and incentives for multi-municipal planning.

Darlene Wong’s Comments

Rates

- Require all non-PUC regulated water and sewer service providers who receive state grants or loans to establish a utility assistance program whereby low income customers would receive assistance in the case of low income or short term hardship to allow those customers to pay their water and sewer bills.

Comment: PUC regulated water and sewer providers could also be required to establish a customer assistance program, under legislation, where the PUC has declined so far to issue any such regulation. There are legislative models in place, the General Assembly having requirements for universal service and energy conservations policies for the regulated gas and electric industries. See 66 Pa. C.S. §§ 2203(8), 2804(9). These provisions require the PUC to ensure the programs are adequately funded.

- Develop appropriate legislation and/or regulation to establish detailed procedures for rate making standards and for calculating the true cost of business and to require that all non-PUC regulated water and sewer service providers establish

such rates within 5 years. Consideration should be given to incorporating the following two issues:

- Reflect in the rate structure measures to encourage equalization of wastewater discharge and water demand as a method to reduce demand on existing infrastructure.

Comment: Time of day rate structures are used in the energy industry, but I am doubtful that they will apply to make utility service more cost effective or affordable for most residential customers. While people can be flexible about when to run their air conditioner, for example, most water will likely be used (at least by residential customers) during peak periods (morning, early evening) for bathing, washing and cooking, the times which likely will not move into off-peak hours. If this idea remains, I would suggest stating with a caveat, rather than a mandate.

Issues

Public Education

Through DEP, develop handout/mailings tailored to the:

- General Public
 - Need for continued investment in infrastructure through rates
 - Water is one resource, reusable, conservable and limited
 - Conservation reduces costs to all users – provide examples and guidance
 - Reduce fertilizer use/loss through proper application.

Comment: Note that the Law and Regulation Subgroup proposes in its Appendix that a mechanism be established to allow utility customers to benefit from a trading program, so that they may aggregate credits that they may generate, and sell the credits.

Jodi Reese's Comments

Mandate the use of low pressure sewers for new sewer construction in special protection watersheds as a means to limit the volume of wastewater treated.

Comment: I feel strongly that it should be considered and implemented if cost effective and not mandated. Energy consumption and carbon footprint is higher. Current materials, construction techniques and testing requirements can result in very low I/I and still protect special protection watersheds. Mandating means that one size fits all which is rarely the case.

Similar to limits imposed for water loss in water distribution systems, establish maximum I/I allowance thresholds and if system exceeds threshold, limit funding to the portion of a project which is below the threshold.

Comment: Does this apply to funding for sewer projects only? How does one determine how much of a WWTP upgrade is for the part of the system with I/I that exceeds the threshold.

Employ private contractors to evaluate the technical and design aspects of each project for which state or federal grant and loan monies are sought to assure that the most cost effective solution has been selected.

Comment: Is this for each and every project, or should there be a cost threshold, above which this evaluation is required. And "cost effective solution" will be difficult to define.

Paul Zeph's Comments

Stormwater Pollution and Better Use of and Protection of "Green" Infrastructure

- Require statewide public education programs highlighting the concept that the watershed and water quality start at the catch basin, similar to the "Bay starts here."

Comment: DEP should be encouraged to specifically work with DCNR and other agencies to identify and protect natural areas that provide (or could provide) a valuable role in stormwater retention, ground water recharge, or sewage/septic treatment. Multiple-use facilities that allow infiltration, such as grassed playing fields, should be given priority over hardscape features.

- Begin the development of water quality standards for stormwater discharges, particularly the first flush and encourage the construction of wetlands to capture and treat the first flush through state financial assistance to several demonstration projects located throughout Pennsylvania.

Comment: DEP and county conservation districts should put a priority on wetland protection, particularly vernal pools, through enforcement and construction permit reviews. A regulation or policy change should require that delineation be done March - June as many of the intermittent wetlands are dry in late summer to fall when delineations are often done.

Sally Holbert's Comments