



The Water Report™

Water Rights, Water Quality & Water Solutions in the West

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& More!

USE ATTAINABILITY ANALYSIS

FRIEND OR FOE?

by John Spencer, Vice President, CH2M HILL Northwest Region (Bellevue, WA)
& Tom Dupuis, Senior Scientist & Program Manager, CH2M HILL NW Region (Boise, ID)

Introduction

Passage of the federal Clean Water Act (CWA) in 1972—with its goal of achieving water which is “...fishable and swimmable wherever attainable...”—set the United States on a renewed course to clean up our waterways. The CWA fundamentally changed the nation’s water quality programs. It shifted the focus away from a regulatory scheme where assimilative capacity studies were frequently used to determine pollutant loading. Instead, the CWA emphasized setting discharge limits relying on a technology-based approach. Secondary treatment for municipal dischargers, as well as “Best Practical Treatment” or “Best Available Treatment” (BPT/BAT) for industry, became requirements. This renewed approach leveled the playing field nationally, helped eliminate pollution havens, greatly reduced the time and cost of litigating assimilative capacity studies and loadings from various sources, and heralded a serious cleanup of waterbodies across the nation.

Recognizing that some waters would not achieve water quality standards even with secondary treatment and BPT, section 303 of the CWA required states to identify “impaired” waters and to prepare Total Maximum Daily Loads (TMDLs) for pollutants of concern to these waters. In essence, the assimilative capacity concept was retained for impaired waters where technology-based limits were not achieving water quality standards.

Water quality standards form the underlying basis by which a waterbody is defined as impaired and total maximum daily loading rates are determined. Setting water quality standards involves determining both the “designated uses” and the criteria (numeric or narrative, chemical and physical) that are intended to protect those uses. An example of a designated use would be “cold water aquatic life” and a hypothetical example of a criterion to protect that use would be a temperature of no greater than 20 degrees Celsius. (Sometimes the word “standard” is used to describe a criterion, but in this article we will use criterion to avoid confusion with the broader definition of standards.)

It is these water quality standards that bring Use Attainability Analysis into the forefront of consideration.

Use Attainability Analysis

Use Attainability Analysis (UAA) is a tool to make sure that the designated uses for a waterbody are the right uses. UAA may address either existing uses or attainable uses. Water quality standards also include mixing zone and antidegradation policies, but these aspects of the standards do not usually come into play in the UAA process.

UAA

Unfeasibility Factors

Considerations

Designated Uses

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UAA IS DEFINED AS:

“...a structured scientific assessment of the factors affecting the attainment of a use which may include physical, chemical, biological, and economic factors.”

There are six factors that may trigger a Use Attainability Analysis. A state may remove a designated use if it can show that the designated use is not feasible due to any one of these factors.

UNFEASIBILITY FACTORS INCLUDE:

1. Naturally occurring pollutant concentrations prevent the attainment of the use; or
2. Natural, ephemeral, intermittent, or low flow conditions, or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of discharges without violating state water conservation requirements to enable uses to be met; or
3. Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or
4. Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the waterbody to its original condition or to operate such modification in a way that would result in the attainment of the use; or
5. Physical conditions related to the natural features of the waterbody, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or
6. Controls more stringent than those required by section 301 (b) and 306 of the Act would result in substantial and widespread economic and social impact.

(40 CFR 131.10(g) Factors)

A UAA is also required when replacing a designated use with another use or subcategory of use that has less stringent criteria (e.g., changing from a cold water to warm water aquatic life use). This is more commonly the purpose of a UAA than simply removing a use.

Conducting a UAA for one or more of these factors does not result in an automatic conclusion that a designated use may or should be removed or changed as the basis for setting a water quality standard. There are many considerations that need to be made in designating uses for a waterbody and setting standards. Considerations include, but are not limited to: watershed habitat; upstream and downstream uses; and community interests. A UAA should not only address the specific factor(s) at issue, but also take into account the broader considerations for designating uses and setting protective criteria.

A UAA establishes the scientific basis upon which the *right* water quality standard is established for a waterbody. If a designated use was used to set a water quality standard and that designated use is neither existing or attainable then it is possible to have the designated use removed. An “existing use” is defined as a use that is or has existed in the waterbody any time since November 28, 1975, whether currently present or not. An “attainable use” is a use that would be expected to be present if, at a minimum, point source technology-based controls had been in place and nonpoint sources had applied cost-effective and reasonable BMPs.

Once designated uses are affirmed, either through water quality tri-annual reviews or through a UAA, the right water quality criteria may be defined for the specific waterbody in question. This may or may not result in a change to existing criteria applicable to a waterbody.

Most states hurriedly adopted designated uses in the late 1970s to be eligible for federal grant programs under the CWA. Although they recognized that designations were imperfect or based on limited data, they had the expectation that later refinements could be readily made where appropriate. However, EPA water quality standards regulations have made such refinements more difficult to accomplish when they entail removing a use or adopting one with less stringent criteria (e.g., the need to satisfy one of six factors listed earlier). For this reason among others, many states have waters that have not been subject to rigorous review or reevaluation of use designations for the purpose of setting water quality criteria. In these cases, states simply retain old designations or use a default provision in water quality standards by which the undesignated waterbody must meet default use criteria. Where these same waterbodies are designated impaired and subject to a TMDL study, a UAA may be necessary for setting appropriate water quality targets rather than using default criteria.

States define uses using various approaches, including class-based systems and use-based systems. In class-based systems, each class has a specific set of designated uses to be protected and specific water quality criteria designed to protect all uses within the class. An example would be Class AA for extraordinary waters, Class A for excellent waters, Class B for good waters, and Class C for fair waters. The disadvantages of class-based systems include: 1) aquatic life and recreational uses are linked (e.g., primary

UAA Use-Based Systems Default Criteria Collaborative Opportunity Revision Factors Standards Applicability Complexities Precedent Lacking	contact is presumed for excellent waters whereas secondary contact is presumed for fair waters); and 2) there is no flexibility to decide that certain uses within a class may be inappropriate for a particular waterbody. Some states recognize that it is more appropriate to rely on use-based systems that assign uses to waterbodies, rather than classes. Use-based systems assign designated uses to waterbodies independently of each other, instead of assigning waters to classes having predetermined sets of uses (regardless of what the waterbody can actually support). If a waterbody is undesignated and there is no default provision applicable to that waterbody and the general provision of “fishable and swimmable” is used, then the state is not required to conduct a UAA. The “fishable and swimmable” goal of the CWA overrides the need for a UAA. UAAs: Increased Attention The use of UAAs is receiving more attention for a number of reasons. Clearly, the nation-wide efforts to designate impaired waters and prepare TMDLs has greatly increased consideration of use designations and/or water quality default provisions. When the default criteria are used as the target for setting waste load allocations in TMDL studies, serious questions are raised about the target and the associated designed uses. In these cases, the opportunity to define water quality criteria for existing and attainable uses through a UAA can become compelling given the social, economic and environmental cost of attaining criteria that may have no relevancy for the specific waterbody. For many such waterbodies, the application of default provisions to set use-based criteria has focused the attention of numerous stakeholders and resulted in those standards being challenged—in some cases as inadequate and in others as not relevant. While the change from class-based water quality standards to use-based water quality standards has been a welcome improvement in water quality standards setting, it is also a challenge. That challenge creates an opportunity for states and stakeholder groups to use the UAA process as a means of collaboratively establishing use-based criteria for individual waterbodies. In the handbook “<i>Exploring Use Attainability Analysis</i>” (National Association of Clean Water Agencies and the Water Environment Research Foundation, 2005) (NACWA/WERF UAA Handbook) it is noted that revisions to state water quality standards have drawn increased attention for many “converging” factors. THESE CONVERGING FACTORS INCLUDE: 1) The Clean Water Act now emphasizes water-quality based permit limits rather than the technology-based limits 2) Focus on water quality controls has shifted from traditional point source dischargers (i.e., industrial and municipal wastewater treatment facilities) to wet weather point sources and nonpoint sources, especially Stormwater, CSOs, and agricultural runoff 3) TMDLs are required to develop load allocations (for nonpoint sources) and waste load allocations (for point sources), typically using existing water quality standards as the basis 4) States are to provide section 401 certification 5) Public reaction to biannual water quality assessments that consistently show that a large number of waterbodies do not meet water quality standards 6) To protect downstream uses 7) States are obligated to review water quality standards at least once every 3 years In its recent denial of the State of Washington Water Quality Standards, EPA noted that the UAA process is one of several available methods for the state to define more precisely the uses and criteria applicable to its waterbodies. Steps to Doing a UAA Conducting a UAA is not for the timid. Although some UAA processes are fairly simple (e.g., Kansas recreational UAAs for small streams), more commonly UAAs by their very nature tend to be rigorous, comprehensive and transparent in a robust public process. While the steps in conducting a UAA are fairly straight forward, the intersection between the science that describes an ecosystem and public understanding of water quality standards (social, economic and environmental) creates a very complex process of communicating and reaching legally defensible and publicly supportable water quality standards. Since many of the concepts and criteria for preparing UAA are untested and/or undefined, a UAA will be plowing new ground without formal guidelines or precedent to follow. Many of the concepts have not been applied in site specific or real world situations. Terms like “not feasible, or “cannot be remedied” are difficult to define and will be difficult to agree upon.
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UAA

The steps in conducting an UAA follow a logical sequence as outlined in Figure 2 from the NACWA/WERF UAA Handbook.

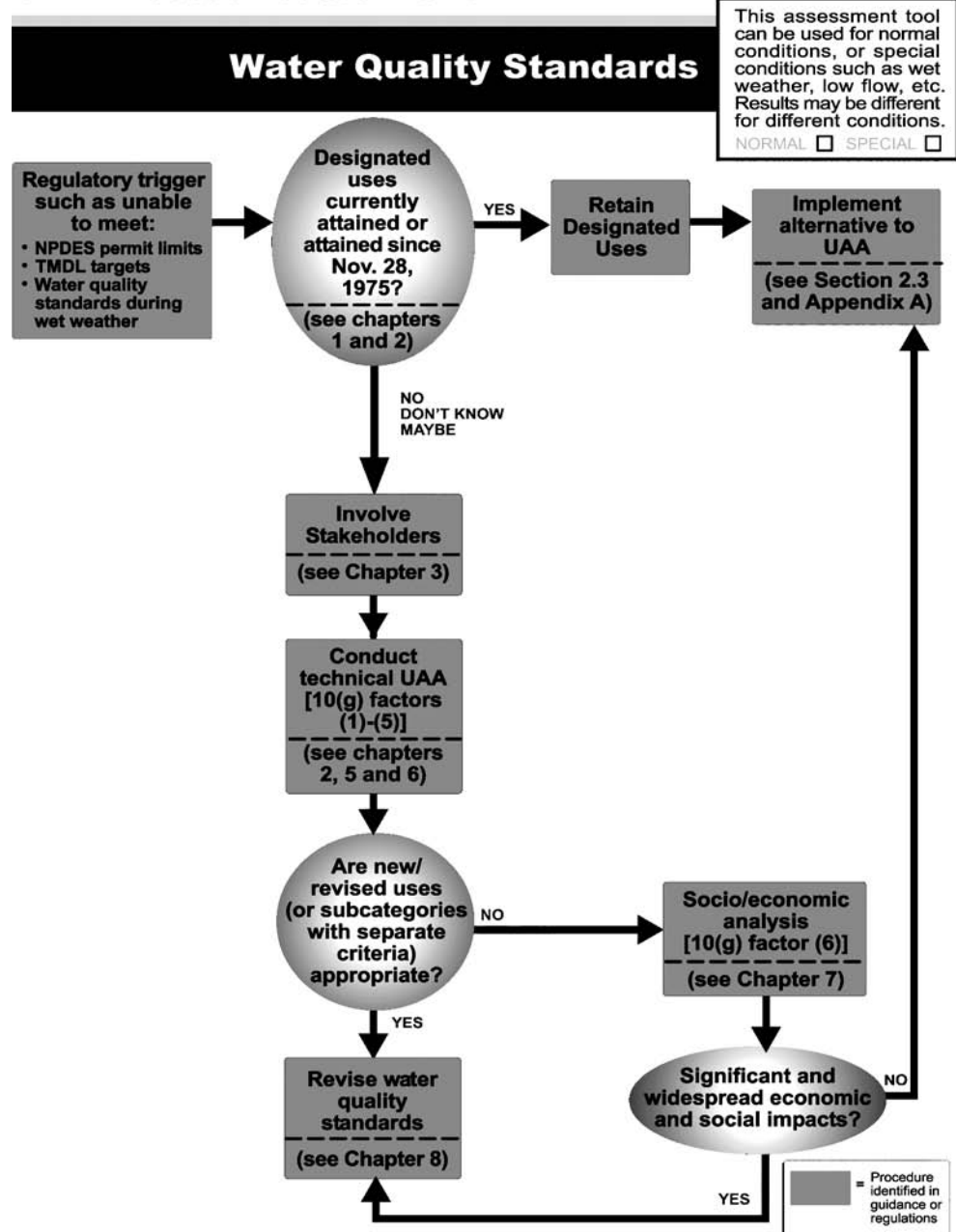
While the logical steps and science involved in doing a UAA can be defined as in the Figure below, there are also a number of preliminary steps advisable before defining the full scope of a UAA.

Figure 2

UAA Process Assessment

When?

Advisable Steps



Regulatory Consultation

It is very important to consult with the regulatory community and establish a collaborative process for conducting a UAA. The regulatory community is often adverse to conducting and/or approving UAAs. Regulators may view a UAA as a means of removing a use and lowering standards rather than as a means of defining the appropriate designated use and setting achievable standards to protect existing and attainable uses. However, there is growing evidence that this perception is changing and that UAAs are being seen as a means of setting appropriate standards for particular waterbodies.

It is likewise advisable to define the water quality problem and understand the alternatives available to resolve the problem before making a decision to conduct a UAA. Other alternatives may be more effective in bringing about resolution of a water quality problem than moving forward with a UAA.

UAA

Alternatives
to UAACompelling
ScienceCommunity
Support

While this paper does not address these alternatives, there are a number which should be considered.

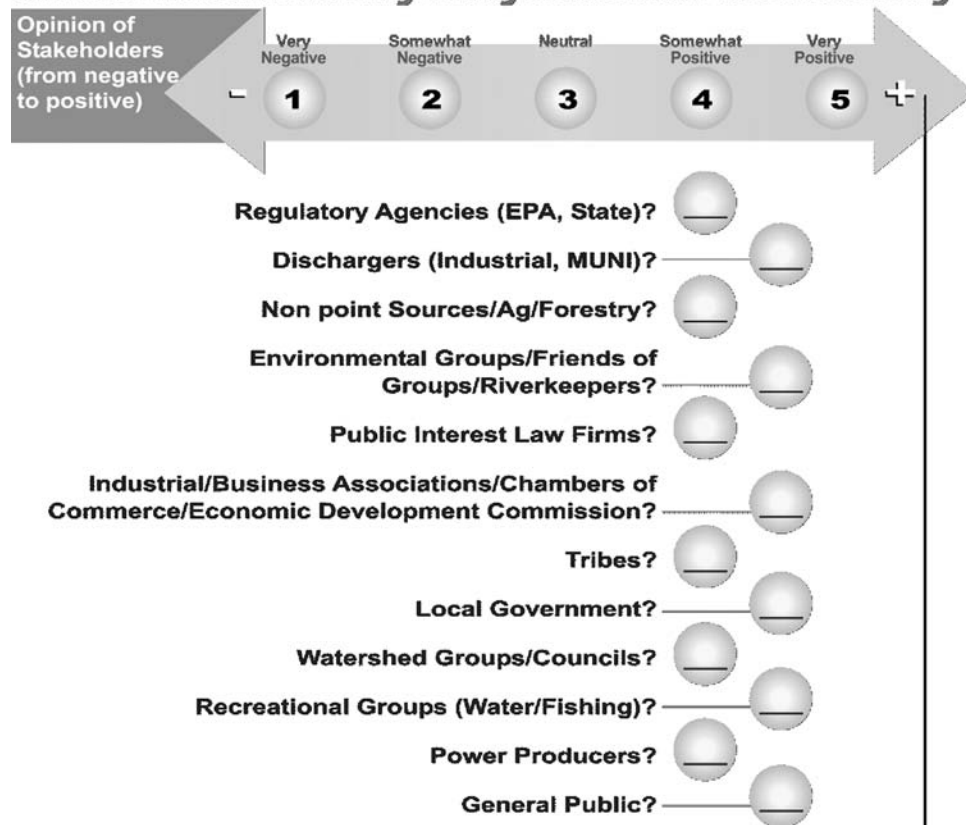
UAA ALTERNATIVES INCLUDE:

- Setting Site-specific Criteria
- Using translators to interpret criteria for specific waterbodies
- Develop Adaptive Management Plans to achieve water quality standards and track improvements
- Use Variances to deal with specific or individual regulatory issues due to economic hardship
- Use the Natural Background Clauses of water quality standards to address minor or de minimus issues
- Use Water Quality Credit Trading and Offsets within a watershed to achieve standards and optimize the reduction in pollutant loads
- Change the Point of Compliance
- Use Mixing Zones
- Revise Instream Low Flow Assumptions where appropriate in setting loading rates

UAAs must present a compelling scientific case for removing a designated use and have community support to be successful. Having a good understanding of the level of effort/degree of difficulty to prepare a UAA is absolutely necessary to sustain the effort to a successful conclusion.

A community readiness assessment is illustrated below in the NACWA/WERF UAA Handbook's Figure 4. This assessment is highly desirable to define an outreach strategy and communications process. Stakeholders and community groups may not be well informed of water quality laws or the complicated rationale and logic for setting water quality standards. Gaining the understanding of a broad base of the community is a major challenge of any UAA process. The community readiness assessment outlined in the Figure can assist in shaping a collaborative process and an effective communication program.

Figure 4

Community Readiness Assessment**UAA Self-Assessment: Diagnosing Stakeholder Understanding**

If involved stakeholders are negative to neutral, it is critical that learning events be initiated to build trust and understanding. If positive, education and outreach can be more focused on the technical aspects of the UAA. All stakeholders' knowledge and interests should be considered.

UAA

Appropriate Standards

Future UAA Role

Key Points

Public Acceptance

Under-used Tool

The Future

Congress set a goal to restore the nation's waters to a fishable and swimmable condition wherever attainable and has not wavered from that fundamental goal over 34 years. It is an achievable goal when the resources, talents and focus of a community can be applied in innovative and creative ways within a watershed to achieve the "right" water quality standards. UAAs offer the mechanism to accomplish this and move away from divisive and sub-optimal use of scarce resources to control one pollutant or one source at a time.

Ephraim S. King, Director of EPA's Office of Science and Technology, in a memo to the EPA Regional Water Division Directors (*"Improving Effectiveness of the Use Attainability (UAA) Process"* (March 13, 2006)) encouraged the use of credible and defensible UAAs. In many ways he also set forth the role of UAAs for the future.

MR. KING STATED IN HIS MEMORANDUM:

"Our goal is to make the WQS program work better. Our priority is to improve clarity in the WQS process including better communication, understanding, efficiency, and increased public awareness. Making the UAA process operate effectively is an important step towards achieving these priorities. Once states and tribes designate the appropriate uses, the right water quality criteria, permits and targets for Total Maximum Daily Loads (TMDLs) will follow to move us towards improving water quality.

I appreciate your continued support in this area and ask that you share and reinforce with our co-regulators and stakeholders the following five key points:"

THE FIVE KEY POINTS OUTLINED IN MORE DETAIL IN HIS MEMORANDUM WERE:

- "1. Getting the uses right requires both a useful set of designated uses and an effective process for conducting credible and defensible UAAs. EPA realizes that deciding what uses are attainable is critical, and views the UAA process, properly applied and implemented, as a vital tool in making those decisions.
2. A credible UAA can result in a change in designated use in either direction.
3. There is nothing wrong with changing designated uses after completion of a credible UAA.
4. The UAA process should be better integrated with TMDL development. We need to work together with states and tribes to ensure that as we develop TMDLs, we also coordinate on issues related to use attainability as needed. In practice, the information gathered to develop a TMDL, and the allocations in a TMDL, may point to the need to pursue a UAA.
5. Improved public communication leads to improved public acceptance. It is critical for EPA, states and tribes to engage the public in meaningful discussions regarding the importance and value of getting uses right in maintaining and restoring water quality. WQS that reflect the best available data and information should be used to direct the process of managing water quality. They are essential to informed decision making. Just as important, public understanding and acceptance of WQS is central to broader community support for addressing potentially difficult pollution control management decisions.

Getting the uses right is on the critical path to effective water quality standards implementation."

Getting it right is not a simple or easy process. Allocating massive amounts of private and public resources to achieve the goal of the Clean Water Act is not a simple or easy process. The UAA process offers a useful and under-used tool to getting it right and allocating community resources in the most effective way possible to achieve the goals of the CWA.

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"*Collaborative Water Quality Solutions: Exploring Use Attainability Analysis*" National Association of Clean Water Agencies and the Water Environment Research Foundation, 2005 (Report is available at NACWA, www.nacwa.org)

"*Improving the Effectiveness of the Use Attainability (UAA) Process*" Memorandum, March 13, 2006, Ephraim S. King, Director, Office of Science and Technology, US Environmental Protection Agency

Water System Performance

Performance Issue

Impetus

Capital Intensive

Drinking Water Systems

Combined Systems

Financial Stress

Rate Increases

BEYOND PRIVATIZATION

LESSONS FOR RESTRUCTURING WATER SYSTEMS TO IMPROVE PERFORMANCE

by Gary Wolff, P.E., Ph.D., and Eric Hallstein, The Pacific Institute, Oakland, CA

The performance of water systems in the United States and Canada is an important topic that has been submerged in the debate over private versus public ownership and operation of water systems. Recently, the Pacific Institute took a deeper look at the issue of performance, using examples and original research focused on but not limited to water, wastewater, and stormwater utilities in the upper Midwest, including the US states of Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, and Wisconsin, and the Canadian province of Ontario. The following is a summary version of our research findings, which are fully referenced and documented in a 112-page report available for free download at: www.pacinst.org/reports/beyond_privatization/

CHALLENGES

Four related challenges are prompting water utility restructuring in the US and Canada according to our research: chronic under-investment, regulatory standards and requirements, heightened national security concerns, and limited financial resources.

Chronic Under-Investment

Water-related services are capital-intensive compared to other utilities such as electricity, natural gas, and telecommunications. Measured by the ratio of net utility plant capital costs to annual operating revenues, water utilities are more than twice as capital-intensive as electricity and nearly three times as capital-intensive as natural gas. Due to many years of under-investment—often in underground assets like water pipes and sewers—the US Environmental Protection Agency (EPA) estimates that \$68 billion of water and wastewater infrastructure investment will be needed over the next twenty years in the seven US states covered in our research.

Regulatory Standards and Requirements

Municipalities and drinking water utilities are still responding to the 1996 amendments to the federal Safe Drinking Water Act (SDWA), and a significant number of upper Midwest states (EPA Region 5) and Iowa (EPA Region 7) community water systems still do not meet all EPA health-based standards. Region 5 faces the challenge of ensuring safe water to over 41,000 non-community (e.g., schools, rest stops) water systems, roughly 40% of the non-community water systems in the entire US. These non-community systems typically serve a limited number of people on a year-round basis and require extensive technical assistance relative to the number of people served.

Furthermore, Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin contain 358 of the roughly 750 combined wastewater/stormwater systems in the US. Many of these systems have not yet met minimum federal standards for preventing discharges or received approval for long-term plans to prevent stormwater overflows.

Heightened National Security Concerns

EPA's Action Plan, a collaborative effort between EPA, federal partners, the water industry, public organizations, and the emergency response community, identifies critical research and technical support needs in the area of infrastructure protection. Implementation of the plan will affect nearly every municipality in the US, almost certainly without full federal funding.

Competition for Financial Resources

Cities are financially hard-pressed. The most recent National League of Cities financial survey found that 63% of municipal finance officers believed their cities were less able to meet financial needs than in the previous year, and 61% felt that they would be less able to meet needs in 2005 than in 2004. An even higher percentage (74%) of responding Midwest financial officers felt economic conditions were deteriorating rather than improving. Even those cities and special districts that provide water sector services paid for primarily by their customers (rather than via taxes) are reluctant to raise rates, both because it is politically unpopular and because water and wastewater rates have increased on average two percentage points faster than the rate of inflation since at least 1998.

Average rate increases of about 3% above the rate of inflation for the next 20 years could fund current estimates of needed improvements. Some communities, however, cannot afford to pay that much, and other communities require even higher rate increases to meet their needs. In addition to direct financial limitations, public or political perception problems often exist as well, which involve shortsighted emphasis on minimizing rate increases without considering the benefits that might be obtained if rates were raised and spent effectively.

PRIVATIZATION: A SILVER BULLET?

Water System Performance

Privatization Arguments

Numerous strategies have been proposed to meet these challenges, including privatization, regionalization, consolidation, and municipalization. Privatization of water and wastewater services is hotly debated. Proponents have typically argued that the private sector will deliver more or better services per dollar of cost and often claim that private sector involvement is the best solution for all challenges. Opponents argue that the profit motive will eventually lead to higher rather than lower costs; that workers will lose their jobs or benefits; and that local control over decisions will be diminished or lost. Proponents argue that water services should be supplied by businesses, like food, energy, and other essential goods. Opponents often feel that water is too essential and fundamental a public good to allow much private involvement. Experience summarized or cited in this report helps to clarify these issues. But some of the issues are still unfolding. See Howe & Jacobs, TWR #12.

Trends?

The number of contracts for operation of publicly owned assets tripled in the US between 1997 and 2002. The three largest contracts in the US for operation of publicly owned wastewater assets are located in the Upper Midwest: Gary and Indianapolis, Indiana; and the Milwaukee, Wisconsin Metropolitan Sanitation District. One of the largest, most recent, and most closely watched contracts for operation of publicly owned water assets in the US is also in the region: Indianapolis, Indiana. At least six large or medium-sized companies operate in the region, including the three largest water companies in the world: Veolia Environment, United Water (a branch of Suez, headquartered in Paris), and American Water (a branch of the German firm RWE).

Nonetheless, the heightened interest in privatization has not led to widespread privatization of water systems. There are only about 91 contracts for operation in the region out of more than 4,000 publicly owned systems (see Appendix B of "Beyond Privatization"), although as noted above some of these contracts are very large even by national standards. In Ohio, only three changes in system ownership took place in the 1990s: two municipalizations (public purchase of investor-owned water utilities) versus one privatization.

Small Systems

There are, nonetheless, nearly 4,000 small private water systems in the region, mostly owned by local businesses or groups in situations where water is incidental to the business, such as mobile home parks or homeowners associations. Based on national statistics, these small systems probably serve only 15% of the population in the region. In some states, such as Michigan and Minnesota, these systems are so uncontroversial that they are not economically regulated at the state level, though they are subject to water quality regulation. Even in states that regulate investor-owned water companies, most systems are below the state-by-state size thresholds for economic regulation. Only about 200 investor-owned water and wastewater systems are economically regulated in the upper midwestern focus area of this study.

Economic Efficiency Mixed

Beyond the Privatization Debate

Our analysis of utilities in the Midwest and elsewhere shows that some accepted wisdom should be rethought. Specifically, we find that private sector involvement is not the bright line between success and failure. Researchers have statistically analyzed the question of economic efficiency but have found no clear evidence that private companies are more economically efficient. Both public and private forms of organization have economic advantages and disadvantages, yet neither seems to have an inherent overall efficiency advantage. The bottom line seems to be that public and private agencies both benefit from improvements driven by some form of competition or comparative measurement. A decision on whether or how to involve the private sector needs to be made on a case-by-case basis based on local values and conditions. What works for one community may not work for another.

SIX DETERMINANTS OF SUCCESS

Common Attributes of Success

Our research found six characteristics of high-performance organizations, all of which may be present in public or private (or mixed) forms of organization. Five of the determinants are permanent features of successful organizations: effective staffing, consistently sufficient funding, detailed asset management systems, performance measurements and rewards aligned to organizational objectives, and decision processes that are transparent and open to the public. Figure 1 shows these determinants in their negative form—that is, as causes of problems that require solutions. The bulleted items in each bubble in the figure are solution categories discussed in detail later in this report.

The sixth determinant is relevant to the process of restructuring. Successful organizations avoid “false starts.” Figure 2 shows a process that will be effective if one begins at the “effective start.” An ineffective (sometimes disastrous) beginning is labeled “false start.” The false start is typically a situation where one or more community leaders decide they know the problem and the answer (often, “hire a private company”) and proceed to push that solution through the political process. Because many members of the community are not yet clear that a problem exists, what its symptoms are, what the causes of the symptoms are, and what the range of solution options is, they are often disengaged from the restructuring process, at least initially. When they become involved, they are often disgruntled because these questions have not been answered. Political and legal fights may then erupt, often focused around the role of the private sector. Lawsuits may be filed or referenda to restrict the power of elected officials may be placed on the ballot.

New Orleans, Louisiana and Stockton, California voters approved referenda that require direct approval of the voters for city contracts in excess of a specified dollar sum. Both referenda were in response to false starts in water system restructuring. A judge nullified the contract with a private company in Stockton for operation of the water, wastewater, and stormwater systems shortly after it was awarded, but appeals of the decision have been filed and are not yet resolved. [Editor’s Note: The \$600 million privatization contract with OMI-Thames was voided by a California Superior Court judge in 2003. In the meantime, however, OMI-Thames continues to control the city’s water system.]

Figure 2 shows six steps that our research found are typical of successful processes regardless of a municipality’s size, problems, or choice of solution. The first three steps are often neglected and are therefore discussed extensively in this report. False starts or incomplete processes can lengthen, increase the cost, or increase the contentiousness of restructuring. Process is an area where some communities have been penny-wise but pound-foolish. Rigorous adherence to a comprehensive, well thought out process will benefit any community, regardless of size. Even small communities facing severe resource constraints will fare better if they avoid skipping any of these necessary steps.

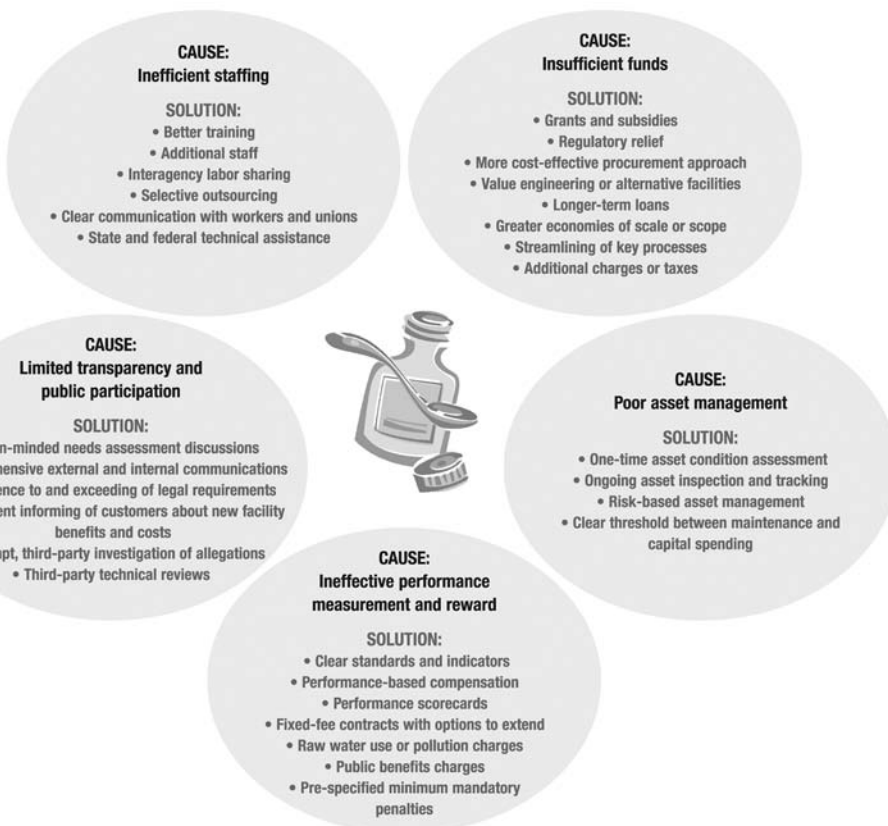
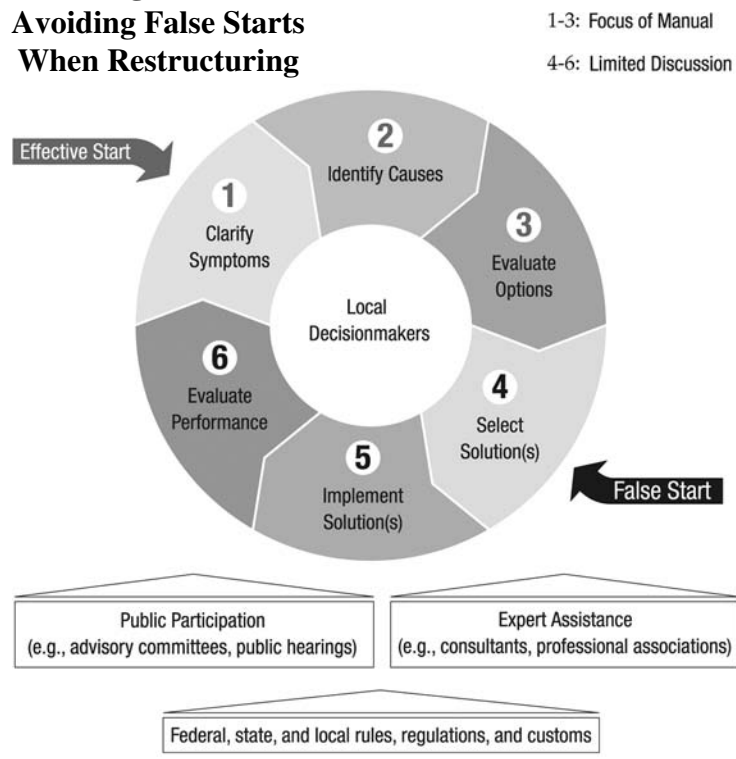


Figure 1: Guide to Solution Options

Figure 2
Avoiding False Starts
When Restructuring



RECOMMENDATIONS

Water
System
Performance

Positive Actions

The Pacific Institute's report recommends actions that decision makers should make, and others that they should avoid, grouped under the six determinants of success. The "Do" items emphasize positive actions, while the "Do Not" items highlight larger mistakes to avoid during water system restructuring. Our primary objective is to help communities learn from the experiences of others. There are many ways to succeed so long as major mistakes discovered in other venues are avoided. Some of the recommendations clearly demonstrate that the choice of public or private form of organization is not critical to performance — although that choice is an important value decision in some communities.

Avoid False Starts

INVOLVE PEOPLE WITH A WIDE VARIETY OF BACKGROUNDS & AGENDAS IN THE ANALYSIS OF SYMPTOMS AND CAUSES

People's perspectives naturally tend to reflect their professional training and may also reflect their own personal agendas (e.g., job security). A widely representative group of people will tend to synthesize these perspectives into more-robust, and perhaps unexpected, solutions. Broad participation also builds support for potentially controversial solutions and reduces the cost of defending decisions after they are made. For example, the Lansing, Michigan Board of Water and Light successfully used a task force to develop a regional solution that captures economies of scale but maintains local control.

IDENTIFY EXACTLY WHICH PROBLEM SYMPTOMS RESTRUCTURING MUST SOLVE

The Milwaukee Metropolitan Sewerage District (MMSD) knew their primary challenge was to control the cost of constructing and operating new facilities to reduce combined sewer overflows. Consequently, they focused on solutions that seemed likely to control cost and reduce financial risks. Detroit, Michigan knows that their asset base is very large and costly to operate and maintain; consequently, they are focused on developing a better understanding of the condition of their assets and development of plans for future repair, maintenance, replacement, or expansion of assets.

DETERMINE COMMUNITY WILLINGNESS TO PAY FOR VARIOUS LEVELS OF SERVICE IMPROVEMENTS DURING PLANNING

"Technocrats" often decide the level of service they think involves a reasonable balance of benefits with costs. For example, the MMSD has spent more than \$2.2 billion to reduce sewer overflows from 50+ incidents per year to around 2-3 per year. In another case, Sioux City, Iowa's specifications for odor control at their new wastewater treatment plant suggest that no more than six odor complaints per year are acceptable. However, in Milwaukee, Wisconsin, some citizens have perceived even a few overflows per year as too many, and some citizens in Sioux City may feel the implicit standard for odor control is too lax. An important part of the restructuring process is to be sure that community members are aware of the benefit-cost tradeoffs involved in selecting a targeted service level, and that the final choice of service level reflects community values, not just technical experts' opinions.

FIGURE OUT AFFORDABILITY FOR COMMUNITY GROUPS IF CURRENT OR FUTURE RATES ARE BELIEVED TO BE TOO HIGH

Unless a community knows who will have a hard time paying projected future rates, it cannot work effectively to prevent that hardship from occurring. In addition, affordability includes some subjective opinions, so clear descriptions of assumptions and results of analysis are especially important. The Rural Community Assistance Partnership (RCAP) has assisted many small communities to define and respond to affordability problems (see website: www.rcap.org).

Do not jump to solutions before considering symptoms, causes, and the full range of solution options

Stockton, California had minimal community involvement prior to issuance of a request for proposals. The decision that a private operator was the best solution was made without the informed consent of a wide range of stakeholders. This is an example of the "false start" problem described in the best practice process, above. The consequence has been a costly court battle and approval of a citizen referendum that requires all future large contracts to obtain citizen approval. This is arguably a poor way to run a city, but a majority of citizens felt it was the only way they could affect the political process.

Do not assume the private sector is inherently more efficient or less costly

There is no published statistical analysis to support this claim. There are cost factors that both drive up and drive down private company costs relative to public agency costs. When cost savings exist, they result from some specific circumstance that can be identified and evaluated, not an inherent advantage of private over public. For example, the successful bidder in Stockton, California is far more experienced than other bidders and public agencies at operation of a particular type of wastewater process—experience that allowed them to bid \$20 million less for capital improvements than the second-lowest proposal and to provide financial guarantees for their proposed method of wastewater treatment.

Do not assume public agencies can be as efficient as private ones without a strong culture of performance

Although it is true that many of the methods of improving efficiency can be executed by private

Broad
ParticipationProblem
IdentificationWillingness
to Pay

Costs-Benefits

Affordability

False Start

Avoid
AssumptionsPerformance
Culture

Water System Performance

Cost Estimation Fallacies

companies or public agencies, implementing such changes in public agencies requires a strong culture of performance that is too often absent. In both Akron and Butler, Ohio, the key to achieving better performance was to undertake time-consuming and challenging culture changes, with some mistakes along the way.

Do not let estimates of cost savings dominate decisions

There is more than one reason a community might want (or not want) private involvement in their water system. Estimates of future cost savings from any course of action, private involvement or otherwise, are uncertain for a variety of reasons and become more uncertain during the planning period (e.g., 10-30 years). It is important to make such estimates and to include them in the decision process. But the fallacy of misplaced concreteness should be avoided. Estimates are only as good as the assumptions and data involved and are only one dimension of an important decision with non-financial consequences for the community. Promising enormous savings, then having to raise rates later because the assumptions underlying the estimates turned out to be incorrect, undermines community support for needed investments over time.

For example, about \$38 million of estimated operational savings in the 20-year Stockton contract resulted from assumed future rates of inflation well below the average actual rate in the last 20 years. If future inflation is like past inflation, none of these operational savings will materialize; in fact, private operation may cost about \$2 million more than public operation was estimated to cost.

Do not assume the private sector can or will carry risks at lower cost than public sector

Risk Assumptions

This may have been true a few years ago when private companies were very eager to enter the water market, but the appetite for risk of private companies seems to have recently declined dramatically. Both Sioux City, Iowa and Hamilton, Ontario report companies asking for significant payments if they are to take on risks normally carried by the municipal owner of assets. In Hamilton, the final decision to return to public operation was driven in large part by the fact that the "risk premium" included in the one proposal that met all technical standards was approximately \$25 million per year, which was equal in size to the city's previous annual payment for private operation and its own estimate of the annual cost for operation with public forces. Companies may be capable or willing to bear risks for less than a municipality can, but there should be a plausible rationale for that (e.g., preferential rates from insurers due to a company's operating history or size) rather than assumption.

Staff Effectively

IMPROVE WORKER PRODUCTIVITY AND REDUCE EXCESS JOBS (IF ANY) BY INVESTING IN HUMAN RESOURCES

Work Force Productivity

There are many reasons that public agencies can develop too many or the wrong kind of staff over time. Paradoxically, investing in people can be the best way to effectively reduce a workforce, either through attrition or transfer to more appropriate jobs elsewhere in government service. The Akron Public Utilities Bureau in Northeast Ohio learned that training tailored to their employees and their jobs, including development of a specialized training program with a local university, was an effective way to reduce labor costs with no harm, and many benefits, for workers.

CONSIDER OUTSOURCING NON-CORE FUNCTIONS

Outsourcing Options

Hiring a private contractor to operate an entire system can be an appropriate solution. But so can outsourcing of non-core functions rather than the entire operation. The Butler County, Ohio, Department of Environment Services helped control its operating costs by outsourcing payment processing, a non-core function that others are more efficient at doing.

COMMUNICATE CLEARLY WITH WORKERS AND UNIONS, IF LARGE NUMBERS OF JOBS ARE TRANSFERRED BETWEEN EMPLOYERS (E.G., PUBLIC TO PRIVATE, OR PRIVATE TO PRIVATE DURING A CONTRACT TRANSITION)

Work Force Communication

The MMSD developed a standard form contract that was reviewed and approved by the union prior to solicitation of proposals for operations. The Indianapolis Wastewater contract had similarly effective and clear communications. Unfortunately, the Indianapolis water transition involved conflicting communications about benefit levels for workers that created tension that could have been avoided. (The operations contract called for the value of benefits to be maintained, while the mayor had previously stated that benefits would be unchanged. To this day, the contractor and the union differ on how to calculate the value of benefits).

PLAN FOR ADDITIONAL CONTRACT MANAGEMENT PERSONNEL IF OUTSOURCING, ESPECIALLY FULL OPERATIONAL CONTRACTS

Contract Management

As a taskforce of the National Research Council has pointed out, the skills to manage a contract are entirely different from those required to manage an operation. The MMSD budgeted for a contract management team staffed at a level equivalent to three to four full time employees. This expense was small compared with their anticipated savings of \$1 million per month.

Water System Performance Encouraging Innovation Appropriate Management Economies of Scale Procurement Structure Credibility Cost Control	IN SMALLER COMMUNITIES, INVEST IN STAFF CAPACITY TO MANAGE TECHNICAL SPECIALISTS AND CONTRACTORS Smaller communities cannot afford multiple employee teams to manage contracts. In some cases, employees responsible for contract management have many other unrelated duties. Given these time constraints, ensuring that staff has been professionally trained in contract management (there are numerous courses offered on this topic) is likely to be an extremely effective financial investment. <i>Do not punish public employees who take reasonable risks in an attempt to control costs</i> Those who have worked for public agencies know that risk-taking is not often rewarded. It is critical that public agency employees be encouraged and empowered to take reasonable risks without fear that their careers in public service will forever be damaged should negative results occur. Senior managers and elected officials need to support social entrepreneurship. Although this topic has been widely discussed and was mentioned by several interviewees, we unfortunately did not find any clear-cut examples of how a public agency can implement this cultural change. ALIGN MANAGEMENT PERSONNEL WITH COMMUNITY EXPECTATIONS The particular people involved in any situation are a critical element of success or failure. The MMSD contract requires that replacement of the local private company manager must be approved by MMSD, an action that has taken place once without event. The Indianapolis contract for water operations does not seem to have this type of clause, and some citizens in Indianapolis have blamed changes in the private company senior management team for a variety of problems. We cannot evaluate the accuracy of these claims, but note that it is not unusual in some types of contracts to specify named persons who will perform the contracted for services, precisely because the choice of manager or professional can be critical to getting the desired results. There are also examples of companies that did well in City A but not in City B, while another company did well in B but not in A. There are a variety of possible explanations for such patterns of performance, but some causes that should be considered by anyone thinking of contracting for services are the cultural fit between a community and the various proposers and the particular persons proposed to manage the services. Ensure Consistent and Adequate Funding CONTROL COSTS BY LOOKING FOR AND CAPTURING ECONOMIES OF SCALE AND SCOPE Small communities are perhaps the most challenged, financially, in the focus area of this study. One very effective way to reduce cost is to identify and capture economies of scale or scope, through cooperative arrangements or outright consolidation with other public agencies or private companies. The Lansing Board of Water and Light reportedly achieved greater economies of scale in its core operations through a combination of retail contracts to manage other operations, wholesale contracts to resell water, and asset transfers from other municipalities to the Board. Some other functions, primarily in distribution, remained with the towns. The “hub and spoke” area project with Veolia has reportedly allowed the towns of St. Michael, Albertville, and Hanover to benefit from the economies of scale within Veolia. CONTROL COSTS THROUGH INNOVATIVE PROCUREMENT STRUCTURES One of the drivers of private sector involvement has been the potential for cost reduction from using the design-build (DB) approach rather than the traditional design-bid-build (DBB) approach. But DB involves some risks that DBB does not, which is one reason that DB is not legal in some states. The design-build-operate (DBO) approach is one way of addressing the risk issue associated with DB, but there are other innovative procurement structures that may also reduce cost and manage risk effectively. Sioux City, Iowa is using a design-operate (DO) approach rather than DBO, because DB is illegal in Iowa. And a DB approach, with an option to award an operational contract if the DB work is completed in a superlative manner, has been used in Cle Elum, Washington. The incentive power of the operational option was apparently used successfully to offset the incentive for the DB contractor to use lower-quality materials or otherwise cut corners in design and construction. MAINTAIN FINANCIAL CREDIBILITY BY DISCUSSING THE VALUE OF WATER SERVICES WITH CUSTOMERS PERIODICALLY Customers are well aware of the bills they receive. They think less often about the benefits of the services they receive. Discussing with customers the value of these services, and the value of other services that might be provided, provides a pathway for continuous improvement in the services offered. It also builds a mutual understanding of the cost of maintaining the system, which in turn makes rate increases — when needed — much more politically palatable. This communication effort should be part of an ongoing, permanent communication program, as in some examples discussed below. <i>Do not fail to control costs by assuming that bigger is always better</i> Economies of scale are important to identify and capture. But they do not always exist or sometimes exist but are difficult to capture. They may not be relevant to all functions or services, or the effort to
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Water System Performance

Contract Risks

develop economies of scale may not have a large impact on the organization if the costs represent a very small portion of the overall organization's costs. Focus on functions where there are clear economies of scale and where the impact is greatest on the overall financials. For example, Newport, Kentucky sold its system to another public agency in an attempt to reduce costs through consolidation but has since incurred large rate increases.

Do not fail to control costs by underestimating potential contract risks

Entering into a contract involves risk, just as getting married creates a risk of divorce that does not exist for single people. A good contract is essential; but enforcing or defending even a good contract can be costly. Although termination for convenience options with a lump sum termination payment—a recent innovation in these types of contracts—makes exiting a contract relatively simple legally, they still involve costs and risks. Every transition, whether from public to private or private-to-private hands, etc., involves risk. Advocates of private contracts sometimes claim that the private utility or private operator is assuming all risks. That is simply not possible. For example, although the transfer of risk to the private contractor in the City of Stockton water/wastewater/stormwater agreement is quite impressive, the city has nonetheless been involved in litigation over the contract since it was awarded. Entering into the contract created a risk that did not exist prior to the contract award.

Manage Assets Better

Asset Inspection

INSPECT ALL ASSETS, ESPECIALLY UNDERGROUND, PERIODICALLY AND ESPECIALLY WHEN CONSIDERING A CONTRACT

One of the biggest drivers of future water utility costs is the current poor condition of assets; especially underground assets that have not been visually or otherwise inspected in many years. Atlanta, Georgia found to its regret that the relatively unknown condition of its underground water assets was a constant source of tension with the company hired to run its water system; eventually, the contract was terminated at least in part due to arguments over who should bear the costs of repairing these assets. Even if an operational contract is not being considered, periodic inspection of every asset in the system is one of the most important steps a utility can take to control future costs.

TAILOR THE ASSET MANAGEMENT SYSTEM TO THE NEEDS OF YOUR UTILITY

Asset Management

Well more than half the cost of most water systems is related to capital investments and their maintenance. If you do not know their condition based on direct observation or testing—especially underground assets—neither public nor private operators will be able to control costs or prevent unexpected service problems. That said, it would be inappropriate for a small rural system to employ fully developed risk management tools, just as it would be inappropriate for a very large utility to be satisfied with an accurate inventory of assets. For example, Detroit, Michigan, a large city with millions of customers, used a relatively complex combination of risk-based asset management tools to create its capital improvement plan; by contrast, Mesa Consolidated in California, a small utility with fewer than 25,000 accounts, has limited itself to ongoing asset inspection and tracking.

Do not under-invest in capital projects because it is easier to do so

Long-Term Investments

This decision is usually in part a public decision, even when a private operator or utility is involved. It takes political will to make long-term investments. It is difficult to raise rates. Nonetheless, that is sometimes necessary. Greater efficiency or other techniques to reduce cost cannot solve all problems without rate increases. The MMSD, for example, seems to have controlled costs by hiring a private contractor but also needed to spend \$2.2 billion, plus interest, to upgrade wet weather sewer facilities. While not an easy process, the officials of MMSD were able to work with their community to develop support for these expenditures.

Do not sell public assets without a buyback clause in the contract

By-Back Clause

As Pekin, Illinois has discovered, using eminent domain to condemn and purchase the assets of an investor-owned water utility is not simple. Although Peoria, Illinois has recently chosen not to purchase the assets of the investor-owned water utility that serves them because the appraised value was too high, their right to purchase those assets was established by an old contract in which they sold the original public system to the predecessor of the current investor-owned utility. Their situation, legally, has been easier than that of Pekin. Newport, Kentucky recently sold its water system to a regional agency, which has since raised rates far more than was expected at the time of sale. If Newport had the authority to repurchase those assets, they would have more options to control recent or future rate increases.

Do not think excluding the private sector from water system operations or management maximizes public control

Public Control Assumptions

Ownership of assets and responsibility for day-to-day operations are dimensions of control. But inadequate skill or poor knowledge of the condition of assets, which means they might break or fail to operate unexpectedly, are also dimensions of control. Excluding the private sector does not address all

Water System Performance

Performance Rewards

factors that reduce control over the system. For example, in the Atlanta, Georgia water contract, neither the city nor the private contractor had much control over costs associated with deteriorating underground assets. Increased control of assets requires at minimum that you know with certainty which assets exist and their condition, regardless of ownership.

Measure and Reward Performance

MEASURE AND REWARD (OR PENALIZE) PERFORMANCE APPROPRIATELY

Management structures that do not measure and reward achievement of performance objectives inevitably become inefficient. Performance bonuses are one way of rewarding private companies, as is allowing them to keep any cost reductions they achieve below a fixed fee that is paid for their services. Performance penalties in a contract, such as those for odor complaints in the Sioux City contract, are also beneficial. But performance measurement, rewards, and penalties are also appropriate in public systems. The City of Baltimore CitiStat system has saved more than \$100 million since its inception in 2001. Louisville Water in Kentucky, a public corporation, has used bonuses at all levels of the utility to increase efficiency and to create a culture of performance among its staff. In the case of public utilities, even if bonuses are not legal or appropriate, promotions and continued employment can be clearly linked to achievement of performance objectives. In all cases, these measures and rewards need to be tightly linked to the overall strategic goals of the municipality or organization.

FOCUS PERFORMANCE SPECIFICATIONS ON CRITICAL ISSUES

Focussed Performance

It is not possible to measure every performance dimension, especially in smaller communities. But one can focus performance specifications, and rewards or penalties as appropriate, on the most critical issues identified in the best practice process described above. In Sioux City, Iowa, for example, the contract for operation of a new wastewater treatment facility includes an 18-page specification addressing odor control.

REPORT PERFORMANCE MEASURES TO THE PUBLIC PERIODICALLY

Public Reporting

Public reporting of performance measures is an effective way to keep managers, both public and private, on their toes. The Australian water industry has used this technique to ensure that its publicly owned water corporations are nonetheless subject to competitive pressure from the public. For example, if a water retailer is slower in responding to customer complaints than other retailers in other cities, citizens and businesses will know that and can question whether it is reasonable or not, given local circumstances.

PREPARE OPERATIONAL SPECIFICATIONS FOR A CONTRACT, EVEN IF PRIVATE OPERATION IS NOT BEING CONSIDERED

Operational Specifications

Hamilton, Ontario made an interesting discovery in late 2004. When they did not obtain a desirable bid for continued operation of a system that had been operated privately for more than a decade, they decided to operate the system with public forces in accordance with specifications they had prepared for solicitation of bids. The existence of the specifications is anticipated to create greater accountability for the public operation than would normally exist. Although this situation was accidental in Hamilton's case, it suggests that preparation of operational specifications for a system may be beneficial even when private operation is not being considered. Doing so can also serve as an objective basis for performance measurements and rewards or penalties, as described above.

Make Decisions in Open and Transparent Processes with Public Participation

MAINTAIN PUBLIC INVOLVEMENT AND COMMUNICATIONS ON A PERMANENT BASIS, NOT JUST DURING RESTRUCTURING

Public Involvement

Public involvement and communications is important on a permanent basis, not just during restructuring. Both Butler County and Akron, Ohio have developed extensive communications plans and procedures that they report have been well worth the effort, both during and since they restructured their water systems. All of the problems discussed in this manual—especially labor relations and inadequate public support for needed investments—will be easier to solve if continuous communications have been taking place. The public is unlikely to respond positively when asked to support a rate increase if they have not heard from you in years.

AVOID EVEN THE APPEARANCE OF CORRUPTION

Corruption Control

Even the appearance of corruption can create enormous costs for a community. For example, people may refuse to support rate increases even though they know new capital facilities are needed. One way to prevent even the appearance of corruption is to strictly adhere to a formally adopted decision process. Hamilton, Ontario did this and has survived a difficult transition from private to public operation—including some legal challenges—with minimal cost and political upheaval. Another way to prevent corruption is to be certain that sufficient time, competition, and public notice are involved with restructuring decisions. Some of these characteristics were not part of the decision process in Lafayette,

Water System Performance

External Review

Indiana; Stockton, California; or Indianapolis, Indiana. All three communities have subsequently become embroiled in costly legal and political conflicts, including accusations of corruption.

PERFORM PERIODIC THIRD-PARTY ASSESSMENTS

External review is more credible than internal review, although the latter is also important. The City of New Orleans and the MMSD have successfully used third-party reviews to improve their performance and to build credibility across a wide range of stakeholders. The technical advisory committees (TACs) in the City of Indianapolis were specified in the operating contracts for this purpose. The TAC for the wastewater contract seems to have functioned reasonably well in that regard, but initial understaffing and commitment to the TAC function in the water contract has been a problem. Contracts should include a requirement for external review, and public agencies should commit to periodic external review as well. Unfortunately, the contracts we reviewed did not include this type of requirement.

EXCEED MINIMUM LEGAL REQUIREMENTS

In some states, contracts for municipal operations are not necessarily public documents. Similarly, codes of conduct for municipal employees are often not required by law. But exceeding the minimum legal requirements can greatly enhance the credibility of a utility or government agency, creating social capital that is valuable when a serious problem emerges. The City of Toronto, for example, recently fired employees for violating a code of conduct related to possible corruption, even though the employees had not yet been indicted or convicted. Similarly, there is much to be gained and little to be lost by making all final city contracts public.

CONCLUSION

The debate over water privatization has overshadowed discussion of methods for achieving real, tangible performance improvements regardless of whether the utility is public, investor-owned, or somewhere in between. While values and beliefs certainly have their place in any decision about utility restructuring, allowing values and beliefs to overshadow the factual and analytical part of the decision often leads to costly outcomes that polarize and divide communities. Experience in the upper Midwest shows that the better-performing utilities have a number of attributes in common.

TOP-PERFORMING UTILITIES:

- Have staff in the right numbers and of the right kind
- Know what assets they own and the condition of those assets
- Are consistently funded at adequate levels because they use a wide range of techniques to control costs and to maintain financial credibility with their communities through continuous communication
- Measure performance and provide rewards or penalties as appropriate in order to ensure that staff at all levels are encouraged to either improve the quality or reduce the cost of service
- Make decisions in open processes, with transparency and public participation and periodic third-party reviews, thereby avoiding even the appearance that corruption or “private agendas” are driving the decision process
- If restructuring is needed, avoid a false start by identifying the symptoms and underlying causes of the problems people are facing—and discussing the full range of solutions that might be implemented—*before* deciding to undertake potentially controversial actions such as changing from a public to private or a private to public utility structure.

The choice of public versus private structure is important because it involves social values such as public health, affordability of essential services, and the general approach of each community to satisfaction of basic needs. But our research shows that with respect to performance—how much or how many services get delivered per dollar of rates paid by customers—the choice of public versus private is not nearly as relevant as the bulleted points above.

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Exceeding Requirements

Attributes of Success

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The Pacific Institute was founded in 1987 and is based in Oakland, California. The Institute is an independent, nonpartisan think-tank dedicated to protecting the natural world, encouraging development, and improving global security. The Institute provides independent research and policy analysis at the intersection of development, environment, and security.

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Nogales Wastewater

Grant Agreement

Infiltration& Inflow Problems

Effluent Issues

Dual-Nation Sewage

Co-Owners Relationship

Sole Funding Recipient

Limited Options

NOGALES WASTEWATER TREATMENT

INTERNATIONAL ISSUES IMPACT PROGRESS

by Joe Gelt, Editor, Water Resources Research Center (Phoenix, Arizona)

On December 14, 2005, the North American Development Bank (NADBank) and the City of Nogales, Arizona, signed a \$59.5 million grant agreement for the City to upgrade the Nogales International Wastewater Treatment Plant (NIWTP). Opened in 1972, the plant is located 14 kilometers north of the US-Mexico border along I-19 in Santa Cruz County, Arizona. The signing prompted NADBank Managing Director Jorge C. Garcés to state, "We are pleased to have finalized this important step, which will allow these improvements to the NIWTP to begin next year."

The step Garcés mentions as being finalized was merely the latest step; many other steps were taken over about a ten-year period to reach this point. It has in fact been a long rocky road, involving government agencies at the local, state, federal and international levels, a foreign country and a mix of legal, political and environmental issues. Border issues are notoriously complex.

Plant's Deficiencies

Structural and hydraulic capacity deficiencies with the wastewater collection system have allowed excessive amounts of extraneous water to enter the system as infiltration and inflow, as well as resulting in wastewater outflows to the environment. Untreated wastewater escapes into the groundwater table and into Nogales Wash, a tributary of the Santa Cruz River. The river flows north into Arizona.

Conditions become especially onerous during rainy seasons, with the treatment plant often receiving polluted wastewater and runoff beyond its capacity of 17.3 million gallons per day (mgd). At such times, the plant can receive up to 28 mgd.

The plant lacks the capacity to handle heavy flows and is unable to adequately control nitrogen and ammonia discharges during high flow periods. The presence of inorganic substances such as arsenic and mercury in discharges have resulted in water quality violations.

The effluent quality limits for the plant are being revised, with the proposed National Pollutant Discharge Elimination System permit calling for the reduction of toxicity to aquatic life. This implies a reduction of ammonia concentrations in the effluent. Of further concern is the potential impact of effluent high in total nitrogen concentrations; the remaining ammonia will likely be transformed to nitrate, posing a threat to potable water wells downstream of the plant.

Planning Efforts Begin

Efforts to administer NIWTP are complicated by the fact that the facility treats wastewater from both sides of the US-Mexico border. In fact, NIWTP has the distinction of being the only such plant with a dual country waste stream. One effort to coordinate treatment occurred in the mid-1990s when the US Environmental Protection Agency (EPA) sponsored a binational wastewater management planning effort. A committee examined various options including whether to treat Mexican sewage in Mexico, in the existing facility, or to operate plants in both countries.

Plans for major renovations to NIWTP took shape. In 1995, a US-Mexico agreement was worked out, with the project concept certified by the Border Environment Cooperation Commission. EPA also authorized a \$60 million grant to cover a portion of the costs. It was necessary to forge an agreement among all the interested parties. This can be a potentially formidable task when an international project is at issue, and the task lived up to its troublesome expectations.

The City of Nogales, Arizona, and the International Boundary and Water Commission (IBWC) needed to agree on the details of the project. As co-owners and operators of NIWTP they have had an established working relationship, but it is one that has been marked by controversy and conflict over a range of topics. A mix of other government agencies also had a stake in the operations of the plant. Working together was critical to get funds released and improvements underway.

Controversial Issues Block Progress

Hugh Holub, City of Nogales special projects director, said an especially troublesome issue for Nogales was that the City would be the grantee or sole recipient of the funds and, thus, responsible for the completion of the project since IBWC is not eligible to receive funding. Holub said the City was placed in an uncomfortable position as the minority owner of the plant — the City uses about 23 percent of plant capacity — yet responsible for the completion of the project if it runs over the allotted \$59.5 million.

Having the City of Nogales being the only eligible grantee further restricted the City's options. Holub said, "Our original solution was that we wanted our own plant and they would build their plant, but that got rejected. With the ruling that IBWC was not eligible to receive funding there would have been no money to deal with the international [wastewater] problem." However, a shared facility apparently has cost-benefit advantages.

Arizona-Mexican Border

Source:

Sprouse, Terry. 2005.

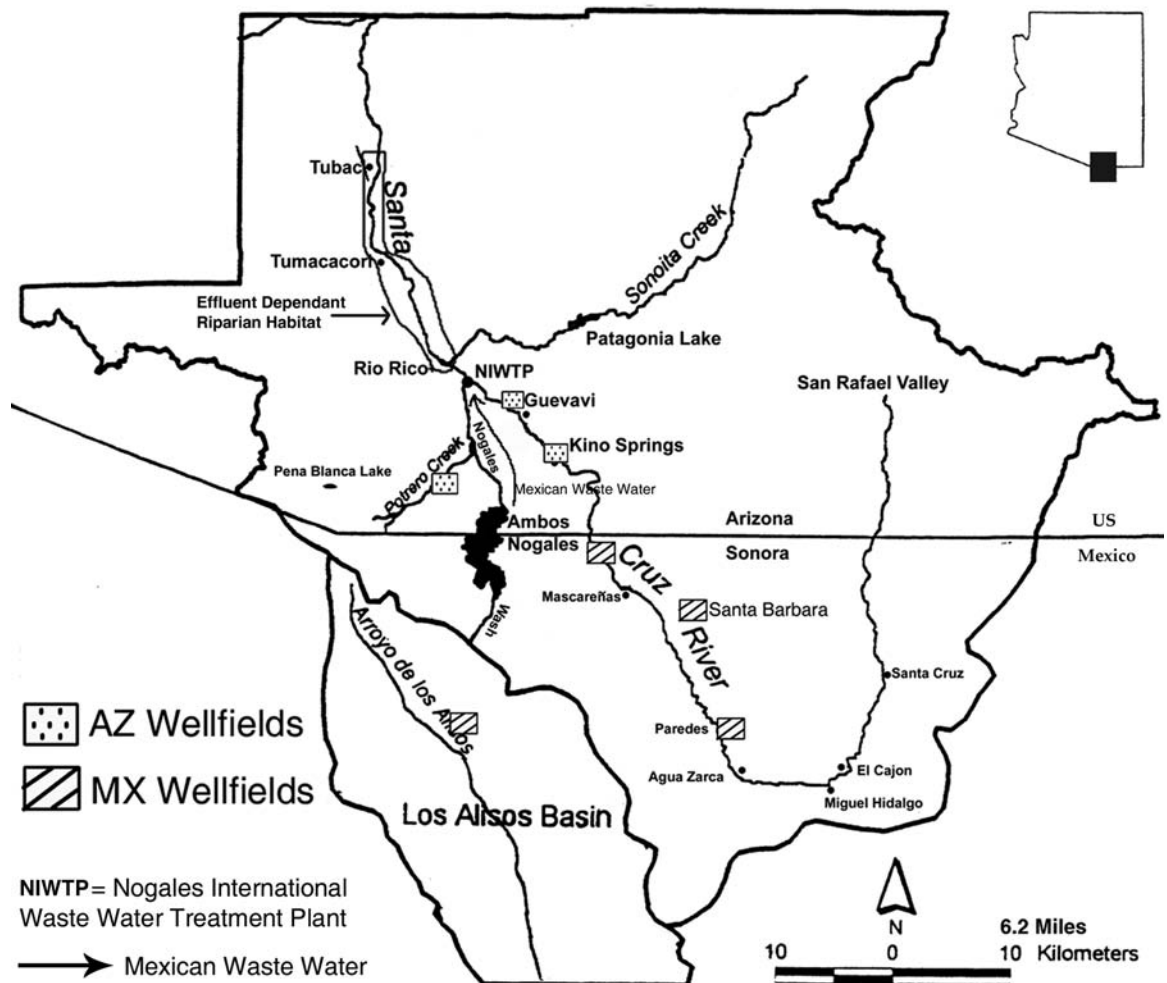
"Water Issues on the Arizona - Mexico Border: The Santa Cruz, San Pedro and Colorado Rivers."

A Water Resources Research Center Issue Paper

Tucson, Arizona

Water Resources Research Center

University of Arizona



O & M Costs

Operational money also is an issue. EPA pays the capital costs for the facility's upgrade; IBWC, Mexico and the City of Nogales are expected to pay the operational and maintenance (O&M) costs. These costs are expected to increase with the renovated plant, from the current \$1.5 million to approximately \$2.5 million. Holub said that the City was justified to expect that IBWC and Mexico would pay a large share of the O&M costs since treating Mexican wastewater takes about 77 percent of plant capacity. Mexico, however, refused to pay the increased costs, much of which would be used to meet US water quality standards that do not apply in Mexico. Whatever funding IBWC might receive for O&M costs would come from Congress, with all the uncertainties that entails.

Talks stalled over the lack of assurances that adequate funds to cover O&M costs would be forthcoming. None of the major parties involved — EPA, the City of Nogales and Mexico — would be able to cover all the costs. With no immediate solution at hand, the parties agreed to work together with the resources that had been committed, as best they could.

Plant treatment capacity also was an issue. An agreement between Mexico and the US (Minute 276, IBWC 1988) set the allocation for Mexico of 9.9 mgd of wastewater to the plant. This amount is often exceeded. Mexico could be allocated an amount beyond 9.9 mgd if it agreed to pay for increased treatment capacity. Mexico has chosen not to pursue this option, preferring instead to build its own treatment facility. Mexico's view is that paying to expand the capacity of NIWTP enables the United States to take more of Mexico's treated water, whereas if it built its own treatment plant it could keep the treated water for other uses. Mexico has begun work to design pumping stations and a treatment facility. It is not yet clear when this planned infrastructure will be operational.

This decision makes the City of Nogales nervous. Officials fear that a Mexican wastewater flow in excess of 9.9 mgd could result in the City losing some of its capacity at the plant. The issue gains special importance since the City's capacity in the renovated plant has been cut back to 4.1 mgd from its current 7.3 mgd. The City, however, believes this a manageable capacity if it is able to solve the inflow and infiltration problems on the International Outfall Interceptor (IOI). Herein lies another troublesome issue.

Treatment Capacity

Water Re-Use

Nogales Capacity

**Nogales
Wastewater****Health Hazard****CWA
Consent Decree****ADEQ
Leadership****Conflict
Resolution****Committee
Success****Litigation
On Hold****Funding
Threat**

The IOI is a pipeline that transports wastewater originating in both communities to NIWTP. The IOI is in serious need of repair — breaks in the line leak wastewater into the environment and allow extraneous water to enter the system as infiltration and inflow. The City of Nogales has some federal funds to repair the IOI, but additional funds may be needed to get the work done.

Progress Mandated

While some issues awaiting resolution delayed progress, other developments provided impetus to resolve the conflicts and begin work on the facility. For example, the plant posed an environmental and public health hazard, with illegal high discharges into the Santa Cruz River and polluted runoff entering the Nogales Wash. The situation becomes even more critical during the high flows of the rainy season. Action was clearly called for.

Also urging action was a court decree. In March 2000, the Sierra Club filed suit alleging ongoing and continuous Clean Water Act violations at NIWTP. The result was a court-approved consent decree that the NIWTP's operations be brought into compliance with federal public health standards by 2004 (see Case No: CIV-00-184-TUVC-RCC). The deadline came and went, with no remedial actions taken.

Added to the above was the threat that funding could be lost. The money allocated to the project in 2000 was still unspent. With federal funding now more difficult to obtain, EPA began to look at the unspent \$59.5 allocated to NIWTP as a possible source of funds for use in other US-Mexico border projects that showed progress. This use-it-or-lose-it dilemma made it clear that something would soon need to be done to get the City of Nogales project moving.

The Arizona Department of Environmental Quality (ADEQ) took the funding threat very seriously. The agency was anxious that water quality standards be met and permitting violations resolved. ADEQ became actively involved in the planning process, taking on a leadership role in bringing the parties together. The US Institute for Environmental Conflict Resolution was engaged to conduct conflict resolution sessions. Involved in the sessions were ADEQ, the City of Nogales, IBWC, EPA-Region 9, NADBank and the Border Environment Cooperation Commission.

ADEQ Makes a Difference

According to those most knowledgeable about the situation, ADEQ assuming a leadership role proved to be a turning point in getting the various parties to adopt a more conciliatory attitude and be willing to negotiate issues. Also contributing to the conciliatory mood were the conflict resolution sessions. These developments provided a needed fresh start.

Policy and technical committees were formed to help accomplish needed work. The technical committee was chaired by Chuck Graf from ADEQ and made up of senior engineers of the involved organizations. It was especially effective in forging a working relationship among all the interests. To focus their efforts they concentrated on engineering issues, avoiding as much as possible the more controversial topic of funding. That would be addressed later.

The technical committee scored an early success that demonstrated the value of teamwork and established a sense of momentum to take on other tasks. The success involved the daunting issue of the leaking IOI. Plans initially called for its replacement, a project estimated to cost about \$40 million. That expenditure would have drained much of the funds needed for work on NIWTP. The technical committee studied the problem and concluded that the IOI could be repaired rather than replaced. This determination cut the estimated cost of solving the problem by half — down to \$20 million.

The technical committee was then ready to take on NIWTP, eventually achieving a consensus on the technical specifications of the project. This was a major step toward getting work started on the plant.

One indication that progress is being made is reflected in the position taken by the plaintiffs in the case that resulted in the unmet consent decree. Joy Herr-Cardillo, the attorney representing the Sierra Club, has stated, "...as long as real progress is being made we have not gone back to the courts. As long as the parties are in good faith moving forward then the plaintiffs are satisfied."

Karen Smith, who was involved in the project when working with ADEQ, believes the outcome was a "huge success." She pointed out that, "From my experience it is unusual because it has been successful. You can go along the border and see nightmares from Tijuana on, where you have projects with this many organizations trying to come to an agreement. It is very tough."

Funding Agency Issue

The feelings of success shared by those involved in the process were later tempered in the face of a threat to NADBank, the agency that was to fund the upgrading of NIWTP. Plans seemed to be afoot to abolish NADBank, at the instigation of US officials or Mexican officials, or possibly both. The threat was sufficiently serious that leaders concerned with border affairs joined to express support for NADBank, with eight congressional members submitting a letter to Treasury Secretary John Snow in March expressing concern about NADBank's continued operations. Governor Rick Perry of Texas (R)

Nogales Wastewater

joined the others in expressing his support. The effort seemed to have been successful and NADBank has been saved — at least for the time being. Some view it as a temporary reprieve, however, and not a solution. They believe threats to NADBank will be a recurring problem.

Is it at least assured that NADBank will be there to fund the City of Nogales project? Robert Varady, deputy director of the University of Arizona's Udall Center for Studies in Public Policy and a member of the Good Neighbor Environmental Board, a federal committee advising the president and Congress, noted, "It is probably a little too soon to be cocky about that."

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Joe Gelt is the editor of Arizona Water Resource newsletter, published by the University of Arizona's Water Resources Research Center. He is a journalist specializing in state and regional water issues.

INTERNATIONAL BOUNDARY AND WATER COMMISSION (IBWC) WEBSITE: www.ibwc.state.gov

IBWC CONTACT: SALLY SPENER, 915/ 832-4175 or email: sallyspener@ibwc.state.gov

WATER BRIEFS

INTERSTATE WATER QUALITY: COALBED METHANE CONFLICT MT/WY

The interstate conflict that has arisen between Wyoming and Montana concerning implementation of Montana's water quality standards is heating up (Water Briefs, TWR #26). The Governor of Wyoming has weighed in on Montana's new nondegradation rules by sending a letter on April 5 to the Administrator of the EPA, Stephen Johnson, asserting that EPA should reject the rules, but calling for the federal agency to mediate the interstate dispute. A week later, Governor Dave Freudenthal appointed a new task force in Wyoming charged with evaluating possible uses of water produced by coalbed methane operations.

Governor Freudenthal's letter of April 5 to EPA asserts that Montana's proposed rules "are not grounded in sound science and...they could visit serious economic harm to Wyoming." The state of Wyoming and counties collect about \$380,000 per day in severance and ad valorem taxes and royalties on CBM production. The Governor stated "Montana's attempt to control Wyoming waters in the absence of any demonstrated impact on Montana waters plainly violates section 510 of the Clean Water Act, 33 U.S.C. 1370. Section 510 prohibits regulation in derogation of a state's jurisdiction over waters within its borders." He also asserts that implementation of the rules "would unconstitutionally infringe upon Wyoming's sovereignty and would violate the commerce clause of the Constitution." Rather than simply rejecting the rules, however, the Governor's letter requests that "given the magnitude of this impending dispute" EPA should suspend its review of the rules and mediate the dispute between the states. The letter then requests that Wyoming be allowed to file a statement of its position and that a formal public hearing be held before the mediator renders an advisory opinion.

In making his argument that EPA should step in to mediate the dispute, Governor Freudenthal's letter noted a 1983 EPA statement concerning its intent to take an active role in resolving water quality-related disputes between two states, then referred specifically to EPA actions involving disputes between an Indian Tribe and a state. "EPA reaffirmed its 1983 position on interstate dispute resolution authority [see 48 Fed. Reg. 51400, 51413 (Nov. 8, 1983)] in two subsequent rulemakings on procedures, set forth in 40 C.F.R. 131.7, for resolving disputes that arise between an Indian Tribe that has state-equivalent status and a state over their respective water quality standards for common bodies of water. See 56 Fed. Reg. 64876, 64888 (Dec. 12, 1991); 59 Fed. Reg. 64339, 64342 (Dec. 14, 1994). In both rulemakings, EPA declined to revise the rule to expand its coverage to state vs. state disputes because EPA already has the authority to resolve disputes between states arising out of state water quality standards. EPA expressly cited its 1983 interpretation of that authority in 1991 and reiterated that citation in 1994. See 56 Fed. Reg. at 64889; 59 Fed. Reg. at 64342."

Although EPA has not yet taken a position on Montana's new rules, the federal Department of Energy is reportedly backing Wyoming's attempt to block implementation of the rules. Meanwhile, Montana officials relied, at least in part, on a 2003 EPA draft study that concluded that requiring companies to hold the contaminated water in storage ponds "would not have a major impact on production or any of the financial parameters measured by the economic model of any of the geographic regions investigated [Wyoming, Montana or Indian Country]."

Montana's new rules of March 23, 2006 (amendment of ARM 17.30.670 and 17.30.1202) pertain to nondegradation requirements for electrical conductivity (EC) and sodium adsorption ratio (SAR), definitions for technology-based effluent limitations, and the adoption of new rules I through X pertaining to minimum technology-based controls and treatment requirements for the coalbed methane industry.

Other proposed limitations were rejected by the Montana Board of Environmental Review (see "Summary of March 23rd Board Action" on the Montana DEQ website).

For info: Art Compton, MDEQ Planning, 406/ 444-6754; MDEQ website: www.deq.mt.gov/CoalBedMethane; Wyoming Governor's website: http://wyoming.gov/governor/press_releases/2006/april%2006/cbm.asp

NPDES AUTHORITY CHALLENGED WA

STORMWATER & POINT SOURCES

A group of local and national organizations sent a Notice of Intent to Sue on April 19 to the US Environmental Protection Agency (EPA) concerning the agency's failure to fulfill its duties under the federal Endangered Species Act (ESA) to address the harmful effects of point source water pollution on the threatened Puget Sound Chinook. The group, lead by the National Wildlife Federation (NWF) and including Public Employees for Environmental Responsibility, People For Puget Sound, Puget Soundkeeper Alliance, and Washington Trout, contends that EPA has failed to consider the harmful effects of discharged pollutants and stormwater on Chinook salmon due to its inadequate oversight of the State of Washington's National Pollution Discharge Elimination System (NPDES) permit program.

The NOI alleges that "EPA has failed to fulfill Section 7 consultation duties with respect to the delegation of the National Pollutant Discharge Elimination System permit program to the State of Washington, and continuing oversight and funding of that program with respect to the effects of that program on threatened Puget Sound Chinook and its designated critical habitat." The suit will be filed under section 11(g) of the ESA, 16 U.S.C. § 1540(g), and will seek to enjoin EPA from violating the ESA, as well as other available relief.

Richard A. Smith of Smith & Lowney (Seattle) told The Water Report that this case has significant differences from the 9th Circuit's decision of August 22, which vacated Arizona's NPDES authority (see Light, TWR #25 and Water Briefs, TWR #19). In the Arizona case "there was a consultation going on in Arizona because the NPDES program there was new. Our case is about the failure to consult by EPA when the delegation of NPDES authority occurred some years ago, plus EPA's continuing oversight and funding of that program." Smith went on to note that the Notice of Intent to Sue (NOI) filed on April 19 is "not an ordinary notice letter. It is approximately 30 pages long and goes into great detail regarding how the program doesn't adequately protect fish." Smith also said that a "thick batch of attachments" was included with the NOI, documenting the allegations made.

The NOI references the Memorandum of Agreement (MOA) governing the delegation of NPDES authority by EPA to the state of Washington (executed on January 9, 1990). "The agreement states that 'EPA will oversee the administration of NPDES on a continuous basis for consistency with the CWA, this Agreement, the annual program plan, and *all applicable federal regulations and policies*.'" (emphasis added in NOI, pages 9-10).

Specific problems with Washington's NPDES program were set forth in significant detail in the NOI. Municipal stormwater problems were noted, as well as stormwater from industrial activities (including the Industrial Stormwater General Permit, the Construction Stormwater General Permit, and the Boatyard General Permit). The NOI also specifically mentions "Toxic Pollutant Discharges." As part of that section of the NOI, the letter states that a regulatory problem worthy of additional discussion is the Department of Ecology's (Ecology's) "policy and practice of using 'mixing zones' to allow and justify elevated levels of toxic pollution and, often, to avoid imposing numeric effluent limitations to control levels of toxic pollutants in permitted discharges. Out of its concern for impacts on ESA-listed fish and designated critical habitat resulting from this policy and practice, NMFS has called for the development of 'a regional mixing zone policy' 'to minimize take from NPDES permitting on listed fish throughout the region...' (NOI at 26). According to the NOI, "The use of mixing zones is inappropriate with respect to toxic pollutants in general and to persistent bioaccumulative toxic pollutants in particular." (NOI at 27).

While noting that the NOI does not provide an "exhaustive description of the ways in which the program affects these threatened fish and their critical habitat," the NOI goes on to list several other issues, such as "lengthy 'compliance schedules' for attainment of water quality-based effluent limitations, the failure to adequately regulate pollutants that may be harmful to salmonids but for which there are no established water quality criteria, the failure to timely reissue permits at the expiration of their five-year terms to incorporate improved knowledge and technology, the failure to include monitoring requirements sufficient to determine whether authorized discharges cause or contribute to violations of water quality standards, failure to adequately regulate discharges from concentrated animal feeding operations, the failure to substantively and temporally limit grants of short-term water quality modifications in aquatic pesticide application permits as required by the state water quality standards regulation, and the refusal to extend NPDES regulation to some categories of discharges, including discharges from sites regulated under the Model Toxics Control Act and discharges via direct hydrologic connection." (NOI, page 29).

The NWF press release stated that the group is relying on a recent technical report commissioned to analyze the impacts of stormwater and toxics on Puget Sound Chinook salmon and its habitat. That report concluded that continued degradation of water quality by discharged pollutants and runoff will impair regional efforts to recover imperiled Chinook salmon (see report at www.peer.org/docs/wa/06_19_6_report.pdf).

NWF maintains that in Washington, pollution discharge permits for stormwater are generally ineffective in ensuring that stormwater discharges do not contribute to violations of water quality standards, even though the largest source of pollution harming Puget Sound is stormwater runoff. NWF's press release further explained the reasons for the NOI: "Untreated stormwater is unsafe because it includes toxic organics, heavy metals, bacteria, viruses, nutrients, oil and grease, pesticides and herbicides, and suspended solids - all of which are harmful to salmon. Stormwater runoff from urbanized areas has severe effects on stream hydrology, making rivers and creeks less suitable for salmon spawning and rearing. Industrial and municipal

NPDES AUTHORITY CHALLENGED (CONTINUED)

sewage plant discharges often contain elevated levels of toxic pollutants and are of concern as well.”

The groups are asking that EPA immediately initiate formal consultation with the National Marine Fisheries Service (NMFS) on the effects of permitted pollutant discharges on Puget Sound Chinook salmon. “It is essential that scientists with expertise in the impact of toxic pollutants evaluate the impact of EPA approved pollution on endangered salmon and orca whales,” said Sue Joerger, Executive Director of the Puget Soundkeeper Alliance. “It is appalling that regulators have not consulted with scientists prior to allowing toxics to be discharged in critical salmon habitat.”

EPA has 60 days from April 19 to respond. After 60 days have passed, the environmental coalition can file a lawsuit in federal court. The NOI does not name either the Department of Ecology or Washington State.

For info: Richard A. Smith, 206/ 860-2883; James Schroeder, National Wildlife Federation, 206/ 285-8707; Kathy Fletcher, People For Puget Sound, 206/ 382-7007; Kurt Beardslee, Washington Trout, 425/ 788-1167

NATIVE & NON-NATIVE FISH WEST

USGS FINDS ONE-IN-FOUR FISHES NON-NATIVE IN TWELVE WESTERN STATES

FINDINGS MAY INFLUENCE NEW HABITAT ACTION PLAN

One of every four fishes in streams of 12 western states is non-native, according to a USGS study published in November 2005 in the North American Journal of Fisheries Management. Researchers found that not only were there are a lot of non-native fishes but they are also widespread – flourishing in half of the streams in these states in pristine as well as highly disturbed habitats.

To reach their conclusions, study authors Charles Schade, University of Arizona, and Scott Bonar, a USGS researcher at the Arizona Cooperative Fish and Wildlife Research Unit at the University of Arizona, reviewed Environmental Protection Agency (EPA) data from one of the largest standardized stream surveys ever conducted in the western United States. The survey covered nearly 404,000 miles of streams in Arizona, California, Colorado, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, Washington and Wyoming.

The results of this study are especially relevant in light a recent announcement of a fish-habitat restoration partnership of federal, state, and local agencies, conservation groups, angling industries, and academia. In April, federal officials announced a new partnership that brings together the USGS, Fish and Wildlife Service, National Oceanic and Atmospheric Administration, state agencies and sportfishing and conservation groups to collaborate on fish-habitat restoration plans around the country. The National Fish Habitat Action Plan calls for officials to “protect all healthy and intact fish habitats” by 2015 and improve the condition of 90 percent of priority habitats and species by 2020. About 40 percent of all freshwater fish species in the country are at risk of extinction, according the Fish and Wildlife Service.

Study author Bonar said that non-native fishes were most common in streams of the interior states of Arizona, Colorado, Nevada, Utah, and Montana. In Arizona, Colorado, Montana, North Dakota, South Dakota and Utah, non-native fishes were found in more than 50 percent of all streams surveyed. In Colorado, in fact, two of every three fishes were non-native, followed by Arizona, where one of every two fish was non-native. In North Dakota, however, only 1-in-12 fish was non-native.

In about 11 percent of streams in all the states, said Bonar, all fishes were non-native. He also noted that native fishes solely inhabited about 50 percent of streams — mostly in forested areas.

One of the more surprising findings of the study was that researchers generally found that there were more non-native fish than native fish in less disturbed streams, although non-native fishes were also quite common in the most disturbed streams. “Basically,” said Bonar, “non-native fishes were found across the landscape in all habitat types, though streams in forested areas were less likely to contain non-native fish. Our data suggest that no matter how pristine the habitat type, there exists a non-native species that can colonize it.”

The study found that non-native fish were present in a much greater proportion of western streams (50 percent) than those scored by the EPA as affected by moderate to high levels of human impact (18 percent). “Without deemphasizing the importance of landscape disturbance by humans, we concluded that non-native fishes pose an equivalent, if not greater, threat to native fishes than habitat degradation in western US streams,” Bonar said. “Consequently, attention to both habitat degradation and the non-native species problem is important to effectively restore streams of the American West.”

Bonar noted that the most common non-native fishes in western US streams – such as brook, brown, cutthroat and rainbow trout; smallmouth and largemouth bass; mosquitofish; golden shiner; and common carp — were introduced for sport, food, fish forage, mosquito control, and bait.

For info: Scott Bonar, U of AZ, 520/ 621-1959 or email: sbonar@ag.arizona.edu; Stephanie Hanna, USGS, 206/ 331-0335 or email: shanna@usgs.gov

VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER & DRINKING WATER WELLS

The US Geological Survey (USGS) recently released a report describing the occurrence of volatile organic compounds (VOCs) in groundwater and drinking water supply wells across the Nation. VOCs are produced in large volumes and are associated with a myriad of products, such as plastics, adhesives, paints, gasoline, fumigants, refrigerants, and dry-cleaning fluids. The report concludes that VOCs were detected in aquifers across the Nation and not limited to just a few specific aquifers or regions. Despite the nationwide occurrence, VOCs were not detected in most of the sampled wells (about 80 percent had no detections above a threshold of 0.2 part per billion). VOCs were detected in some domestic and public-supply wells, but seldom at concentrations greater than US Environmental Protection Agency (EPA) regulatory or USGS health-based guidelines.

Dr. Robert Hirsch, Associate Director for Water, said, "VOCs are an important group of environmental contaminants to monitor and manage in groundwater because of their widespread and long-term use. Once released, VOCs tend to persist in the environment and migrate in groundwater, potentially to drinking water supply wells. Some VOCs are of concern because of their potential carcinogenicity or other health effects, and because they can change the taste and odor of drinking water." Hirsch also commented that "the USGS assessment provides the most comprehensive national-scale analysis to date of VOC occurrence in aquifers used as an important supply of drinking water."

The USGS report is based on analysis of groundwater samples from nearly 3,500 wells which are distributed randomly across broad regions and represent 98 aquifer studies across the Nation—from Florida to the Pacific Northwest, plus a regional study in the High Plains aquifer system. Most of the wells were sampled between 1985 and 2002. The study characterized large-scale resource occurrence of VOCs, and was not designed to evaluate localized VOC contamination of groundwater, such as at landfills and leaking underground storage tanks. The report also presents a USGS analysis focused only on drinking water supply wells, including more than 2,400 domestic and nearly 1,100 public wells.

Although the USGS study did not analyze drinking water after treatment, the results from drinking water supply wells were compared to federal drinking water standards and other human-health based benchmarks as an initial screening-level assessment. According to senior author John Zogorski, "VOCs were detected in drinking water supply wells—specifically, in 14 percent of domestic wells and 26 percent of public wells, but only a small number of samples (less than 2 percent) had VOC concentrations that were greater than federal drinking water standards. Concentrations greater than standards were accounted for by eight compounds, in large part by the solvents perchloroethene (PCE) and trichloroethene (TCE), and the agricultural fumigant dibromochloropropane (DBCP)."

Zogorski also explained that "VOCs were detected more frequently in public wells than in domestic wells. It is likely that the higher rate of detection of VOCs in public wells is a result of their larger withdrawal rates and their proximity to developed areas." USGS findings suggest strong relations between VOCs in groundwater and percentage of urban land use within a half-kilometer radius of sampled wells. Zogorski added that "It is likely that urban areas have more sources of VOCs compared to other land-use settings. Source-water protection programs are critical for the effective management of VOC contamination, particularly for urban wells."

The report provides a detailed examination of which VOC compounds occur most frequently in groundwater and general patterns and associations explaining where they may be found. VOCs were detected in 90 of 98 aquifer studies completed across the Nation. In general, detections of most VOC compounds were distributed across the Nation; a few VOCs, such as the gasoline oxygenate methyl tert-butyl ether (MTBE) and soil fumigants, were found in a few distinct regions.

Many of the aquifer samples had low concentrations of VOCs—defined in the report as less than one part per billion. The prevalence of VOCs at low concentrations indicates the need for groundwater managers and policy makers to continue to manage and monitor the occurrence of these contaminants over the long term. Each VOC has a unique pattern of occurrence depending on many factors related to its sources and to its persistence and transport in aquifers. The most frequently detected VOCs were chloroform, the solvents PCE and TCE, and MTBE. Thirteen VOCs were not detected at all.

An important source of chloroform appears related to the recycling of treated water that had been chlorinated or perhaps water exposed to household products that contain chlorine (e.g. bleach). Artificial recharge of water and wastewater containing chloroform, most likely resulting from water chlorination, is an increasingly common practice, particularly in the West.

MTBE is an oxygenate added to gasoline to improve combustion and reduce air pollution. MTBE has been intensively used in reformulated gasoline for only about 10 years, but its relatively high mobility and persistence has allowed it to reach groundwater, particularly in areas of high use in New England and Mid-Atlantic States. In 2005, federal legislation eliminated the oxygen requirement in gasoline, which is expected to decrease the use of MTBE in gasoline in the future.

PCE and TCE are organic compounds containing chlorine and are most often used as solvents in a variety of industrial, commercial, and domestic applications. For example, PCE is used as a dry cleaning solvent by most commercial dry cleaners. Production of PCE and TCE has been declining since the 1970s; monitoring over the long-term will help to track any changes in their concentrations in groundwater.

The report, "*Volatile Organic Compounds in the Nation's Groundwater and Drinking Water Supply Wells*" Circular 1292 is available at http://water.usgs.gov/nawqa/vocs/national_assessment, or by calling 1-888-ASK-USGS, or by fax 303/ 202-4693.

For info: John Zogorski, USGS, 605/ 394-3214 or email: jszogors@usgs.gov; Donna Myers, USGS, 703/ 648-5012 or email: dnmyers@usgs.gov

WATER BRIEFS

**AAMODT SETTLEMENT NM
WATER RIGHTS ADJUDICATION**

A settlement agreement signed May 3 resolves one of the longest running water rights cases in New Mexico's history. The Aamodt Settlement — between the Nambe, Tesuque, Pojoaque, San Ildefonso Pueblos, non-Pueblo parties, and the State of New Mexico — resolves claims of the Pueblos and non-Pueblo parties' use of waters of the Nambe-Pojoaque-Tesuque Basin.

The settlement is complex and uses many key concepts. The Pueblos agree to not make "priority calls" against non-Pueblo users provided the non-Pueblo users agree to one of several options outlined in the settlement. A regional water system (pipeline) will be constructed to deliver treated water to Pueblo and non-Pueblo users in the basin. Connecting to the pipeline is optional. The US will acquire 2,500 acre-feet of imported water per year in the basin for use by the Pueblos to compensate them for not fully exercising their rights to call priority. Santa Fe County would be responsible for acquiring 750 acre-feet per year of imported water for the benefit of non-Pueblo users, and for a total supply of 1,500 acre-feet per year for use by non-Pueblo water users in the basin. The settlement agreement and supporting documents are available at the Office of the State Engineer's website below.

To be completely finalized, draft legislation will be submitted to the US Congress for approval and authorization of the settlement project. Once the legislation is passed it will then be necessary to secure the funding to fully implement the agreement. The settlement agreement requires that the completion of non-Pueblo adjudication and the partial final decree be entered by the court in the Aamodt case by December 15, 2012.

For info: Karin Stangl, Office of the State Engineer/Interstate Stream Commission, 505/ 827-6139; OSE website: www.ose.state.nm.us (Hot Topics >>Aamodt Information)

**GW CONTAMINATION NE
\$7.3 MILLION EPA SETTLEMENT**

EPA has reached a settlement with Desco Corporation and Dravo Corporation resolving claims for past response costs incurred by EPA and DOJ at the Colorado Avenue Subsite of the Hastings Ground Water Contamination Superfund Site. According to a Consent Decree lodged in the US District Court for Nebraska on March 31, 2006, the two settling parties will pay EPA \$7.3 million to settle past cost liability and will perform interim remedial actions for groundwater and source control operable units (OU1 and OU9) within the Subsite.

The Colorado Avenue Subsite is located in the city of Hastings, population 24,000. Contamination of groundwater and soil is characterized by industrial solvents that were allegedly released into storm and sanitary sewers from the industrial site. Constituents of concern include trichloroethylene (TCE), 1,1,1-trichloroethane (TCA), and tetrachloroethene (PCE). From the 1960's through 2000, Dravo and then Desco operated manufacturing facilities at this address, each for approximately 20 years. Both companies used the solvents containing TCE and TCA in a vapor degreaser to clean equipment. PCE may have been a contaminant in TCE. EPA has been overseeing work performed by Dravo and Desco under unilateral orders to control the source of the contamination and contain the spread of the groundwater contamination plume. EPA is addressing the groundwater contamination that has migrated beyond the in-well aeration treatment systems installed in 2001 under the terms of the 1993 unilateral order.

The Hastings Ground Water Contamination Superfund site was added to the National Priority List in 1986, three years after the state began investigating drinking water quality complaints by Hastings residents. As a result of the initial investigations, four municipal drinking water wells and two privately owned public supply wells east of town were shutdown. While the water provided by the City is safe for drinking, private wells located outside of the city used for human and livestock drinking water and crop irrigation may continue

to be affected by contamination from sources inside the City. The complexity and extent of contamination at the Hastings Site has resulted in the designation of seven distinct subsites, which correspond to the major sources of contamination. Contamination sources outside of the Colorado Avenue Subsite include two closed municipal landfills, a former grain elevator operation, an industrial source upgradient of the Colorado Avenue Subsite, and a closed Naval Ammunition Depot east of the City. **For info:** Audrey Asher, EPA Region 7, email: asher.audrey@epa.gov

**SHASTA LAKE OPTIONS CA
SCOPING REPORT AVAILABLE**

The US Bureau of Reclamation has made available the Public Scoping Report for Shasta Lake Water Resources Investigation (SLWRI). This report provides information on the SLWRI and discusses the scoping process and public participation. Reclamation, the lead Federal agency, will prepare a Feasibility Report/ Environmental Impact Statement (FR/ EIS) for the SLWRI.

The environmental document will focus on assessing the environmental impacts of the alternatives that include a dam raise between 6.5 and 18.5 feet. The Draft FR/EIS is expected to be available December 2007.

Alternatives will be formulated to address the primary study objectives: 1) increase the restoration of anadromous fish populations in the Sacramento River primarily upstream of the Red Bluff Diversion Dam; and 2) increase water supplies and water supply reliability for agricultural, municipal and industrial, and environmental purposes to help meet future water demands, with a focus on enlarging Shasta Dam and Reservoir.

Public participation will continue through the completion date of the SLWRI FR/EIS scheduled for fall 2008. The Public Scoping Report is available online: www.usbr.gov/mp/slwri/documents.html

For info: Ms. Sammie Cervantes, Reclamation, 916/ 978-5189 or email: scervantes@mp.usbr.gov

**RIO GRANDE OPERATION SW
ANNUAL OPERATING PLAN**

In April, Reclamation's Albuquerque Area Office and the US Army Corps released their Annual Operating Plan (AOP) for the Rio Grande. The agencies expect to have sufficient supplies available for the irrigation season and to meet the flow requirements mandated in the Biological Opinion that aid in the recovery of the Rio Grande silvery minnow. However, they expect to fully use supplemental water supplies. The Middle Rio Grande Conservancy District expects to have a full irrigation season.

The state again entered Article VII restrictions under the Rio Grande Compact. The compact restricts storage of water in reservoirs above Elephant Butte that were built after 1929 including El Vado Reservoir when the combined level of usable project storage water in Elephant Butte and Caballo reservoirs falls below 400,000 acre-feet. Reclamation expects to remain under the Article VII restrictions through the summer.

The April forecast data released by the Natural Resources Conservation Service showed snow pack levels throughout northern New Mexico to be below average. The inflow at El Vado Reservoir was expected to be about 91,000 AF or 38 percent of average. The inflow at Heron Reservoir was expected to be about 58,000 AF or about 44 percent of average.

For info: Mary Perea Carlson, Reclamation, 505/ 462-3576; Bruce Hill, Army Corps, 505/ 342-3171

**INTERSTATE CONFLICT OK/AR
OKLAHOMA WATER QUALITY**

On April 3, Oklahoma's Attorney General (AG) Drew Edmondson asked a federal judge to toss out poultry companies' claims against more than one hundred Oklahoma landowners, businesses and municipalities. Oklahoma filed a federal lawsuit against several Arkansas poultry companies in June 2005, accusing the companies of releasing hazardous substances and other pollutants into the Illinois River watershed and Lake

Tenkiller (see Water Briefs, TWR #20). According to AG Edmondson, poultry companies filed claims naming 160 Oklahoma citizens, businesses and cities as third-party defendants in the suit in an effort to shift the blame to others in the watershed. These same companies also filed a single claim naming 150 unidentified "John and Jane Does."

AG Edmondson filed a motion asking the US District Court for the Northern District of Oklahoma to strike or, in the alternative, sever and stay the claims against these unsuspecting targets of the poultry companies' "anyone-but-me" tactics. "The companies' argument is this - if we are polluting so are these folks," Edmondson said. "The companies are playing a game of political chicken on shaky legal ground." The AG is also requesting that people named by the poultry companies be excused from responding to the companies' claims until the court rules on the state's request to strike them. "We are hopeful that the people who were dragged into this lawsuit by the companies will be allowed to hold off on responding until we know if the court will dismiss them from the case," Edmondson said. "We asked the companies to agree to this request, but they declined."

The AG called the companies' claims against these Oklahomans political hostage taking, stating, "About half of the Illinois River watershed is in Arkansas but the poultry companies did not name a single Arkansas entity."

According to the AG, the amount of phosphorus from poultry waste the companies dump every year in the Illinois River watershed is estimated as equal to the waste of 10.7 million people — more than the populations of Oklahoma, Kansas and Arkansas combined. The motions to stay and strike are available on the AG's website. **For info:** AG's Office, 405/ 521-3921, or website: www.oag.state.ok.us/ (press releases >> 4/3/06 news release)

**SEDIMENTS CLEANUP NY/NJ
TWO EXPERIMENTAL PROCESSES**

EPA Region 2 and the New Jersey DOT's Office of Maritime Resources are finding new ways to decontaminate

dredged material from the Port of New York and New Jersey. EPA recently demonstrated the Biogenesis Sediment Washing Technology at a commercial-scale class B recycling facility in Woodbridge, NJ. This process demonstrates the commercial feasibility of turning contaminated sediment into beneficial products like manufactured soil. The technology entails washing contaminants like PCBs, heavy metals, and PAHs from fine silt/clay sediments particles through a five-step treatment system that involves using high-pressure water and a biodegradable detergent.

Another technology is being tested in Bayonne, NJ. The Cement-Lock process, patented by Endesco, heats contaminated sediment to 1400 degrees centigrade to destroy organic contaminants then cools the molten material quickly to trap inorganic pollutants. This process creates a glass-like material that is mixed into cement. In addition to determining the efficiency of the process, EPA and its partners must determine if plant emissions are acceptable.

Highly contaminated sediment dredged from the harbors cannot be placed offshore in the ocean. Also, the cost of treating dredged material makes it necessary to find new technologies that lead to commercially viable beneficial uses, like construction grade cement or composite bricks.

The research for these two technologies as well as up to 12 other innovative processes that have been tested under a bench – pilot – and full-scale testing program began in 1994. Other technical support/partners in this program include the Department of Energy's Brookhaven National Laboratory, Rutgers University, and Montclair State University. In addition to treating highly contaminated sediment dredged from contaminated aquatic Superfund Sites, these technologies can be used to address contaminated sediment dredged by the US Army Corps to maintain navigational channels.

For info: Eric Stern, EPA Region 2, 212/ 637-3806

WATER BRIEFS

**CONDEMNATION CASE WA
WATER RIGHTS TRANSFER**

The cities of Olympia, Lacey and Tumwater have reached a tentative settlement with the owner of the former Olympia brewery to purchase water rights for \$12.3 million, with that price dependent on the amount of rights historically used. Included in the agreement is a provision to supply up to half of the water back to the brewery's new owner, All American Bottled Water Corp. (All American), for future use.

The city of Olympia had moved to condemn the dormant water rights in February, utilizing a little-used authority in Washington law (Water Briefs, TWR #25). Tumwater and Lacey later joined Olympia's eminent domain filing as co-petitioners after initially being caught off guard by Olympia's move. The cities also came to an agreement that they would equally share any water rights obtained through the condemnation proceeding and that the costs of such proceeding would be similarly shared.

The cities will become the owners of all the water rights and pay \$1,750 per acre-foot for those rights. Transfer approval must be received from the Washington Department of Ecology (Ecology) to change the purpose of use from industrial to municipal use. According to Ecology's records, the water rights total over 7,000 acre-feet of water, meaning the total price could be as high as \$12.3 million. The price will be reduced if Ecology determines that the historic use of the water rights was for some lesser amount.

Jim Greenfield of the Davis Wright Tremaine law firm in Seattle, who represents All American, discussed the "unusual situation" with The Water Report. "From All American's perspective, this was an unfortunate and difficult bump in the road on the way to converting the facility to a water bottling plant." As far as the amount of water rights that will ultimately be transferred to the cities, Greenfield said that "the truth is we don't know exactly what the historic use was and we don't know what the status of the water rights will

actually wind up being. All four parties [three cities and All American] have an interest in maximizing the water rights transferred and will be working together to prevent any relinquishment of the rights [due to non-use]." The transfer process before Ecology "is a volatile and uncertain process" especially where, as here, the water rights are being converted from industrial use to municipal uses, Greenfield noted.

All American's future water use is the subject of a separate agreement. Under that deal, the cities agreed to provide All American with half of the water rights obtained, up to a maximum of 1.8 million gallons per day, for 99 years. All American is obligated to pay \$10 per year, plus payments for a fair share of operations, maintenance, repair, testing and treatment costs to supply the water. If, however, All American does not use that water for three consecutive years, all of the water rights would revert to the cities. When Olympia's city council voted on the agreement on April 26, they revised it to include a clarification that All American cannot satisfy the "use" clause simply by turning on a faucet, but must use the water for water- or beverage-bottling operations or the cities can claim All American's share. All American's rights under the Water Supply Agreement may be freely assigned or transferred to another party provided that the water is used for a water or beverage bottling plant at the former brewery.

For info: Settlement Agreement and Water Supply Agreement on City of Olympia's website: http://olympia.granicus.com/MetaViewer.php?view_id=2&clip_id=58&meta_id=6195

**UIC FINE CA
FAILURE TO MONITOR-REPORT**

On April 24, EPA proposed a fine of \$62,758 against SMS Briners Inc. of Stockton, Calif. for failing to monitor and report activities required by its underground injection well permit under the federal Safe Drinking Water Act. According to EPA, SMS Briners failed to conduct injected fluid analysis, record tubing-casing annular pressure, and submit two quarterly reports from December 2000 to March 2002, as

required under its federal permit. The proposed settlement is subject to a 30-day public review and comment period ending May 24.

SMS Briners owns and operates a vegetable brining facility in Stockton, where it injects an average of 97 gallons a minute of non-hazardous brine waste into an underground well approximately 3,300 feet below the surface. The facility has since provided the reports, and is working with the EPA to ensure continued compliance with its underground injection permit. "Timely and accurate monitoring to ensure the injected wastewater does not compromise the aquifer is a vital component of our requirements," said Alexis Strauss, director of the Water Division in the Pacific Southwest region. "Underground injection of wastewater can be an effective means of disposal, but only if the facility complies with the proper requirements laid out in the permit."

For info: Lisa Fasano, EPA, 415/ 947-4307, or EPA website: www.epa.gov/region09/water/drinking/dw-enforcement.html

**HYDRO RELICENSING OR/CA
FISH PASSAGE TRANSPORT**

Responding to preliminary fishway prescriptions for the relicensing of the Klamath Hydroelectric Project on the Klamath River submitted by NOAA Fisheries (see Water Briefs, TWR #26), PacifiCorp responded on April 28 with its proposal to trap-and-transport fish to provide fish passage past the series of dams. PacifiCorp made its recommendations under new licensing provisions passed into law with the Energy Policy Act of 2005 (see Water Briefs, TWR #22 and #23 regarding the new process).

PacifiCorp will work through details of the proposal with stakeholder groups within the settlement process in the coming months. That process is underway on a parallel track with the Federal Energy Regulatory Commission's relicensing process (FERC #2082). "Klamath Basin natural resource issues

WATER BRIEFS

are complex,” said PacifiCorp Energy’s president Bill Fehrman. “We believe that the settlement process offers the best chance for a comprehensive outcome for resolving resource and other issues on the Klamath River.”

In its filing, PacifiCorp calls for a trap-and-transport facility and downstream collectors to test the feasibility of reintroducing salmon to the upper Klamath Basin. The proposal differs radically from the prescriptions offered by federal fishery agencies in late March, but PacifiCorp says it is seeking to find a viable way to reintroduce fish into suitable habitats using a science-based approach. No estimate was made by PacifiCorp regarding the cost of its proposal; the fish passage requirements submitted by NOAA Fisheries were estimated to cost as much as \$200 million to screen turbines and build fish ladders.

In a related action, the California Public Utility Commission (CPUC) voted unanimously on April 13 to allow PacifiCorp to raise electricity rates over the next four years for irrigators in the Klamath Basin, thereby phasing out preferential agricultural rates that had been in place for the last 100 years (see CPUC website for decision on U 901-E: www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/55443.htm). On April 12, the Oregon Public Utility Commission (OPUC) also agreed to rate increases ending the preferential agricultural rates and decided to implement an Oregon state law that spreads PacifiCorp’s increases for irrigators on the Oregon side of the border over the next seven years. UE 170, Order No. 06-172 (4/12/06) at OPUC’s website: <http://apps.puc.state.or.us/edockets/docket.asp?DocketID=11708> (see also Water Briefs, TWR #20).

For info: PacifiCorp’s website: www.pacificorp.com/Article/Article1152.html

NAVAJO RESERVOIR FEIS NM FINAL FEIS AVAILABLE

On April 20, Reclamation’s Western Colorado Area Office announced the release of the Navajo Reservoir Operations Final Environmental Impact Statement (FEIS). The FEIS provides an analysis of operating Navajo Reservoir to implement the flow recommendations provided by the San Juan River Basin Recovery Implementation Program. The purpose of this action is to provide sufficient releases of water at times, quantities, and durations necessary to conserve, in concert with other authorized recovery actions, two endangered fish species and their designated critical habitat in the San Juan River downstream from Farmington, New Mexico.

Reclamation will maintain the authorized purposes of the Navajo Unit which include enabling future water development to proceed in the San Juan River Basin in compliance with applicable laws, compacts, court decrees, and Indian trust responsibilities.

No decision will be made on the proposed federal action until 30 days after release of the FEIS. After the 30-day waiting period, Reclamation will complete a Record of Decision (ROD). The ROD will state the action that will be implemented and discuss all factors leading to that decision.

Copies of the FEIS are available from Reclamation’s website: www.usbr.gov/uc/envdocs/eis/navajo/navresops_Feis.html

For info: Pat Page, Reclamation, 970/385-6500 or email: ppage@uc.usbr.gov

HANFORD SITE WA CERCLA REVIEW - PUBLIC COMMENT

The US Department of Energy (USDOE) is preparing the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 5-Year Review Report for the Hanford Superfund site in Washington state (see Niles, TWR #23). CERCLA 5-Year Reviews evaluate completed cleanup actions in areas where hazardous substances, pollutants, or contaminants remain or will remain above levels that allow for unlimited use and unrestricted

exposure. The first Five-Year Review Report was completed in 2001.

The review evaluates the effectiveness of the cleanup actions and whether or not they are protective of human health and the environment. The report will document the evaluation of whether the selected remedies have, or will accomplish, the objectives established in cleanup Records of Decisions (RODs). Actions to correct deficiencies will be identified.

Review Purposes:

- Evaluate the performance of the selected remedial cleanup actions for waste sites including groundwater in the 100, 200, 300, 1100 Areas and other areas on the Hanford Site to determine whether they are protective of human health and the environment.
- Confirm that immediate threats have been addressed, or where a removal action is in progress that the selected remedy(ies) when complete will be protective of human health and the environment compliant with state and federal laws.
- For sites in the long-term management phase, confirm that the selected remedy is protective and will remain protective for as long as the waste remains hazardous.
- Recommend actions to improve performance when the five-year review indicates that a remedy is not performing as designed.

DOE requests public input on the evaluations of the remedial actions identified in the report. A 30-day public review period will be held May 8 through June 15, 2006. If there is substantial interest in your community, a public meeting may be requested. Public input will be considered before the report is finalized.

For more information on the CERCLA Five Year Report and notes on the first public workshop held to get input on the review, visit the CERCLA webpage: www.hanford.gov/ (select “Public Involvement”).

For info: Cliff Clark, USDOE, 509/376-9333 or email: Cifford_E_Cliff_Clark@rl.gov

Please Note: An extended Calendar containing ongoing updates now appears on The Water Report's website: www.thewaterreport.com. Subscribers are encouraged to submit calendar entries, email: thewaterreport@hotmail.com

May 15-16 AZ

Water Reuse Research 10th Annual Conference: "Advancing the Science of Water Through Research," Phoenix, Hyatt Regency. RE: Water Reuse & Desalination Research Needs & Trends, Waterborne Pathogens, Pharmaceutical Agents, Endocrine Disrupting Compounds, Membrane Applications, Salinity Management & Indirect Potable Reuse. For info: WaterReuse Foundation, 703/ 548-0880, or website: <http://watereuse.org/Foundation/2006conf/index.html>

May 16 OR

Sustainability, Lawyers, and Justice, Portland, Lane Powell Office (601 SW 2nd Avenue, Ste. 2100), 12 am-1:30pm. Sponsored by OSB Environmental & Natural Resources Section. For info: ENR email: shackbart@osbar.org.

May 16-17 CA

2006 NGWA Western Focus Ground Water Conference, San Francisco, Cathedral Hill Hotel. RE: MTBE, Perchlorate Remediation, Legal Implications of Vapor Intrusion & More. For info: NGWA, 800/ 551-7379, or website: www.ngwa.org/e/conf/ 0605165031.cfm#program

May 16-17 CO

Colorado Water Conservation Board Meeting, La Junta. For info: Dena Crist, CWCB, 303/ 866-2599, or website: <http://cwcb.state.co.us/>

May 16-17 OR

Western State Engineers Spring Conference, Portland, Paramount Hotel, 808 SW Taylor Street. RE: Technical Expertise in Water Resources Practices in the Western States. For info: Nicole Charlson, WRD, 503/ 986-0829 or email: nicole.l.charlson@wrdd.state.or.us or WRD website: www.oregon.gov/OWRD/news/event2006.05.16.shtml

May 17-19 WA

Pacific Northwest Section/AWWA Annual Conference, Spokane. For info: NW Section website: www.pnws-awwa.org/conf.cfm

May 18-19 CA

Energy Strategies for Public Agencies, San Francisco, Pan Pacific Hotel. RE: Legal Developments, Regulations, Update FERC/OMOI Enforcement, Power Purchases, Energy Efficiency and Renewables, Financing & More. For info: Law Seminars International, 800/ 854-8009, or website: www.lawseminars.com/

May 18-19 DC

Criminal Enforcement of Environment Laws, Washington, DC. For info: Alexander Hart, American Law Institute-American Bar Association, 800/ 253-6397 or website: www.ali-aba.org/free

May 18-19 AZ

Eminent Domain, Phoenix. For info: CLE Int'l, 800/ 873-7130, email: registrar@cle.com, or website: www.cle.com

May 18-19 OR

Eminent Domain, Portland, The Governor Hotel, 614 SW Eleventh. RE: Condemnation, Valuation & Challenges. For info: The Seminar Group, 800/ 574-4852, email: info@TheSeminarGroup.net, or website: www.TheSeminarGroup.net

May 18-19 TX

Texas Coastal Law, Galveston. For info: CLE Int'l, 800/873-7130, or website: www.cle.com

May 19-21 CO

Polishing Your Groundwater Modeling Skills, Colorado School of the Mines IGWMC Short Course, Golden. RE: Other Short Courses on Modeling & Surface/ Groundwater Flow Systems Available. For info: Mines website: www.mines.edu/igwmc/short-course/

May 21-25 NE

World Environmental & Water Resources Congress, Omaha, Qwest Center and Hilton Omaha. Sponsor: Environmental Water & Resources Institute of the American Society of Civil Engineers. For info: James Dailey, ASCE, 703/ 295-6303, or email: jdailey@asce.org, or website: www.asce.org/conferences/ewri2006/

May 22-24 OR

Deschutes Basin Water Summit, Warm Springs, Kah Nee Ta Resort & Casino. RE: Consensus Building for Water Management Plan. For info: Kathy, Swalley Irrig. Dist., 541/ 388-0658, email: kathy@swalley.com, or website: www.swalley.com

May 22-25 CA

Fifth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey. Sponsored by Battelle. For info: The Conference Group, Inc., 800-783-6338, email: info@confgroupinc.com, or website: www.battelle.org/environment/er/conferences/chlorcon/default.stm

May 24 WA

Model Toxics Control Act, Seattle. For info: Law Seminars International, 800/ 854-8009, or website: www.lawseminars.com/

May 24-26 CO

Modeling Water Flow and Contaminant Transport in Soils and Groundwater, Colorado School of the Mines IGWMC Short Course, Golden. For info: Mines website: www.mines.edu/igwmc/short-course/

May 25 OR

Southern Willamette Valley Groundwater Management Comm. Meeting, Harrisburg, City Council Chambers, 354 Smith Street, 8am-10am. For info: Audrey Eldridge, DEQ Regional Environmental Solutions, 541/ 776-6010 x223

May 31 OR

Hydropower Relicensing Seminar, Portland, World Trade Center. RE: Energy Policy Act, Licensing Processes, Settlement Outcomes, Supreme Court Decisions, ESA & More. For info: The Seminar Group, 800/ 574-4852 or website: www.theseminar.org.net/seminar.lasso?seminar=06.HYDOR

May 31-June 2 CA

Environmental Impact Assessment: NEPA and Related Requirements, San Francisco. For info: ALI-ABA, 800/ 253-6397, or website: www.ali-aba.org

June 1-2 ID

Hanford Advisory Board Meeting, Lewiston. 6/1: 9am-5pm; 6/2: 8:30am-3:30pm. For info: Erik Olds, 509/ 372-8656

June 2 OR

Law of Easements: Legal Issues and Practical Considerations, Portland, Fifth Avenue Suites Hotel. For info: Lorman Education Services, 866/ 352-9539 or website: www.lorman.com

June 4-7 AZ

Western Brownfields Workshop 2006, Tucson. RE: EPA Free Workshop - Register by May 19. For info: EPA Region 10, email: WBWregistration@sra.com; website: www.buildingonbrownfields.com/additional/wbw.pdf

June 4-8 MT

Billings Land Reclamation Symposium, Billings. RE: Change and Innovations in Public Policy, Mining, Reclamation, and Land Management. For info: www.billingslandreclamation.symposium.org

June 5-9 OH

"Nuts and Bolts of Brownfield Redevelopment for Local Government" Training Course, Cleveland. For info: Vivian Tucker, Cleveland State University, 216/ 687-2188, or email: Vivian@urban.csuohio.edu, or website: http://urban.csuohio.edu/nuts_andbolts

June 7-9 CO

Climate Change and the Future of the American West: Exploring the Law and Policy Dimensions, Natural Resources Law Center's Summer Conference (U of C), Boulder. RE: Climate Science, Climate Change, Water Resources & Ecological Systems, Legal & Policy Dimensions. For info: NRLC, email: nrlc@Colorado.edu, or website: www.Colorado.edu/law/centers/nrlc/summerconference/

June 8-9 MT

The Governor's Restoration Forum, Billings, Sheraton Hotel. RE: Restoration & Reclamation of Natural Ecosystems, Federal Commitment to Funding. Held in Association with the Billings Land Reclamation Symposium (6/4-6/8). For info: Governor's website: www.restoration.mt.gov

June 8-9 WA

Global Warming, Seattle, Grand Hyatt Seattle. RE: Science of Global Warming, Adaptation Strategies, Clean Energy Transition, Regulatory Responses, Litigation on Greenhouse Gas Emissions, Corporate Responses & More. For info: The Seminar Group, 800/ 574-4852, email: registrar@theseminar.org.net, or website: www.TheSeminarGroup.net

June 8-9 CA

Eminent Domain, Los Angeles. For info: CLE Int'l, 800/ 873-7130, email: registrar@cle.com, or website: www.cle.com

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June 8-9 UT
Eminent Domain, Salt Lake City.
 For info: CLE Int'l, 800/ 873-7130, email: registrar@cle.com, or website: www.cle.com

June 8-9 WA
Washington Water Law, Seattle,
 Renaissance Seattle Hotel. RE: Ecology's New Priorities, Instream Flow Rule Making, Water Rights Mitigation, Walla Walla Regional Pilot Project, Water Storage & Re-Use in Green Design, Stormwater Resources, PCHB Decisions & Pending Cases, Managing Climate Change, Indian Water Rights & More. For info: Law Seminars International, 800/ 854-8009, or website: www.lawseminars.com/

June 8-9 DC
Wetlands Law and Regulation, Washington D.C. For info: ALI-ABA, 800/ CLE-NEWS, or website: www.ali-aba.org

June 9 UT
NEPA, Salt Lake City. For info: CLE Int'l, 800/873-7130, or website: www.cle.com

June 11-15 TX
ACE 06 - Annual Conference and Exposition, San Antonio, Henry B. Gonzalez Convention Center. For info: American Water Works Association, 800/ 926-7337, or website: www.awwa.org/ace06/

June 14 - 16 FL
Florida Stormwater Association Conference, Ft. Meyers, Sanibel Harbour Resort and Spa. RE: TMDLs & Related Regulatory Topics, Innovations in Best Management Practices, Floodplain Mapping, Hurricane Mitigation & Recovery, MS4 Permitting Requirements. For info: FSA website: www.florida-stormwater.org/conferences/conference2006.htm

June 15-16 WA
Land Use and Environmental Diligence, Seattle. For info: The Seminar Group, 800/ 574-4852, email: registrar@theseminargroup.net, or website: www.TheSeminarGroup.net

June 15-16 CA
Environmental Insurance, San Francisco. For info: ALI-ABA, 800/ CLE-NEWS, or website: www.ali-aba.org

June 19-20 ID
IWUA Summer Water Law Seminar & Workshop, Sun Valley. Sponsored by Idaho Water Users Association. For info: IWUA, 208/ 344-6690, website: www.iwua.org

June 20-21 AZ
"Providing Water to Arizona's Growing Population" - Arizona Water Resources Research Center Spring Conference, Phoenix, Hyatt Regency. For info: Cas Sprout, WRRRC, 602/ 792-9591 x55, or email: csprout@ag.arizona.edu, or website: http://cals.arizona.edu/AZWATER/

June 21-23 WA
Salish Sea Conference, Location TBA. For info: **Debra Lekanof, Swinomish Indian Tribal Community, 360/ 466-7280, email: dlekanof@swinomish.nsn.us** www.salishseaconference.com/index.html

June 21-23 Malta
Waste Management 2006, Malta. Sponsored by Wessex Institute of Technology. For info: WIT website: www.wessex.ac.uk/conferences/2006/waste06/

June 21-24 CO
Environmental Litigation, Boulder. For info: ALI-ABA, 800/ CLE-NEWS, or website: www.ali-aba.org

June 22 WA
Dredging and Sediment Technologies, Seattle. For info: Holly Duncan, Environmental Law Education Center, 503/ 282-5220, email: hduncan@elecenter.com, or website: www.elecenter.com

June 26-28 MT
Adaptive Management of Water Resources: American Water Resources Association Conference, Missoula, Holiday Inn Missoula Parkside. RE: Tools, Monitoring Strategies, Performance Indicators & Target Thresholds, Assessment & Management of Uncertainty, Decision

Support System Applications, Funding Requirements, Collaboration & Role of Social Science, Stakeholder Participation, Conflict Resolution, Socioeconomic Considerations, Legal/ Policy Barriers & More. For info: AWWA, 540/ 687-8390, or website: www.awra.org/meetings/Montana2006/index.html

June 29 WA
Regional Hydropower Relicensing, Seattle, Washington State Convention & Trade Center. RE: Recent Amendments to the Federal Power Act & Related Agency Regulations. For info: The Seminar Group, 800/ 574-4852, email: info@TheSeminarGroup.net, or website: www.TheSeminarGroup.net

July 6-7 IL
4th Annual NGWA International Conference, Chicago, Holiday Inn Chicago Mart Plaza Hotel. RE: Groundwater Law, Environmental Contamination Litigation, Hydrogeology, Contaminant Transport, Groundwater Modeling, Environmental Forensics for Allocating Liability, Toxic Torts, Coalbed Methane, Bottled Water Permitting, Transboundary Water Disputes & Emerging Contaminants. For info: NGWA, 800/ 551-7379, website: www.ngwa.org/e/conf/0607065066.cfm

July 11 WA
Tribal Economies, Seattle. For info: The Seminar Group, 800/ 574-4852, email: registrar@theseminargroup.net, website: www.TheSeminarGroup.net



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