



The Water Report

Water Rights, Water Quality & Water Solutions in the West

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Assistant Secretary
of the Interior
Bennett Raley

Water Valuations

& More!

STORMWATER MANAGEMENT

STATE-OF-THE-ART IN COMPREHENSIVE APPROACHES TO STORMWATER

by Eric Strecker, PE; Marcus Quigley PE; Ben Urbonas, PE; & Jonathan Jones, PE

Introduction

While much has been learned about the performance of stormwater Best Management Practices (BMPs), this information is only rarely used to improve how we actually manage stormwater. Regulatory programs, including the establishment of Total Maximum Daily Loads (TMDLs) under the federal Clean Water Act as well as local design standards, have been slow to respond.

Recently, there has been a growing trend of providing more sustainable and low-impact approaches to development. This trend is encouraging in its ability to improve stormwater quality as well as downstream habitat.

This article challenges some of the traditional thinking about stormwater management and provides some recommendations and guidance to practitioners.

Best Management Practices: What Have We Learned About Their Performance

The US EPA (Environmental Protection Agency)/ASCE (American Society of Civil Engineers) National Stormwater BMP Database has been in development since 1994 under a US EPA grant project with the Urban Water Resources Research Council (UWRRC) of ASCE (Urbonas, 1994).

THE PROJECT WAS INITIATED TO ADDRESS:

- Inconsistent data reporting, which limits scientific comparison/evaluation of studies
- Differences in monitoring strategies and data evaluation methods that result in wide range of reported "effectiveness" (e.g. minus-to-plus percent removals)
- Widespread use of BMPs and faulty BMP performance information without sufficient understanding of performance and factors leading to performance

The project has included: the development of recommended protocols for BMP performance (Urbonas, 1994 and Strecker 1994); a compilation of existing BMP information and "loading" of suitable data into a specially designed database

(www.bmpdatabase.org); and an initial assessment of the results of the analyses of the database (Strecker et. al., 2001). A detailed guidance document on BMP monitoring has also been developed, titled: *Urban Stormwater BMP Performance Monitoring: A Guidance Manual for Meeting the National Stormwater BMP Database Requirements* (download at: www.bmpdatabase.org).

Municipal separate storm sewer system owners ("MS4s") and operators, industries, and transportation agencies need to identify and design effective BMPs for improving stormwater runoff water quality that directly target their "pollutants of concern." The protocols developed under this project and the *Urban Stormwater BMP Performance Monitoring* guidance address the need for improved information by helping to establish a standard basis for collecting water quality, flow, and precipitation data as part of a BMP monitoring program as well as watershed and BMP design information. The collection, storage, and analysis of this data will ultimately improve BMP selection and design.

Major findings of the EPA/ASCE BMP Database effort to date include how to best assess BMP pollutant removal performance for most pollutants (Strecker et. al., 2001).

**Stormwater
BMPs
Assessment**

**“Percent
Removal”**

“HSC”

“LID”

**The Water
Report**

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260 North Polk Street,
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Editors: David Light
& David Moon
Phone: 541/ 343-8504
Cell: 541/ 517-5608
Fax: 541/ 683-8279
email:

thewaterreport@hotmail.com
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BMP POLLUTANT REMOVAL PERFORMANCE IS BEST ASSESSED BY DETERMINING:

- How much stormwater runoff is prevented? (via evapotranspiration and/or infiltration; e.g. Hydrological Source Control)
- How much of the runoff that occurs is or is not treated by the BMP? (amount of flow not by-passed or exceeding BMP effective treatment rates)
- Of the runoff treated, what is the effluent quality? (Statistical characterization of effluent quality)

For some pollutants, the amount of material captured is also important, as well as how the BMP mitigates temperature and/or flow changes.

The most common performance measure used today is “percent removal” of pollutants. The database team has determined that percent removal is a highly problematic method for assessing performance and has resulted in some significant errors in BMP performance reporting (Strecker, et. al., 2001). Percent removals are not recommended as performance descriptors for stormwater BMPs.

An Updated Re-Evaluation of the National BMP Database

The project team has completed an assessment of the recently expanded database. Table 1 presents an overview of the structural BMPs currently in the database, including the number of data records for each structural BMP type. These are studies that meet the protocols established for BMP monitoring and reporting. The almost 200 studies now in the database compares with the total of just over 60 BMP studies in the database during the initial evaluation. New BMP information is being provided to the database team at about a rate of 15-to-30 studies per year. There are currently about 50 studies awaiting entry into the database (subject to funding).

Each study has been analyzed in a consistent manner (described in Strecker, et. al. (2001) & at project website). Data produced includes: lognormal distribution based summary statistics; comparisons of influent and effluent water quality through parametric and non-parametric hypothesis tests; and other summary statistics. The effects of BMPs on hydrology and effluent quality is also being investigated.

Hydrology Evaluation

One of the goals of the database was to provide better information on the effects of BMPs on hydrology and whether some BMPs may have some benefits over others in terms of reducing volumes of runoff (Hydrological Source Control or “HSC”). For example, one would expect that a wet pond might not significantly decrease the volume of runoff, but a biofilter might, given the contact with drier soils and resulting evapotranspiration and/or infiltration. Much of the premise of Low Impact Development (LID) is based upon reducing runoff volumes. Accurately measuring flow during storm conditions is very difficult (EPA, 2002). A field test of over 20 different flow measurement technologies and approaches by the Federal Highway Administration (2001) found that flow measurements of volume of runoff over a storm can be upwards of 50 percent or more off of the expected true flow. Therefore any assessments of the database will likely show some variability in flow changes. However, some trends are evident.

Table 1: Structural BMPs in the International BMP Database

BMP Totals by Category

BMP Category	Number Of BMPs
Structural	
Biofilter (Grass Swales)	32
Detention Basin	24
Hydrodynamic Device	17
Media Filter	30
Percolation Trench/Well	1
Porous Pavement	5
Retention Pond	33
Wetland Basin	15
Wetland Channel	14
Total	171
Non-Structural	
Maintenance Practice	28
Total	28
Grand Total	199

BMP Totals by State/Country

State (Domestic)	Number of BMPs
AL	13
CA	41
CO	4
FL	24
GA	2
IL	5
MD	5
MI	5
MN	7
NC	6
NJ	3
OH	1
OR	3
TX	19
VA	29
WA	20
WI	10
International	
Sweden	1
Canada	1

**Stormwater
BMPs**

**Volume
&
Pollutant
Reduction**

**Assessment
Levels**

FIGURE 1 presents plots of inflow vs. outflow for Biofilters (swales and filter strips), Detention Basins (dry ponds), Retention Ponds (wet ponds) and Wetland Basins. Hydrodynamic devices and filters were not included as they do not reduce runoff volumes. Biofilters showed an average of about 40 percent less volume of outflows as compared to inflows for the storms monitored. Dry-extended detention systems showed 30 percent less volume of such outflows. The other BMPs showed a large scatter, but generally showed an increase in runoff volumes.

TABLE 2 (see page 4) presents the results of removing the smaller more insignificant storms from the analyses (storms less than 0.2 watershed inches). It is apparent that detention basins (dry-ponds) and biofilters (vegetated swales, overland flow, etc.) appear to contribute significantly to volume reductions, even though they were likely not specifically designed to do so. Based upon the recommended criteria above for assessing BMP performance, it appears that there is a basis for factoring in volume and resulting pollutant load reductions into BMP performance. This has significant implications for TMDL implementation planning and other stormwater management planning. As BMPs that are specifically designed to reduce runoff volumes (e.g., lower impact development, etc.) are tested and information added into the database, these results will improve.

Water Quality Performance

The analysis of BMP water quality performance data is comprised of three levels:

- 1) a comprehensive evaluation of effluent vs. influent water quality for each BMP study
- 2) comparisons of effluent quality amongst BMP types
- 3) comparisons of performance vs. design attributes for BMP types and individual BMPs

Even with the increase in data in the database since the last evaluation, the total number of BMPs in any one category is still relatively small as compared to the number of design parameters and other regional factors that can be potentially investigated (Table 1).

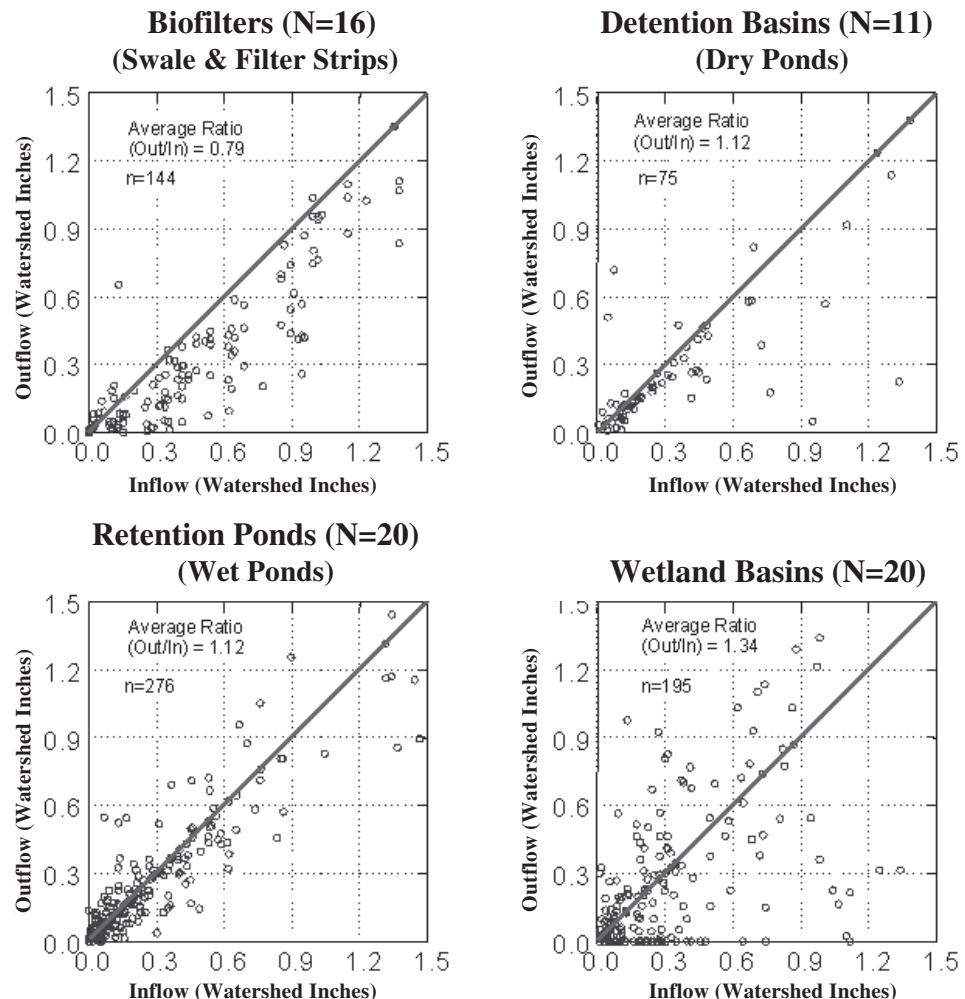


Figure 1: Comparison of Individual Storm Inflow and Outflow Volumes for Indicated BMPs (N= number of BMPs included; n= number of storm events)

Stormwater BMPs

Problematic Results

EFFLUENT QUALITY

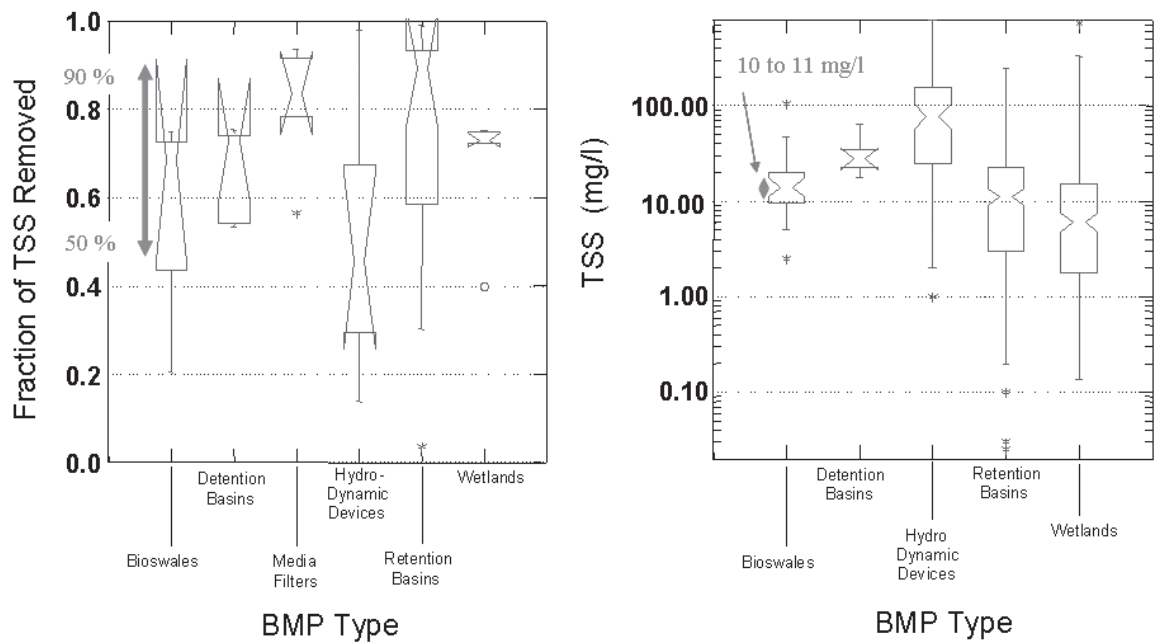
Effluent quality is much less variable than the percent removed (or fraction removed) for BMP studies, as shown in Figure 2, which shows box plots by BMP types of the fractions of total suspended solids (TSS) removed and box plots of TSS effluent quality. The box plots present the median, the upper and lower 95 percent confidence intervals of the median, and the 25th and 75th percentiles.

As has been found previously (Strecker et. al., 2001), it appears that percent removal is more-or-less a function of how “dirty” the inflow is. That is, even with a high percent removal, a treatment system handling highly polluted inflow may well result in problematic — though “treated” — effluent quality. What is new from the analyses of the expanded database is that effluent quality can now be assumed to be different amongst different BMP types for some parameters. It appears that Retention Ponds (wet ponds) and Wetlands can achieve lower concentrations of TSS (and other parameters) than other BMPs, while hydrodynamic devices were the lowest performers (higher effluent concentrations) on average for TSS. As a comparison, the 95% confidence interval for the median wet pond removal is between about 50 and 90 percent (a little better than 0-to-100), while the median effluent quality 95% confidence range is between approximately 11-to-18 mg/l (milligram per liter).

TABLE 2: Ratio of Mean Monitored Storm Event Outflow to Inflow for inflow Storms Greater than 0.2 watershed inches.

BMP Type	Mean Monitored Outflow/Mean Monitored Inflow for Events Greater Than or Equal to 0.2 Watershed Inches
Detention Ponds	0.70
Biofilters	0.62
Media Filters	1.0
Hydrodynamic Devices	1.0
Wetland Basins	0.95
Retention Ponds (wet)	0.93
Wetland Channels	1.0

FIGURE 2: Box plots of the fractions of total suspended solids (TSS) removed and of effluent quality of selected BMP types, by BMP Study



Stormwater BMPs

Figure 3
Paired Box Plots of Influent & Effluent Quality (Inflow: Lighter Shade On Left Outflow: On Right) Selected BMPs: Total and Dissolved Copper - By Event -

FIGURE 3 shows the influent and effluent box total and dissolved copper box plots for event data (each event considered separately). For all BMP types, total copper influent and effluent can be assumed to be different for all BMP Types. However, for dissolved Copper concentrations only bioswales and wet ponds appear to have effected concentrations. Note that incoming dissolved concentrations are quite low and therefore this effects "efficiency."

— Figure 3 —

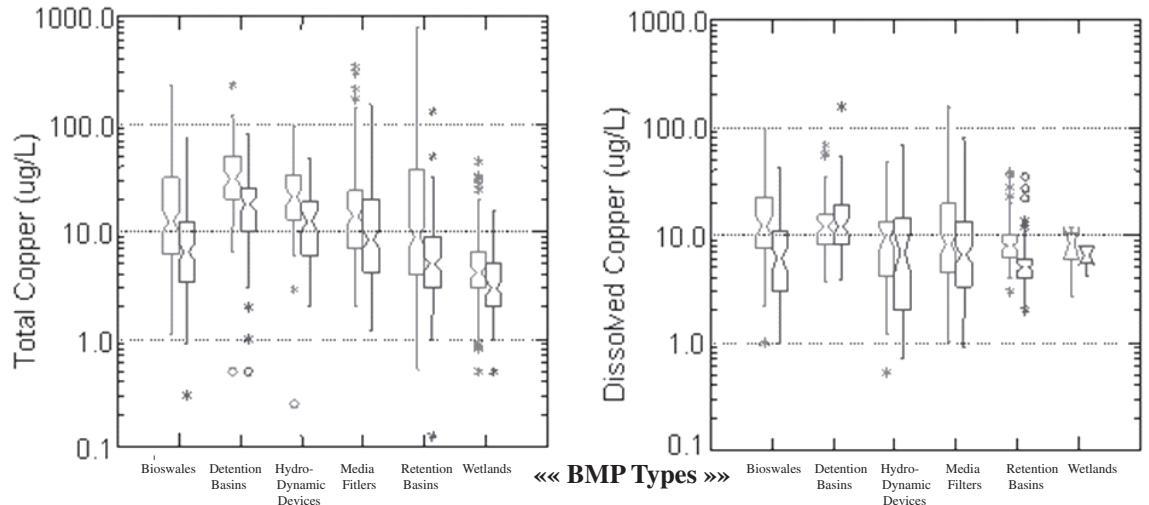
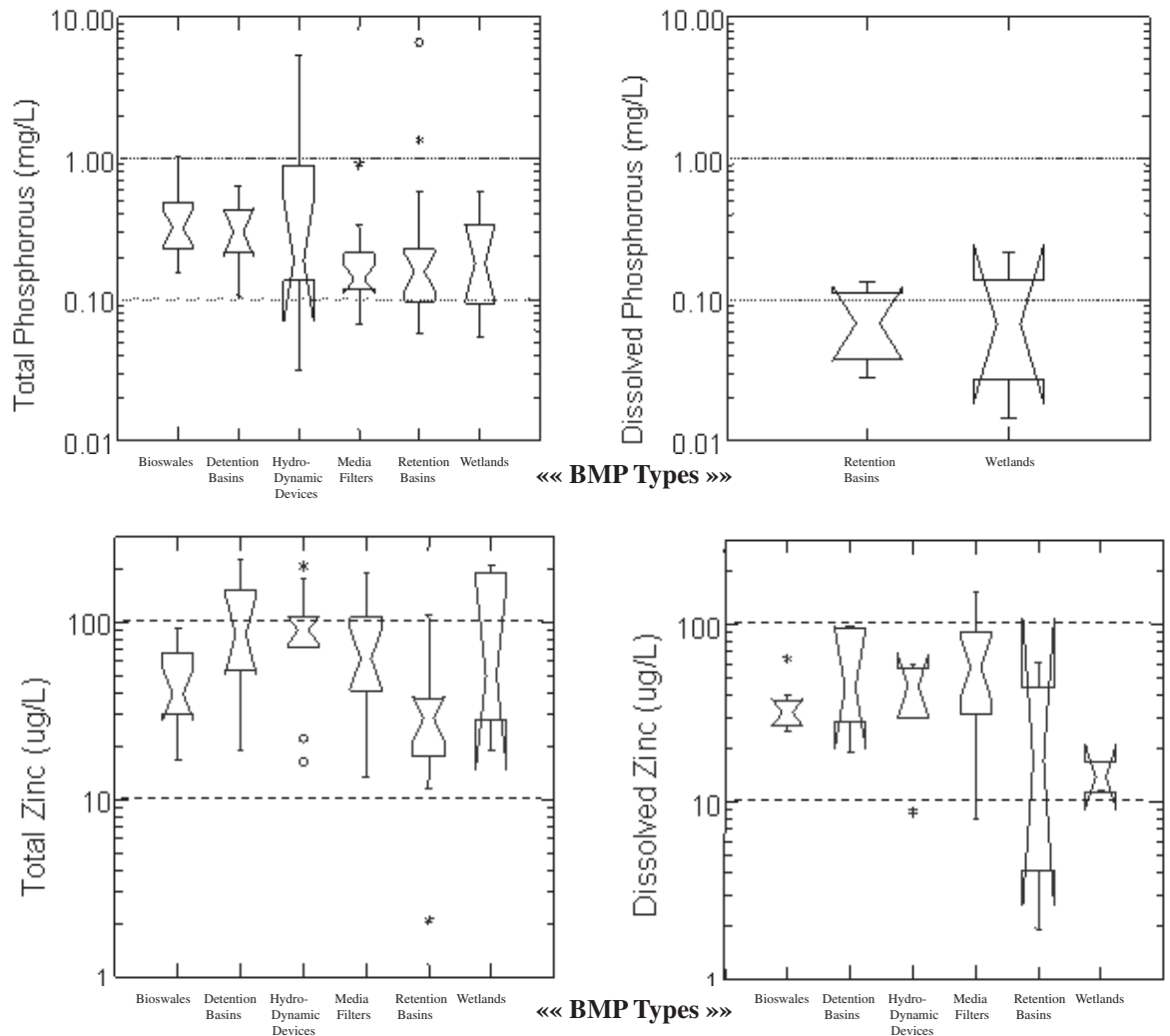


Figure 4
Box Plots of Effluent Quality of Selected BMPs for Total & Dissolved Phosphorus and Zinc - By BMP Type - (further description on next page)

— Figure 4 —



Stormwater BMPs

Phosphorus

Performance Ranges

Water Hardness

FIGURE 4 (previous page) shows the effluent quality results for comparing total and dissolved zinc and phosphorus for the same BMP categories weighted by BMP study (each BMP Study is a single data point). For dissolved constituents, data is still somewhat sparse. In these plots, the effluent quality of hydrodynamic devices is somewhat more consistent with other BMP types; this may be a confirmation of the work by Sansalone et. al. (1998) which showed that a sizable proportion of some pollutants are associated with fractions that may be removable via limited detention time devices. Some of his current work is demonstrating this in more detail (Sansalone, 2004). It is interesting to note that the lowest effluent quality achieved for phosphorus is about 50-to-60 ug/l (micrograms per liter). This contrasts with TMDLs or other water quality programs where the ultimate phosphorus goal has been set to 10-to-20 ug/l and then showing achievement of such goals by misapplication of percent removal approaches. For example, in some TMDL implementation efforts, BMPs are “assigned” certain percent removals. In order to assert that a BMP program for a site meets these low levels, designers have sometimes resorted to “daisy-chaining” BMPs to apply multiple percent removals to meet the requirements (e.g., employing three wetlands in a series and then applying a 60 percent removal for each). However, an effluent quality of 50-to-60 ug/l is a significant reduction as compared to typical urban runoff concentrations.

Fecal Coliform

Human pathogens are increasingly of concern in stormwater discharges. Debate continues over the usefulness of the fecal coliform test as an indicator of human pathogen levels in urban stormwater.

FIGURE 5 shows a comparison of influent and effluent fecal coliform box plots for the indicated BMP types and a more detailed look at wet ponds. It should be noted that this is grab sample data. From the plot, it is apparent that some BMPs appear to be able to reduce fecal coliform concentrations (including media filters and retention ponds) while others cannot yet demonstrate reductions. The second plot for retention ponds demonstrates the influent and effluent quality observed for wet ponds — where the wet ponds appear to have a significant effect. It should be noted that in cases where there is heavy wildlife use, increases have been found.

— Figure 5 —

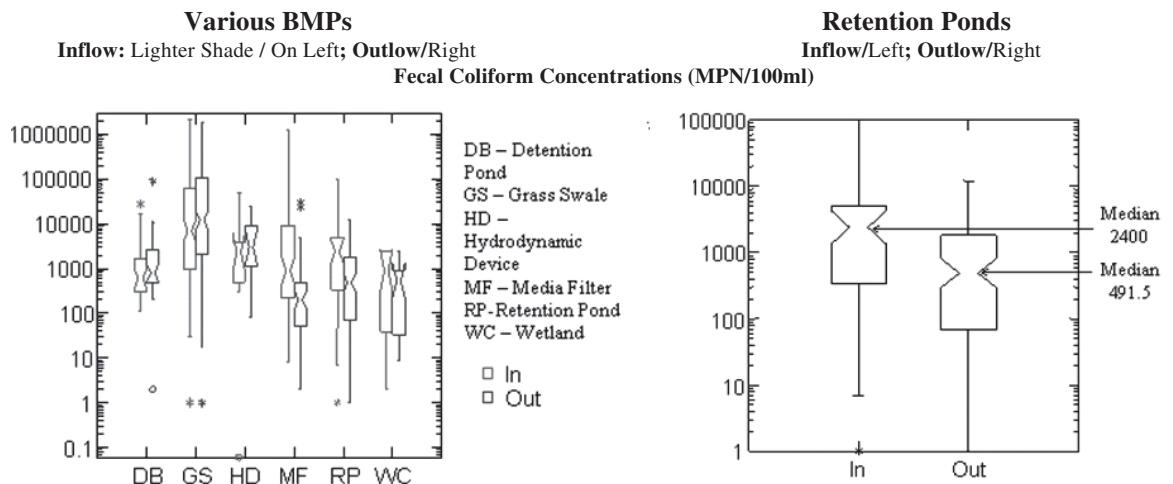


Figure 5. Box plots of effluent quality of selected BMP types for Fecal Coliform and Fecal Coliform inflow and outflow highlighted by event.

Some of the other assessments that are being performed are the potential reductions in toxicity of heavy metals by BMPs. More recent BMP studies have been collecting data on water hardness and therefore there is an ability to assess potential toxicity issues via comparisons of effluent quality with EPA acute and chronic criteria values (as benchmarks as the criteria apply in receiving waters). One trend that your authors have noticed in the data is that for many BMPs, hardness levels are increased in BMP effluent (compared to influent). This hardness increase could contribute, along with concentration reductions, to reduced toxicity (as defined by EPA’s Acute Criteria for Aquatic Life). We will also be looking at the effects of BMPs on load reductions considering both hydrological source control performance as well as effluent quality.

Stormwater BMPs

Pond Size & Treatment Volume

DESIGN VS. PERFORMANCE

During the initial evaluation no statistically significant relationships between design parameters and performance were found (Strecker, et. al., 2001). This included retention ponds and wetlands and their treatment volume relative to measured storm events.

FIGURE 6 shows box plots of Retention Pond mean influent and effluent quality for sites with ratio less than one and greater than one ratio of the treatment volume to mean monitored storm event volume — e.g. how big the pond is as compared to average volumes of storms measured. The plots clearly demonstrate that at those sites where the wet pool treatment volume was greater than the average size storm event inflows monitored, the effluent quality was significantly lower. In addition, the variability of effluent quality for the larger retention ponds was lower. These results are expected, but it is one of the first times that they have been demonstrated statistically.

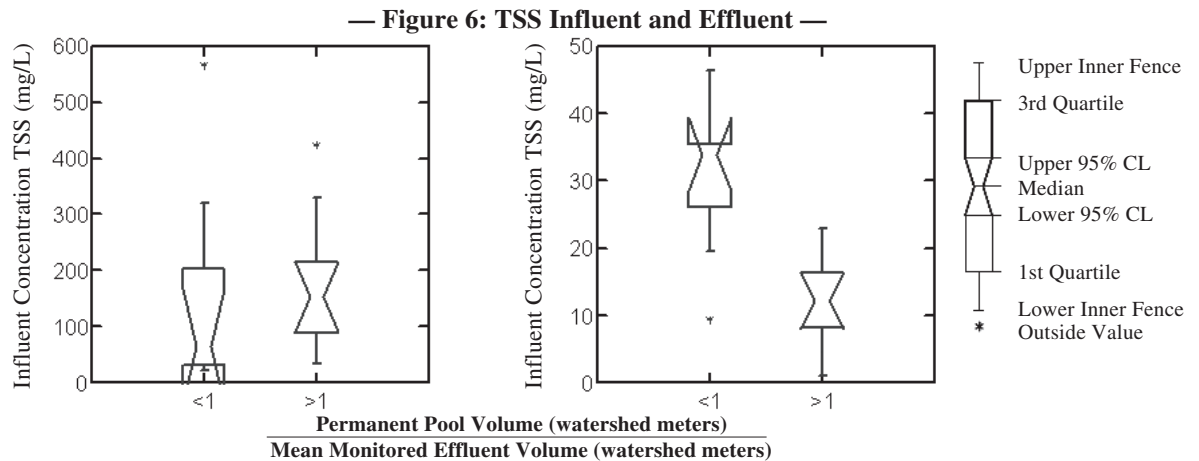


Figure 6. Box plots of the TSS influent and effluent quality of sites grouped by a ratio of less than or greater than 1 for the ratio of the permanent pool volume to mean monitored effluent volume by BMP study.

Assessment Basis

FIGURE 7 shows effluent comparisons for the same ratio for total phosphorus and total zinc. Note that for phosphorus, for the sites with a ratio less than one, it cannot be concluded that the BMP had an effect. For sites that are of the average size inflow, performance is better. It should be noted that this ratio is based upon the average size inflow volume and not the average sized rain event. One should not use the average size event at a rain gage as a basis for asserting BMP sizing; an average rain event would include many events that did not produce runoff or very little runoff.

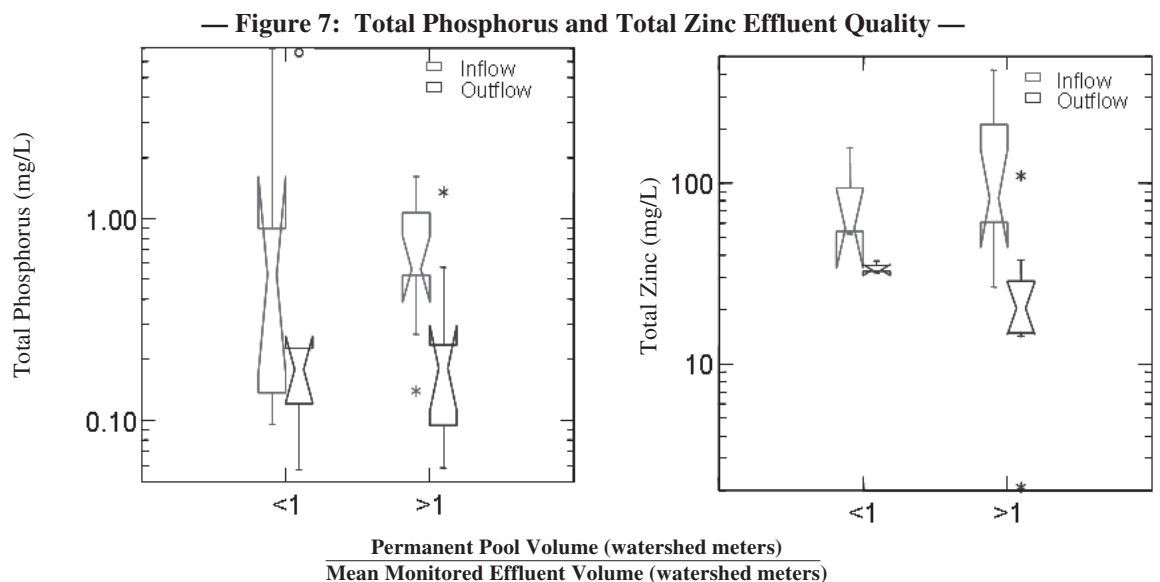


Figure 7. Box plots of the total phosphorus and total zinc effluent quality of sites grouped by a ratio of less than or greater than 1 for the ratio of the permanent pool volume to mean monitored effluent volume by BMP study.

Figure 7
Paired Box Plots
Inflow: Lighter Shade
(On Left)
Outflow: On Right

**Stormwater
BMPs
"HSC"**

Simulation

**Standards
Considerations**

**Targeted
Pollutants**

**Defensible
Acceptance**

Implications for Setting of BMP Design Requirements and TMDLs

The analysis of water quantity and water quality performance of BMPs is very useful in the consideration of setting of stormwater design standards and development of TMDL implementation plans.

SOME RECOMMENDATIONS INCLUDE:

- Design standards should account for the hydrologic losses (HSC) that can occur with some BMP types to encourage their use. Both biofiltration systems and dry extended detention ponds appear to show significant reductions in the runoff routed through them.
- Continuous simulation techniques should be employed to assess potential BMP design sizing (as opposed to "percent capture") to ascertain what the potential hydraulic performance of BMPs will be over long-time periods. Given the expenditures of resources by the private and public sector on BMPs, it is imperative that those setting standards should conduct these more detailed assessments with more local rain gages to assess the hydrologic and hydraulic performance of BMPs. Using a 24-hour rainfall analysis to set standards is problematic.
- BMP types should be considered in setting standards. For example, a storm depth (volume) measurement is relatively meaningless for a vegetated swale. For "flow-through" BMPs, an analysis of hourly or 15 minute data is more appropriate.
- BMPs should be targeted based upon expected performance of BMPs with regard to "pollutants-of-concern." For example, if TSS and dissolved copper are the constituents of concern, then a hydrodynamic device alone is not likely to address the issues. Several efforts are under way to develop "unit processes" descriptions of BMP performance. The results of these efforts, together with other updated BMP performance information, should be used to evaluate the potential results of employing various BMP types. It is likely that given the wide mixture of pollutants-of-concern, that multiple, sequential BMPs ("treatment train" approaches) will prove most effective.
- BMP "Acceptance" is becoming a larger issue for communities. Are all "BMPs" acceptable regardless of performance? One problem that BMP vendors face is regulatory requirements that appear to state that one selected treatment BMP for any area must "do it all"—when in fact, in most cases a well designed treatment train is sufficient and may be preferable. Vendors, to stay in business, seem encouraged to make claims to be all encompassing. Developing acceptance standards that are defensible and which result in well-performing BMPs, will become an increasing goal of BMP requirement programs. An example of the problems of BMP acceptance is presented in Figure 8. By almost all current BMP acceptance criteria, this BMP would be accepted for its greater than 80 percent removal. One has to consider, though, whether an average effluent quality of over 100 mg/l is acceptable. Compared to other BMPs' effluent quality, it is not. That is not to say that this BMP type might not serve a valuable role as initial treatment in conjunction with stormwater wetlands.

Table 3. George Field Study Evaluation of a Vortechs model 11000

Runoff Event #	TSSin (mg/L)		TSSout (mg/L)		% Reduction	
	Interpolated	Arithmetic	Interpolated	Arithmetic	Interpolated	Arithmetic
1	987.48	693.52	263.18	205.98	73%	70%
2	128.73	88.57	59.23	59.18	54%	33%
3	1040.04	882.42	337.87	486.75	68%	45%
4	213.73	225.42	359.14	388.08	-68%	-72%
5	1673.57	1217.53	71.39	102.84	96%	92%
6	535.16	603.54	70.14	85.23	87%	86%
7	180.81	132.22	29.76	34.88	84%	74%
8	2491.55	2202.78	35.41	35.47	99%	98%
9	89.99	76.60	31.98	33.14	64%	57%
10	1047.02	2257.46	37.08	31.22	96%	99%
11	439.45	344.86	16.57	13.83	96%	96%
12	445.19	291.58	17.36	14.91	96%	95%
13	1156.16	674.94	44.72	37.91	96%	94%
Averages	802.2215	745.4954	105.6792	117.6477	87%	84%

(Winkler and Guswa 2002)

CONCLUSIONS

An evolving tool is available to practitioners who are assessing the performance of BMPs via the International Stormwater Best Management Practices Database Project. Practitioners can perform their own evaluations via downloading of information from the web site.

Results of the analyses of the now expanded database have reinforced the initial findings that BMPs are best described via: their ability to reduce runoff volumes; how much of the runoff record is treated (and not treated); and, of the treated runoff, what does the effluent quality and characteristics (potential toxicity) look like. Differences in the effluent quality of various BMP types can be statistically characterized. BMPs design factors, including sizing, are becoming more statistically discernible in the BMP type data sets as the number of studies assessed grows. Continued expansion of the BMP database with additional studies will improve the ability to discern performance when considering BMP selection and design. The BMP database provides a useful tool to develop more accurate design requirements for stormwater BMPs as well as implementation plans for TMDLs that will be more targeted at achieving desired outcomes.

THESE BASIC BMP PERFORMANCE DESCRIPTION ELEMENTS CAN BE UTILIZED TO:

- assess the concentrations that BMPs are able to achieve (concentration TMDLs)
- more accurately assess effects on total loadings (TMDLs), including how much runoff is prevented or treated and more realistic estimates of resulting loads
- determine the frequency of potential exceedances of water quality criteria or other targets
- establish/utilize other desired water quality performance measures.

For now, designers are urged to utilize a treatment train approach for BMPs wherever possible. The approach should consider: the pollutants of concern and their form; the unit processes that are needed to remove those pollutants; and the unit processes that occur in significance in various BMP types. For example, as Figure 8 shows, if one is interested in removing multiple pollutant types, then a treatment train has many advantages. Using a treatment train will help to account for the inherent variability and uncertainties that are associated with BMP performance. Designers should employ conservative criteria, including sizing and focusing on longer residence times for volume based BMPs, as well as larger sizing of filters and other flow-through BMPs (see ASCE/WEF 1998 *Water Quality Manual of Practice*).

— Figure 8 —

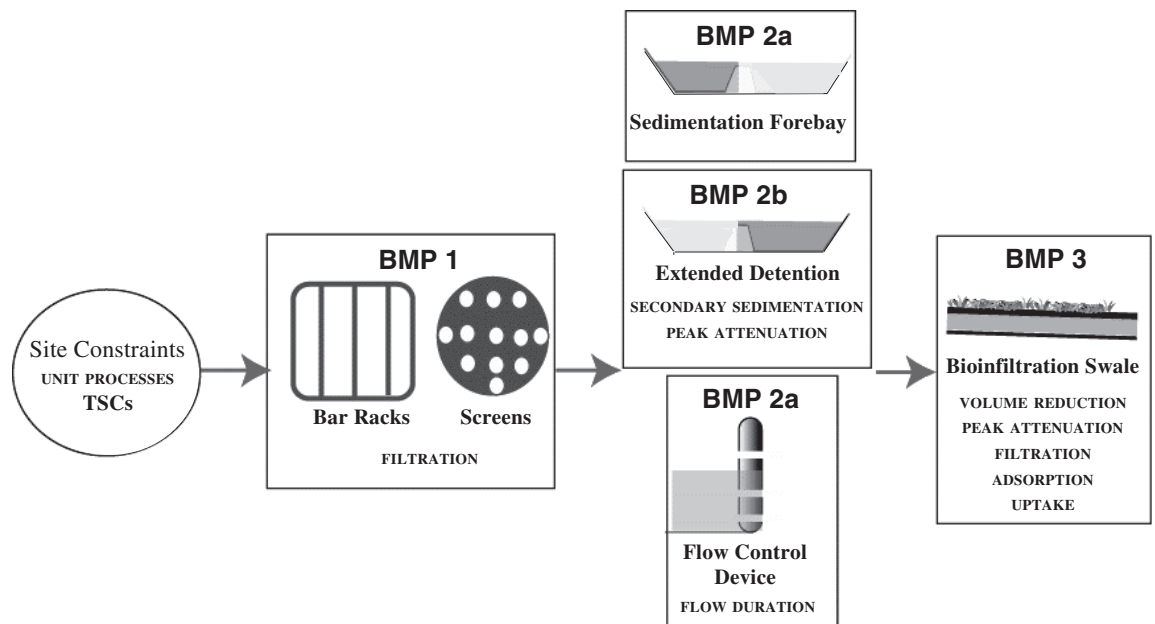


Figure 8. A treatment Train designed to remove Trash/Debris, TSS and Dissolved Copper

Finally, it is important to minimize the increase in runoff. Typical urban development has severely reduced evapotranspiration (ET) and infiltration. Too often, we think infiltration could be the answer in areas where pre-development infiltration was minimal, but is eliminated due to soils and/or slope conditions concerns. We need to look at ways of mimicking pre-development evapotranspiration rates as the first step in stormwater management. It is often the case that pre-development evapotranspiration may be

Stormwater
BMPs
Best Description
Criteria

Goals
Supported

Train
Preferred

Minimizing
Runoff

Stormwater BMPs

as high as 80+ percent of rainfall. If we infiltrate all of that water, then we will have increased infiltration greatly over pre-development.

TO INCREASE ET, THE "SPONGE" SHOULD BE RESTORED WHICH INCLUDES MORE:

- Trees, Shrubs and Grasses
- Shallow soils (non compacted)
- EcoRoofs

Stormwater Management is a difficult task, but we need to keep applying new knowledge that is carefully evaluated for specific situations.

For Additional Information:

ERIC STRECKER, PE, Principal, GeoSyntec Consultants (Portland, OR), 503/ 222-9518 or email: estrecker@geosyntec.com

MARCUS QUIGLEY, PE, Project Engineer, GeoSyntec Consultants, (Boxborough, MA), 978/ 263-9588 or email: mquigely@geosyntec.com

BEN URBONAS, PE, Chief, Master Planning and South Platte River Programs, Urban Drainage and Flood Control District (Denver, CO) 80211, 303/ 455-6277 or email: burbonas@udfcd.org

JONATHAN JONES, PE, Chief Executive Officer, Wright Water Engineers, Inc. (Denver, CO) or email: jonjones@wrightwater.com

EPA/ASCE BMP WEBSITE: www.bmpdatabase.org

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Eric Strecker, Ben Urbonas, and Jonathon Jones are the Principal Investigators for the International BMP Database Project. Marcus Quigley assisted with the data analysis. The project team was awarded the National 2003 State-of-the-Art in Civil Engineering Award by the American Society of Civil Engineers for this project.

Eric W. Strecker, P.E. is a Principal and Water Resources Practice Leader with GeoSyntec Consultants in Portland, Oregon. He has over 20 years of stormwater management experience, including national level applied research efforts for EPA, FHWA, WERF, and NCHRP as well as state and local stormwater management, design and research projects throughout the western United States

Ben R. Urbonas, P.E. has over 40 years of experience, including over 25 years with the Denver Urban Drainage and Flood Control District. He is currently the Chief, Master Planning and South Platte River Programs. He has completed or overseen over 110 stormwater master plans and has published extensively on stormwater management.

Jonathon E. Jones, P.E. is the Chief Executive Officer of Wright Water Engineers, Inc. in Denver, Colorado, where he has worked for almost 25 years. He works on urban stormwater management projects around the United States.

Marcus Quigley, P.E. is project engineer in GeoSyntec Consultants in Boston, Massachusetts. He has more than 8 years of experience in stormwater management, including stormwater modeling, monitoring, and management planning.


COLORADO GROUNDWATER LAW


by David L. Harrison, Partner
Moses, Wittemyer, Harrison and Woodruff PC (Boulder, Colorado)

INTRODUCTION

The legal framework of Colorado's groundwater law has been evolving since 1965, following the passage of the Colorado Ground Water Management Act (§ 37-90-101, et seq., C.R.S.: "1965 Act"). Particularly at first glance, the system looks messy – complicated classifications have emerged that are difficult to treat logically and that do not appear to be consistent. Five major classifications have evolved: Designated groundwater; Tributary Groundwater; Non-tributary Groundwater; Not Non-tributary Groundwater; and Exempt Wells. Viewing the classifications on a geographic, basin-by-basin basis, however, affords a better understanding of Colorado's approach.

First, there are general rules that apply throughout the state, except in designated basins and the Denver Basin.

THE GENERAL RULES FOR GROUNDWATER ARE AS FOLLOWS:

- All groundwater is treated as tributary to surface water streams (the burden to prove to the contrary is on the party opposing the assumption)
- Groundwater is considered to be tributary (to surface water) if its withdrawal will cause a stream depletion within 100 years greater than 0.1% of the annual rate allowed to be pumped (§ 37-90-103(10.5), C.R.S.)
- Prior Appropriation system applies to tributary groundwater
- Well permits are required: to obtain a permit, there must be unappropriated water and no material injury to other vested water rights (usually requires an augmentation plan). An "augmentation plan" is a way for junior appropriators to obtain water supplies through terms and conditions approved by a water court that protect senior water rights from the depletions caused by the new diversions. Typically, they will involve storing junior water when in priority and releasing that water when a call comes on, purchasing stored waters from federal entities or others to release when a river call comes on, or purchasing senior irrigation water rights and changing the use of those rights to off-set the new users injury to the stream.
- Adjudicated in Water Court
- Exemption for small wells – exception for limited agricultural, domestic and some commercial water users based on minimal nature of use (see § 37-92-602 (1)(b)-(f), C.R.S. for details on the five categories of exempt wells). The exemption for small wells is a true exemption: the water use is exempt not only from permitting, but also from any senior user's "call" for regulation under the priority system.

DESIGNATED GROUNDWATER BASINS

The first special category to be dealt with is that of "designated basins". Pursuant to the 1965 Act, a designated groundwater basin could be formed. Eight such basins have been created, all on the eastern plains of Colorado and all prior to 1985. In order for groundwater to be designated and a designated groundwater basin formed, the groundwater must be either: (1) non-tributary to surface water, i.e. the groundwater would not be available to and required for the fulfillment of decreed surface rights; or (2) in an area not adjacent to a continuously flowing natural stream and groundwater withdrawals in the area have constituted the principal water use for at least 15 years prior to the date of the first hearing on proposed designation of the basin.

"Mining" of groundwater may be allowed in such basins since a regulated rate of depletion is allowed. "Mining" occurs when the rate of depletion exceeds the rate of recharge of the groundwater aquifer. Some of the basins have chosen to allow mining and some are managed on a sustained yield basis. Within designated groundwater basins, a "Modified Prior Appropriation" system applies. There is no history of regulation of use among existing users; the regulation has mostly involved new or changed well permits. There has been no enforcement of a "call" by senior well users against junior users.

Special rules exist for small wells. Some exports of water out of designated basins to municipalities have been approved — such exports are not prohibited if there is no injury. Where there is already a regulated rate of depletion, an offset may be required with either a reduction in the flow rate or an

Major Classifications**General Rules****Requirements****"Mining"**

Colorado Groundwater Law

Management Districts

Stipulation To Regulate GW

GW Model

Non-Renewable

Planned "Mining"

"Not Non-Tributary"

Allocation Not Management

augmentation plan necessary for the export. In general, groundwater within the designated basins is fully allocated, and thus there are few situations where new permits will be issued.

The Ground Water Commission has specific rules and regulations to regulate and administer designated groundwater. The 12-member commission has nine members appointed by the Governor and the other three members are the Executive director of the Department of Natural Resources, the State engineer and the director of the Colorado Water conservation Board.

Resident taxpaying electors have a statutory option to petition for an election to form a groundwater management district, in any part of the designated basin, to establish local control. A management district is authorized: to exercise powers of taxation; regulation/curtailment; and research and administration of designated groundwater. There are currently 13 groundwater management districts within the eight designated groundwater basins. The Districts are the local enforcement arm of the Commission and generally oppose transfers out of the District.

Legal disputes with the Ground Water Commission and the groundwater management districts are decided in the District Court of the county where the dispute arises, or, in the case of an appeal from a rule adopted by the Ground Water Commission, in the Denver District Court.

Republican River Basin (*Kansas v. Nebraska*)

Groundwater in the Republican River basin is affected by the recent settlement in *Kansas v. Nebraska & Colorado*, No. 126 Original, which concerned the Republican River Compact. The 1942 Compact entered into between Kansas, Nebraska and Colorado apportions the surface flows of the river system between the three states but does not directly mention "groundwater." The special master found, however — and the states subsequently agreed by stipulation — that since groundwater affects surface flows, groundwater use is to be regulated to meet the apportionment of the states. The main issue in the case was the extent that wells in Nebraska and in Colorado cause material depletion of state-line flows (into Kansas).

The settlement reached by the three states is interesting in that the states agreed on a process for a groundwater model that will determine future compliance with the Compact. To assist in compliance with the compact, Colorado passed a new law in June 2004 creating the "Republican River Water Conservation District." The District has taxing and regulatory power. The District may, in fact, need to buy back some existing pumping rights in order to meet obligations to downstream states.

[For additional information regarding the Republican River Compact, see the Colorado Division of Water Resources website: <http://water.state.co.us/wateradmin/RepublicanRiver.asp>]

Denver Basin

The law governing the Denver Basin is unique, essentially dealing with non-tributary groundwater outside the Constitutional system of appropriation. Legislation passed in 1985 (SB 5) was specifically intended as an allocation of the groundwater in the basin, particularly in view of the fact that the groundwater is non-renewable. SB 5 also contained the first statutory definition of "nontributary ground water" (nontributary if its withdrawal will not deplete the flow of a natural stream within 100 years of the time of pumping to the extent of 0.1% of the annual rate allowed to be pumped: § 37-90-103(10.5), C.R.S.).

In the Denver Basin, the overlying landowners are allowed to "mine" all the groundwater in the Denver Basin aquifers, allocated on the basis of a 100-year life (aquifers: Laramie-Fox Hills, Lower Arapahoe, Upper Arapahoe, Denver and Dawson). This allocation specifically included the portions of those aquifers that are not nontributary (i.e. fail to meet the 100-year/0.1% depletive effect test). Where "non-tributary ground water" is concerned, users must relinquish 2% of the water pumped as return flow, whereas for "not non-tributary ground water", users must have an augmentation plan approved by the Water Court, replacing 4% of the water pumped.

The term "not non-tributary" is naturally confusing. The term emerged because when the legislation was first being discussed it was widely assumed that the deep ground water formations were non-tributary. When it became apparent that some of the water was not non-tributary, the double negative stuck. A better way of understanding the distinction the term represents is to say that while the groundwater is tributary, it is non-renewable, and is subject to the rate of depletion rules applicable in the basin. There is no protection of pressure levels, although concern about the rate of pressure decline is increasing. Large drawdowns of artesian pressure have occurred, but not necessarily large depletions of the ultimate volume of water.

SB 5 was not intended as a management act, but simply as an allocation of the groundwater. People involved with its passage naively thought that management of the resource (such as requiring it to be used conjunctively with surface water) would follow, but so far it has not.

Colorado Groundwater Law

"1996 Rules"

No Depletion Standard

Augmentation Plans

Drought Crisis

Seniors Curtailed

POD Change To Surface?

"60/40" GW-to-Surface

Arkansas River Basin (*Kansas v. Colorado*)

The State of Kansas commenced suit in 1985 alleging violations of the 1949 Arkansas River Compact by Colorado. The Special Master in that case eventually found "that post-compact pumping in Colorado has caused material depletions of the usable stateline flows of the Arkansas River, in violation of the Arkansas River compact," and the finding was upheld by the Supreme Court (Special Master Report, July 1994, *Kansas V. Colorado and United States*, No. 105 Original, U.S. Supreme Court, vol. II, p. 263).

Based on that litigation, well users found themselves in a new legal regime in 1996 with the adoption by the State Engineer of amended rules and regulations governing well pumping in the Arkansas River Basin ("1996 Rules"). The 1996 Rules impose a full-time augmentation requirement on all wells in the Arkansas Valley, either through augmentation plans approved by the water judge or through replacement plans approved annually by the State Engineer.

The standard, which comes directly out of the Compact and which is now applied by the rules and regulations to the wells, is that there must be no depletion to useable flow at the state-line. The impact on Colorado groundwater users has been significant. Well pumping prior to the suit was consistently over 200,000 acre-feet per year, reaching 287,000 in the dry year of 1976. Under the 1996 Rules it dropped to approximately 120,000 acre-feet in 1997, a relatively wet year, and fell to 50,000 acre-feet in the recent dry year of 2003, when the availability of replacement supplies severely limited potential pumping. More than 800 wells in the Arkansas River Basin have been placed on "inactive" status by their owners under the applicable rules. Several well user organizations have formed in the Basin to provide well augmentation services, at considerable cost to the well users.

South Platte River Basin

Groundwater users in the South Platte River Basin also have rules and regulations that specifically address their basin. A stipulation, arising from litigation in the basin, was entered into in 1974 providing amended rules and regulations. The 1974 Rules were adopted by the State Engineer and are still in effect today. Considerable controversy built up over subsequent years about the implementation and enforcement of these rules, culminating in new legislation requiring the phasing-in of rigorous compliance with requirement of water court adjudication of the plan for augmentation. They provide for total curtailment of well pumping, unless the well is operating pursuant to a water court approved plan for augmentation. The result has been a huge wave of augmentation plans filed and now pending in the basin.

Rio Grande Basin (*San Luis Valley*)

A large amount of groundwater is used in the Rio Grande basin and the basin is fully appropriated. The groundwater there is tributary to the stream system and is renewable water, with recharge to the aquifer occurring from streamflow from the surrounding mountains. The Basin contains an unconfined aquifer (water table) and a confined aquifer (artesian). Recent drought years have created a crisis in water table and pressure levels, as well as stream flows.

Following Supreme Court litigation brought in 1966 by Texas and New Mexico, Colorado now rigorously enforces the Rio Grande Compact of 1938 to meet state-line flow requirements. Every year, senior surface water rights are curtailed to meet Compact delivery requirements (priorities sometimes as early as the 1860's), while wells are allowed to continue being fully pumped. During litigation in the *Alamosa-La Jara Water Users Protection Association v. Gould* case (See Supreme Court ruling at 674 P.2d 914 (Colo. 1983), it was acknowledged that well pumping was depleting surface flows and affecting water rights, but a huge underlying issue was raised: would it be better and a more "reasonable means of diversion" to require surface water rights to construct wells as their point of diversion? The argument was that by doing so, water users would "make" more water by eliminating evapotranspiration. This issue was based on the "waterwheel doctrine" that a reasonable means of diversion is required, i.e. one can't command the entire flow of the river for one's use. The Supreme Court basically remanded that issue to the State Engineer for further rule making, taking into account economic and environmental factors.

Instead, surface water and groundwater users on the Rio Grande and Conejos Rivers entered into an agreement in 1985 that came to be known as the "60/40 Agreement." The Agreement provides that the usable yield of the Closed Basin Project will be divided between the Rio Grande and Conejos Rivers, with the Rio Grande receiving 60% and the Conejos 40%. The Closed Basin Project is a federal reclamation project designed to provide water from the unconfined aquifer of the Closed Basin for delivery to the Rio Grande River to help meet Colorado's obligations under the Rio Grande Compact. In consideration of the Closed Basin allocations, the agreement provided that during its duration the parties waive all

Colorado Groundwater Law

Goals

Taxing for Purchases

Hybrid Right

Conjunctive Use

“Mining”

Artesian Wells

Flexibility

claims of injury resulting from 1985 use levels of then-existing wells. The 60/40 Agreement has managed to provide peace, at least until the 1990's. However, with drought conditions that have persisted in recent years, water levels have declined and mounting concern and controversy have plagued the San Luis Valley. Meanwhile, 1998 legislation recognized that special conditions exist in the confined aquifer in the San Luis Valley and called for rules and regulations for new withdrawals from the confined aquifer. Those rules and regulations have now been published by the State Engineer and are pending approval in Water Court.

New legislation (SB 222 (2004)) provides additional authority for rules and regulations to address:

- Long-term sustainability
- Protection of surface water rights
- Aquifer water table and pressure level protection
- Subdistricts – to replace depletions and balance aquifers

The local subdistrict rule allows for the possibility of using taxing powers to buy back some water rights to get the system into a water budget balance. The legislation also clarifies that owners of senior surface water rights are not required to develop wells before calling. It also clarifies that “salvage” of water by reducing evapotranspiration from native plant communities could not be considered a source of unappropriated water for proposed new wells.

Great Sand Dunes National Park Water Rights

The Great Sand Dunes are recognized as a remarkable ecosystem and the National Monument has been authorized by Congress in 2000 to be upgraded into a National Park. With leadership from the local agriculture community, the legislation created an in situ water right for the Great Sand Dunes.

This express appropriative water right, protecting the ground water table and stream flow for park values, is essentially a hybrid federal/state creation. It is important to note that the water right is an explicit federal right, not a federal “reserved” water right (a federal “reserved” right is a water right that was implicitly “reserved” for the purpose of the federal land when it was brought into the public domain).

Recurrent Issues in Colorado Water Law

In all these different regions there have been three paramount issues under Colorado water law which have driven policy decisions, and these are issues that will continue to confront with water users:

- Whether and how will surface water rights be protected in conjunction with groundwater rights?
- Should groundwater be allowed to be “mined” beyond its recharge capacity or managed for sustained yield?
- Should pressure levels of artesian wells be protected?

These issues have been treated differently from basin to basin in Colorado. If there is any general principle to be extracted, it is that water users in each basin will have considerable freedom to fashion their own policy regarding these issues based on their local situations.

FOR ADDITIONAL INFORMATION:

DAVID L. HARRISON, Moses, Wittemyer, Harrison and Woodruff PC, 303/ 443-8782 or email: dharrison@mwhw.com

David L. Harrison is a practicing water resources lawyer in Boulder, Colorado with the firm of Moses, Wittemyer, Harrison and Woodruff, P.C., of which he is a shareholder and president. Mr. Harrison has been representing municipalities and agricultural users in water resource problem solving since 1972. A major area of interest in this practice has been the resolution of ground water-surface water conflicts, including negotiation and litigation based upon complex hydrogeologic science and computer modeling. David served as a member of the Colorado Water Conservation Board from 1989 through 1997. He was a member of the Board of Governors of the Nature Conservancy from 1980-1990, and was Chairman of the Board during 1988 and 1989.

Editor's Note: This article is based on a presentation by David Harrison at the “Groundwater in the West” Conference sponsored by the Natural Resources Law Center at the University of Colorado. Some additional material was added from the article “Intro to Ground Water Law in Colorado and Surface-Groundwater Conflicts in the South Platte” by Veronica A. Sperling and Steven O. Sims. Veronica A. Sperling is also a partner at Moses, Wittemyer, Harrison and Woodruff PC, while Steven O. Sims is the Senior Water Counsel for the Colorado Attorney General's Office.



TAKINGS, WATER RIGHTS & THE 5TH AMENDMENT



EMERGING JURISPRUDENCE

by Michael J. Van Zandt, Partner

McQuaid, Bedford & Van Zandt LLP (San Francisco, California)

INTRODUCTION

The United States Constitution does not prohibit the taking of property for public purposes. Rather, the Fifth Amendment to the Constitution requires that “just compensation” be paid when property is taken for a public purpose.

The origins of the Takings Clause of the Fifth Amendment arise from the acts of the British government prior to the Revolutionary War in which the British military regularly confiscated private property and goods from the colonists without compensation. Moreover, the Founding Fathers believed that citizens of the newly formed United States of America should enjoy certain inalienable rights, including freedom of speech, freedom of assembly, the right to representation, freedom of religion, the right to bear arms, and the right to own property. Nevertheless, the new government recognized that there were times when the sovereign might need to use property that belonged to a private individual.

To address such a situation, the Founding Fathers devised in the Bill of Rights the right to receive just compensation if the federal government takes private property for a public purpose. The concept of just compensation was borrowed from several of the State Constitutions that contained either a prohibition on the taking of private property or allowed for just compensation.

This article will address how the emerging area of Takings jurisprudence is dealing with the issue of water rights and water resources. Private property owners are now realizing some success in the federal courts on the issue of decisions under the Takings Clause impacting property rights. Courts are for the first time allowing compensation for the taking of water rights by the federal government for public purposes.

THE FIFTH AMENDMENT TAKINGS CLAUSE

The Takings Clause of the Fifth Amendment to the United States Constitution is deceptively simple to have precipitated so much disagreement and so many interpretations. The Clause states: “... [N]or shall private property be taken for public use without just compensation.” It must be recognized that the federal and state governments have the inherent right as a sovereign to condemn property. The right of eminent domain by governmental entities has long been recognized and is not subject to challenge, except under limited circumstances, such as when a governmental entity condemns property for a private purpose not related to governmental activities. The vast majority of condemnation cases deal with overt condemnations where the government condemns the property directly and pays fair market value for the property. The issue in most of these cases is not whether the government can condemn but rather how much must the government pay in compensation.

Inverse condemnation, however, occurs when the government acts as a sovereign to regulate property or physically invades or prevents the use of property and does not pay just compensation. In these cases, the government acting in its sovereign or proprietary capacity has the ability to affect private property rights without paying just compensation. The US Congress has placed jurisdiction over takings cases, with claims of \$10,000 or more against the United States, with the US Court of Federal Claims. 28 U.S.C. § 1491. Takings cases against states must be filed in the appropriate state, given the Eleventh Amendment protections.

Modern Takings jurisprudence begins with *Pennsylvania Coal Co. v Mahon*, 260 U.S. 393 (1922). That case is often referred to for the rule that government may regulate private property but if the regulation goes “too far,” then the regulations may effect a taking. Following that case, there have been a labyrinth of decisions that one must understand in order to decide if government has caused a taking. The decisions are complex and in some cases convoluted and each one seemingly turns on its unique facts.

To simplify things as much as possible, there are two basic kinds of Takings cases. First, there are regulatory takings, as referred to in *Pennsylvania Coal*. Second, there are physical takings, as referred to in *Loretto v. TelePrompeter Manhattan CATV Corp.*, 458 U.S. 419 (1982). The determination of whether a particular taking is a physical or a regulatory one is fairly straight forward but is also one of the issues most litigated by the United States. Therefore, it is important, especially where water rights are involved, to analyze each situation in order to determine the appropriate takings analysis that must be applied.

Origins

Public Purpose

Inverse Condemnation

“Too Far”

<p>Takings</p> <p>Government Purpose</p> <p>Expectations</p> <p>Economic Value</p> <p>Nolan Nexus</p> <p>Lucas</p> <p>Barrier to Use</p> <p>Water Rights</p>
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REGULATORY TAKINGS

The analysis of a regulatory taking is based upon the US Supreme Court’s decision in *Penn Central Transportation Co. v. New York City*, 438 U.S. 825 (1978). That Court determined there were three distinct questions that must be addressed: (1) the nature of the government action; (2) the investment backed expectations of the property owner; and (3) the economic impact of the action. The court will first inquire whether the actions by the government are related to a legitimate government purpose such as flood control, national defense, interstate commerce, etc. Assuming that the nature of the governmental action “substantially advances a legitimate government purpose,” the next inquiry by the court in a regulatory takings case is whether the investment backed expectations of the property owner are reasonable. For example, if the regulation existed at the time the property was acquired and the property owner knew or should have known about the regulation, then it would not be reasonable for the property owner to expect the regulation would not affect his or her property. See *Palazzolo v. Rhode Island*, 553 U.S. 606, 63236 (2001) (O’Connor, J., concurring). Finally, the court must inquire into whether the government’s action destroyed economic value of the property. This is a fact intensive inquiry that requires a detailed economic analysis of the use of the property and whether there is any economic value remaining after the regulation. For example, a bookseller who is not permitted to sell pornography can still sell other books and may not have the entire value of the book store destroyed by the regulation.

In recent years, the Supreme Court has provided guidance on certain types of governmental regulations that cause per se takings of property (regulations or physical activities that by their existence result in the taking). In *Nolan v. California Coastal Commission*, 483 U.S. 825, 836-839 (1987), the Court held that a regulatory scheme that impacts property rights must substantially advance the governmental scheme or else it is a taking. In *Nolan*, the Coastal Commission required access to the beach from the Nolans’ property to address the “psychological barrier” the line of private properties provided to public access. The Court determined that there was no nexus between the goal of public access and the psychological barrier that was being prevented and found that such a condition was a taking. In other words, the Court found that public access did not remedy the psychological barrier and, therefore, there was no nexus between the regulatory scheme and the condition the Commission was seeking to impose.

Another type of per se taking occurs when the actions of the government result in a destruction of all productive and beneficial uses of the property. In *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003 (1992), the inquiry was whether the government’s action prevented Mr. Lucas from building his home along the coast of South Carolina. Concluding that the actions of the state prevented the property owner from enjoying any beneficial use of his property, the Court held that there was a per se taking of the property.

PHYSICAL TAKINGS

A physical taking occurs when the governmental action intrudes upon the property or it presents a barrier to the use of the property. In *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 435-436 (1982), the Court found that the placement of a small cable TV box on the outside of an apartment house constituted a physical taking. The Court reasoned that government action that is a permanent physical occupation of property is a taking regardless of whether the action achieves an important public benefit or has only minimal economic impact on the owner. The analysis of a physical takings case is based upon whether the intrusion by the government is “so immediate and direct as to subtract from the owner’s full enjoyment of the property and to limit his exploitation of it.” *U.S. v. Causby*, 328 U.S. 256, 265 (1946). In *Causby*, the Court ruled that frequent flights of aircraft over a landowner’s property constituted a physical invasion and taking of the property. Likewise in *Hendler v. U.S.*, 952 F.2d 1364 (Fed. Cir. 1991), the Federal Circuit Court of Appeals decided that a physical intrusion by the US Environmental Protection Agency onto Mr. Hendler’s property to drill monitoring wells amounted to a physical invasion and taking of his property, despite the need to site the wells in order to monitor groundwater contamination migration from an adjacent property. Thus, physical intrusion that interferes with the full enjoyment of use of property is a per se taking of property.

HAGE V. UNITED STATES

A case pending in the US Court of Federal Claims since 1991 is illustrative of how interference with water rights by the federal government can rise to the level of a physical taking. Like the aircraft over-flight cases, if the government action prevents the use and enjoyment of the property, then a taking occurs. The Hages own a large cattle ranch in central Nevada, with over 7000 acres of deeded land and

Takings

Grazing Rights

"1866 Act"

Competing Uses

Contact Water Rights

US Defenses

Purpose of Contract

more than 750,000 acres of federally administered grazing allotments. In *Hage*, the federal agencies suspended and then terminated the Hages' rights to graze cattle on lands that the Hages and their predecessors in interest had grazed since the 1860s. *Hage v. U.S.*, 35 Fed. Cl. 147 (1996). Under the Mining Act of 1866 (43 U.S.C. § 661), the Hages and their predecessors had confirmed to them by the US Congress certain water rights, ditch rights of way, access rights and range rights that were recognized under local law and custom. The Court of Federal Claims found that these rights were property rights for which just compensation must be paid if the government has taken them. *Hage v. U.S.*, 51 Fed. Cl. 570 (2002). See Moon, TWR #4, pp.1719, regarding Takings and 1866 Mining Act easements.

The trial on the takings issue was held in May of this year. Evidence presented at the trial demonstrated that the federal agencies were managing the federal grazing allotments primarily for purposes other than cattle grazing. In fact, the federal agencies had converted the allotments into areas for wildlife protection, for the protection of riparian resources, for recreation, for hunting and for wilderness areas. These competing uses interfered with the use of the area for cattle grazing and caused the government to curtail and then eliminate grazing as one of the uses for the area. The effect was that the Hages were denied the use of their water rights, their range improvements, their ditch rights of way, their forage and their other range rights. Simply put, the Hages were prevented from accessing and placing to beneficial use the property rights that had been confirmed to them by the Congress. The government contends that it has the right to terminate the Hages' rights in order to protect the range resources. The US Court of Federal Claims will hear closing arguments in the case in October of 2004. The court will then decide on both the takings issue and damages, if a taking is found. The potential range of damages is between \$12 million and \$30 million.

TULARE LAKE BASIN DECISION

The most recent and most significant case to address the issue of whether the interference with water rights and water resources is *Tulare Lake Basin Water Storage District v. United States*, 49 Fed. Cl. 313 (2001). The case involved the shutting off of pumps that would divert water from the Sacramento San Joaquin Delta to the Central Valley Project (CVP) in California. Plaintiffs in the case had contractual rights to the use of the water from the Bureau of Reclamation (BOR). The National Marine Fisheries Service (NMFS) began discussions with BOR on the impacts of the CVP on the winter-run chinook salmon, an endangered species. As a result of those discussions, NMFS issued a biological opinion that the proposed operation of the State Water Project (SWP) and the CVP would jeopardize the salmon. Reasonable and prudent measures were developed that would restrict the timing and manner of pumping water out of the Delta. Thus, water that would otherwise be available for diversion by the water users was made unavailable. The Tulare Lake Basin Water District and others then sued in the Court of Federal Claims for a taking of their contractual water rights.

The United States raised three separate defenses to the alleged taking. First, the government argued that the actions of BOR merely frustrated the contract's purpose and did not effect a taking. Second, it argued that the taking, if it did occur, must be analyzed as a regulatory taking, and since that analysis requires the existence of reasonable investment backed expectations and a significant decrease in economic value, no taking occurred. Finally, the United States contended that it could not be held liable for a taking when it does no more than impose a limit on plaintiffs' title that background principles of state law would otherwise require.

The court addressed each of these arguments in turn. First, the court distinguished the *Tulare Lake* situation from one where the mere purpose of a contract is frustrated. The court analyzed the case of *Omnia Commercial Co. v. United States*, 261 U.S. 502 (1923). In that case, there was a contract between Omnia and Allegheny Steel for the purchase of a large quantity of steel plate. The government requisitioned the entire production of steel plate for the year and Omnia sued. The Supreme Court denied Omnia's claim because the contract had been merely ended rather than appropriated. The Court reached its decision in *Omnia* because the Fifth Amendment "has always been understood as referring only to a direct appropriation, and not to consequential injuries resulting from the exercise of lawful power." 261 U.S. at 510. The Court distinguished between the obligation to perform under the contract and the subject matter of the contract. Thus, if the government had stepped into the shoes of Omnia under its contract, there might have been a taking, but the government only appropriated the subject matter of the contract, to which Omnia did not have title to until the steel was delivered.

The United States argues in *Tulare Lake* that its action served only to frustrate the contract since the government did not substitute itself as a contracting party, nor did it assume any (*Omnia*) rights under the contract. The *Tulare Lake* court disagreed. The court stated that *Omnia's* distinction between a contract

<p>Takings</p>	<p>that has been appropriated and one that has been merely frustrated is relevant only where the contract right that is claimed remains separate and distinct from the subject matter of the contract. In other words, <i>Omnia</i> addresses the situation where the party claims a contract right to the property but cannot claim ownership of the property itself, since title has not yet passed.</p>
<p>Right to Use</p>	<p>The court in <i>Tulare Lake</i> determined that the situation with the CVP was not the same as the steel plate contract. The court found that the plaintiffs who had contracted for water in the CVP had an identifiable interest in a stipulated volume of water. The right to the use of the water had, in fact, been transferred to the end users, even though the state remained the legal title holder to the water itself.</p>
<p>Physical Taking</p>	<p>The court then addressed whether the action by the government was a regulatory or a physical taking. The United States asserted that the actions of the government were merely restrictive and therefore the more exacting analysis under a regulatory takings analysis must be applied. The framework for the analysis of which law applies is based upon whether the intrusion by the government is “so immediate and direct as to subtract from the owner’s full enjoyment of the property and to limit his exploitation of it.” <i>U.S. v. Causby</i>, 328 U.S. 256, 265 (1946). In <i>Causby</i>, the Court ruled that frequent flights of aircraft over a landowner’s property constituted a physical invasion and taking of the property. The <i>Tulare Lake</i> court saw the elimination of the pumping of the water for the protection of endangered species as “exclusive possession of plaintiffs’ water-use rights for preservation of the fish.” <i>Tulare Lake</i>, 49 Fed. Cl at 319. Thus the court concluded that the prevention of the use of the water by the government, to which they would otherwise be entitled, rendered the usufructary right to the water valueless. Water rights are generally viewed as “usufructary” rights, i.e. the owner of a water right is entitled to the use of the water, even though the state is considered to be the owner of the water resource itself.</p>
<p>Public Trust Doctrine</p>	<p>The government next argued that it has no liability because plaintiffs’ contracts only entitle them to water made available to the California Department of Water Resources (DWR) and since no water was made available to DWR through no fault of its own, plaintiffs have no claim to the foregone flows. Further, the government argued that plaintiffs’ contractual rights were limited by the public trust doctrine, the doctrine of reasonable use and common law principles of nuisance, all of which provide for the protection of fish and wildlife. The reductions, therefore, merely reflect the limitations of title inherent in the background principles of state law.</p>
<p>Contract Language</p>	<p>The court distinguished the contract language limitations by noting that the limitations in the contract with DWR applied to actions by DWR and not the federal government. The United States cited <i>O’Neill v. United States</i>, 50 F.3d 677 (9th Cir. 1995), wherein the plaintiffs sued under a breach of contract theory against the United States. In that case, the court held that restrictions on liability that applied directly to the United States prevented a breach of contract claim. However, since the contract limitation in <i>Tulare Lake</i> applied to the DWR and not the BOR, no such contractual limitation of liability applied here.</p>
<p>Nuisance</p>	<p>Next the court addressed the issues of the public trust doctrine, the reasonable use doctrine and nuisance. The court noted that the State Water Resources Control Board set the allocations to the plaintiffs in an order of the board. That order does not call for the adjustment of the allocations based on the need to protect fish or wildlife. The defendants urged the court to consider that if the issue were before the state, it would determine that plaintiffs’ use of the water was unreasonable and therefore unlawful to the extent that it endangers the fish.</p>
<p>State’s Judgement</p>	<p>The Court of Federal Claims analyzed the situation and determined that it could not for the first time make California law with regard to whether the diversion of the water in question would be unreasonable or constitute a nuisance under state law. Defendants cited <i>Rith Energy, Inc. v. United States</i>, 44 Fed. Cl. 108 (1999), wherein the court decided that background principles of state law did not allow as part of the property right the right to pollute groundwater. Moreover, in <i>Rith Energy</i> there had been an adjudication before the Department of Interior’s Office of Hearing and Appeals that plaintiff’s proposed activity would pollute groundwater. The background principles of the state law in question would not allow the pollution of groundwater in that manner. Therefore, there could be no taking for a property right that was constrained by such background principles.</p> <p>However, the court in <i>Tulare Lake</i> found that there had been no corresponding determinations by either the state or by the federal government that the actions of the water districts and farmers in diverting water to the CVP would violate state law as a nuisance or be considered as unreasonable. The court noted that the actions of the plaintiffs had been authorized by the state and any change in that determination would be an impermissible intrusion by the court into an area reserved for the state’s judgment. Further, the public trust and reasonable use doctrines include a complex balancing of interests, requiring an exercise of discretion that the court refused to exercise.</p> <p>The court found that the decision to curtail pumping of the water amounted to a physical taking of property for the endangered species for which just compensation was due.</p>

Takings

CONCLUSION

Cases dealing with the takings of water rights are sparse. Cases such as *Tulare Lake* and *Hage* are important to the development of Takings jurisprudence because they give guidance to the federal agencies and to water right owners of how the courts will treat such rights, both in the manner of analysis of the taking itself and the quantification and valuation of those rights. There are still many unanswered questions and unaddressed issues. Nonetheless, the case law is shaping up and water right owners can take solace that so far the courts are recognizing these valuable rights and the impacts the federal Endangered Species Act and other federal government actions have on their use.

FOR ADDITIONAL INFORMATION:

MICHAEL VAN ZANDT, McQuaid Bedford & Van Zandt LLP, 415/ 905-0200 or email: mvanzandt@mbvz.com

Michael J. Van Zandt is a partner with the law firm of McQuaid Bedford & Van Zandt LLP in San Francisco and practices in the areas of Fifth Amendment Takings, environmental, natural resources and land use law. He is one of the attorneys representing the plaintiffs in *Hage v. U.S* before the US Court of Federal Claims.

Editor's Note: Another takings case was recently filed on behalf of two San Yoaquin County water districts against the US Bureau of Reclamation seeking \$500 million for a taking of their contracted water supply. See *Stockton East Water District, et al v. United States*, US Court of Federal Claims, No. 04541L (filed April 20, 2004).

FOR INFORMATION ON THIS CASE: JENNIFER SPALETTA (Herum Crabtree Brown), counsel for Stockton East Water District, 209/ 4727700 x130, email: jspaletta@herumcrabtree.com

WATER BRIEFS

MISSOURI RIVER APPEAL REGION

Conservationists announced they will appeal the district court's approval, on June 21, of the Bush administration's management plan for the Missouri River (National Wildlife Federation, American Rivers, Environmental Defense, Izaak Walton League, Environmental Defense and others). Some of the groups will also challenge the finding that the US Army Corps of Engineers (Corps) has satisfied its obligation to create new wildlife habitat along the lower river. *In Re Operation of the Missouri River System Litigation*, 03-MD-1555 (PAM), (D. Minn. 2004). See Hayes/Schneider/ Sturkie, TWR #4 and Water Briefs, TWR #5.

Judge Magnuson's ruling in the consolidated case upheld the principle that the Corps must abide by recommendations from federal wildlife scientists as it operates the Missouri River dam system. On appeal, conservationists will ask the 8th Circuit Court of Appeals to rule that a Biological Opinion issued by USFWS in 2003 is not a lawful replacement for the original Missouri River Biological Opinion, released in 2000.

Conservationists sharply question the validity of the amended 2003 Biological Opinion. Their objections include assertions that State agencies along the river have testified that no new scientific information is available that warrants revising the original opinion; the team that wrote the previous document was largely replaced by scientists inexperienced with Missouri River endangered species at the direction of political appointees in the Department of the Interior; the amendments were prepared in just three weeks and finalized immediately without public hearings or scientific peer review; the amended opinion drops the finding that dam operations increase the risk of extinction for the piping plover and least tern, and relies mostly on habitat creation rather than dam operation modification to prevent extinction of the pallid sturgeon; and the amended opinion provides flow modifications that are insufficient to increase the appeal of the river and reservoir for recreational use and associated economic activity.

Some of the groups also signaled their intention to return to Judge Magnuson's courtroom to challenge the USFWS's finding that the Corps successfully created the 1200 acres of wildlife habitat that it wishes to substitute for lower summer flows. On June 21st, Judge Magnuson indicated it was too early to rule on this facet of the case. The groups maintain that because the wildlife service certified the new habitat over the objections of its field scientists, it does not meet the ESA's standards for science-based decisions. "The fingerprints on the document approving these 1200 acres of purported habitat are not those of the scientists that inspected it," said Rebecca R. Wodder, president of American Rivers. "This doesn't live up to the spirit of the law and we will ask the court to rule that it doesn't satisfy the letter of it, either."

For info: David Hayes (Latham & Watkins), 202/ 637-2200; Brian O'Neill (Faegre & Benson), 612/ 766-7000

WATER BRIEFS

TRINITY RIVER

CA/OR

9TH CIRCUIT DECISION

In a decision directly impacting California and Oregon water issues in the Klamath Basin, the 9th Circuit Court of Appeals issued an opinion concerning the Trinity River flow regime. The 9th Circuit reversed all but one of the trial court's rulings regarding restoration of the Trinity River and flows required for the river. California municipal water agencies and power districts (plaintiffs) challenged the plan to redirect Trinity River water, arguing that the procedural requirements of the National Environmental Policy Act, 42 U.S.C. § 4321 et seq. (1970) (NEPA), and the Endangered Species Act, 16 U.S.C. § 1531 et seq. (1973) (ESA), were not met. The 9th Circuit concluded that "nothing remains to prevent the full implementation of the ROD, including its complete flow plan for the Trinity River." *Westlands Water Dist. v. Hoopa Valley Tribe*, No. 03-15194, Slip Op. 9201 (July 13, 2004).

In each year since the Record of Decision (ROD) was signed in 2000, water releases to the Trinity River have been set by the federal courts. In 2001, federal district court Judge Oliver Wanger ruled that the Interior Department had to prepare a new Environmental Impact Statement on the restoration work's effect, but he permitted the critically dry water amount (369,000 acre-feet) to be released, which was appropriate under the ROD for that very dry year. In December 2002, Judge Wanger issued a Memorandum Decision and Order ruling that the Interior Department violated two environmental laws when it issued the 2000 Record of Decision (ROD) and directed that a revised Environmental Impact Statement be prepared. The Hoopa Valley Tribe appealed. The Tribe earlier in 2002 filed a motion to modify the preliminary injunction that governed flows during the appeal and the Court authorized release of 468,000 acre-feet of water for the Trinity River. In 2003, the Court authorized the Department to retain 453,000 acre-feet of water for the Trinity River, plus use an additional 50,000 acre-feet if necessary for late summer conditions. In 2004, the 9th Circuit Court of Appeals granted the Hoopa Valley Tribe's request to use 647,000 AF (the normal year volume) for water releases to the Trinity River (see Water Briefs, TWR #3).

The recent 9th Circuit decision held that no Supplemental EIS (SEIS) is needed; that the purpose and need statement and the range of alternatives examined in the 2000 FEIS were adequate; and that the use of power plant bypasses for temperature control was fully examined. The court further found that the ROD's effect on California's energy reliability was insignificant and did not require supplementation. The court upheld the lower court's ruling that Fish and Wildlife's Biological Opinion Reasonable Prudent Measure (RPM) which limited movement of the X2 point in the Bay Delta (measurement of salinity/ measured in miles from the Golden Gate Bridge) and NMFS' RPM which required immediate implementation of ROD flows were invalid because they required major changes in the proposed restoration action. Those RPM are unenforceable but the Biological Opinions are otherwise valid.

In its conclusion, the 9th Circuit explained its' decision by noting that the "number and length of the studies on the Trinity River, including the EIS, are staggering and bear evidence of the years of thorough scrutiny given by the federal agencies to the question of how best to rehabilitate the Trinity River fishery without unduly compromising the interests of others who have claim on Trinity River water." *Westlands Water Dist.* at 9201.

Tom Schlosser, counsel for the Hoopa Valley Tribe, told TWR that the lower court judge enjoined portions of the flow regime and never did enjoin the remainder of the restoration requirements contained in the Trinity River ROD. Schlosser said "the Bureau of Reclamation has been dragging its feet on the other restoration requirements. For example, they are required to grade down steep river banks at different sites as part of the restoration effort. They were supposed to complete work on 24 sites by this year, but so far have not done any and have only scheduled one site to be completed this year." Since the "9th Circuit's holding only helps us get 47% of the flow of the river, important restoration work in the Trinity remains if restoration is to succeed." As a portent of future action, Schlosser went on to say that the Hoopa Valley Tribe "remains very concerned" about the lack of attention the Bureau is giving to its restoration requirements."

For info: Tom Schlosser (Morisset Schlosser, et al), 206/ 386-5200; 9th Circuit decision and additional decisions/information, see website: www.schlosserlawfiles.com/TrinityRiver/CVInterests071204.htm

DESALINATION WORKSHOPS CA

\$50 MILLION PROGRAM

The Department of Water Resources (DWR) will hold two workshops to inform interested parties about the 2004 Water Desalination Draft Proposal Solicitation Package and to request public comments on the PSP. This grant program implements Chapter 6(a) of Proposition 50 (the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002), which authorizes the California DWR to administer a \$50 million desalination program. The program provides grants for construction projects as well as research and development, feasibility studies, pilot, and demonstration projects. This grant program aims to assist with the development of local water supplies through brackish water and seawater desalination. Written comments are due by August 23 and should be directed to Fawzi Karajeh, Office of Water Use Efficiency, California DWR, P.O. Box 942836, Sacramento, CA 94236-0001 or to fkarajeh@water.ca.gov. One workshop was held in Sacramento on August 12 and a second workshop is scheduled for Long Beach on August 17 from 10am-12pm (see TWR Calendar).

For info: The Draft PSP is available for review at www.owue.water.ca.gov/finance/

WATER BRIEFS

SUMMER SPILLS CONTROVERSY

OR/WA/ID/MT

9TH CIRCUIT APPEAL

On July 27th, a federal court squelched US. Army Corps of Engineers (Corps) and Bonneville Power Administration (BPA) plans to curtail a federally required salmon-protection provision to spill water over dams on the Columbia and Snake Rivers. US District Judge James Redden granted a preliminary injunction requested by the Confederated Tribes of the Umatilla Indian Reservation and others, calling the summer spill plan “arbitrary and capricious.” The ruling requires the Corps and BPA to maintain the spill schedule outlined by the Federal Salmon Plan, which remains in force by court order until a new plan reaches completion. A draft plan is due August 30. See Water Briefs, TWR #3 and #5.

BPA had received NOAA Fisheries approval to reduce spill in August at the Ice Harbor and John Day dams on the Snake River and the Bonneville and The Dalles dam on the Columbia River. Governor Ted Kulongoski of Oregon was the only governor who weighed in against the BPA spill proposal, filing an amicus brief in the US District Court opposing the action. The brief included assertions that BPA was essentially double-counting some offset measures: “The flow augmentation from Brownlee cannot ‘offset’ the spill curtailment, because that flow augmentation already was taken into account as part of the proposed action in the 2000 Biological Opinion. The double-counting of Brownlee summer flow is arbitrary and capricious.”

BPA responded almost immediately to the decision, asking the US Department of Justice to file an appeal with the 9th Circuit Court of Appeals to request a stay of the injunction. Ed Mosey, Chief Press Officer for BPA, told TWR that the Corps and BPA “contend that the case made and the evidence presented by those agencies [to the judge] to justify the proposed reduction in summer spills was accurate and reflected river conditions.” BPA/Corp are asserting that “the judge didn’t correctly interpret the information presented to him. For example, the judge found that the release of water from Brownlee Reservoir would not be ‘new’ water offsetting the spill reductions. We contend that Brownlee water is new.” Mosey went on to explain their position: “Was the judge’s interpretation of the facts correct? We are asking the 9th Circuit to review the injunction on this basis.” The Corp and BPA are hoping for a ruling from the 9th Circuit within two weeks, since much more of a delay will basically moot the questions about August spills. “BPA asked for the spill reductions as a test for this year only, so we are requesting that the injunction be stayed pending a ruling on the merits,” Mosey said.

In a related press release dated July 30th, the Corps acknowledged that it has identified a discrepancy in the amount of water spilled at Bonneville Dam, causing less water to be released than reported. Engineers say that due to incorrectly calibrated gate openings, when trying to meet targeted volumes up to 30 percent less water has been spilled from the dam’s spillway than has been reported to regional fish and water management officials. Cindy Henriksen, chief of the Corps’ Reservoir Control Center in Portland, said the size of the discrepancy was exacerbated in recent years as a result of new spill patterns used for fish passage at Bonneville Dam. Prior to 2002, the Corps spilled the majority of the water from the left- and right-most gates on the spillway through wider gate openings. However, following the installation of submerged flow deflectors designed to reduce saturated gas levels, which allows for better conditions for fish, the Corps changed its water releases to go through all 18 gate openings. That means smaller openings in each gate and larger margins for error. Henriksen said the Corps this week thought it was releasing 75,000 cubic feet per second of water over the spillway, when it was actually releasing closer to 64,000 cfs. Nighttime spills for juvenile fish are not affected by this problem, she noted. In addition to recalibrating the gates at Bonneville Dam immediately, the Corps will be looking at all its dams in the Columbia and Snake river system. The Corps is in the process of validating the data at Bonneville Dam, a process will take about two weeks.

Another entity has entered the fray over the summer spill proposal. The Columbia Snake River Irrigators Association has filed an emergency motion in the 9th Circuit Court of Appeals asking that Judge Redden’s preliminary injunction halting the BPA spill plan be vacated. The motion also requests that Judge Redden be removed from further involvement in the ongoing litigation concerning the amendment of the 2000 Biological Opinion for the Columbia River.

For info: Ed Mosey (BPA), 503/ 230-5359, email: efmosey@bpa.gov or Mike Hansen (BPA) BPA (503)-230-5131; Rick George (CTUIR), 541/ 276-3449, email: rickgeorge@ctuir.com, website: www.umatilla.nsn.us

MONTANA/WYOMING UPDATE

MT/WY

TWR spoke with Sue Lowry, Director of Policy and Administration in the Wyoming State Engineer’s Office, regarding discussions between Montana and Wyoming concerning the Yellowstone River Compact (see Water Briefs, TWR #4 and #5). Lowry said that Patrick Tyrrell, Wyoming State Engineer, and Jack Stults, Montana’s Administrator of the Water Resources Division (DNRC), in a telephone conference call on July 28th agreed that both states would provide detailed technical information to each other detailing water uses in the states. That decision puts the discussion back into the hands of the state’s respective technical leaders, Sue Lowry of Wyoming and Rich Moy, Chief of Montana’s water management bureau. Lowry informed TWR that the states will continue discussing Compact issues, but that any resolution in this water year is unlikely.

For info: Sue Lowry (State Engineer’s Office), 307/ 777-5927; Rich Moy (DNRC), 406/ 444-6633, email: rmoy@state.mt.us

WATER BRIEFS

EPA PESTICIDE POLICY US
ESA CONSULTATIONS

New consultation procedures were finalized on July 29th by NOAA Fisheries and the US Fish and Wildlife Service (USFWS) to provide alternative Endangered Species Act consultation processes for Environmental Protection Agency's approvals of pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). According to administration officials, these regulations are designed to streamline the consultation process and provide flexibility in the ways that EPA meets its obligations under the ESA. The new procedures were developed in reaction to the *Washington Toxics Coalition v. EPA* case, and the US District Court's and 9th Circuit Court's rulings in favor of the Coalition. Those rulings included orders establishing no-spray buffers for salmon bearing streams during the pendency of the case's appeal (See Beale, TWR #4 and Water Briefs, TWR #5).

The new rules allow EPA to make an initial determination of whether a pesticide is "likely to adversely affect" any federally-protected threatened and endangered species or critical habitat. If EPA determines an impact is likely, formal consultation will occur; if no impact is likely, no further Section 7 ESA consultation is required.

Meanwhile on July 26th, conservation and fishing groups represented by EarthJustice sent EPA a 60-day Notice of Intent to Sue letter, alleging that EPA rubber-stamped its approval of a number of pesticides that threaten salmon populations to avoid meeting the consultation requirements of Judge Coughenour's order in the *Washington Toxics* case. The groups also are not supportive of the new counterpart regulations, referring to the new regulations as an EPA proposal "to assume near-complete responsibility for assessment of pesticide impacts, despite its dismal track record and complete lack of knowledge of the biologic aspects of species needing protection."

For info: Jim Lecky, NOAA Fisher-

ies' acting Senior Advisor for Intergovernmental Programs, 301/ 713-2239, or USFWS website: <http://endangered.fws.gov/consultation/index.html>; Patti Goldman (EarthJustice) 206/ 343-7340 x32; Erika Schreder, Washington Toxics Coalition, 206/ 632-1545 x19

RECLAIMED WATER USE WA
GW RECHARGE

The city of Quincy has been awarded a \$3.6 million low-interest loan from the Department of Ecology (Ecology) to refinance the town's new wastewater treatment facility that reclaims and re-uses water. Reclaimed water is wastewater that is treated to a level that allows it to be used for some types of irrigation, commerce and industry and to recharge underground water sources. Washington's Reclaimed Water Use Act was passed by the legislature in 1993. "The law recognized that we have new, modern technology and processes that prevent wasting water at a time when the state hasn't a drop to spare," said David Peeler, who manages the state's water-quality program.

The money comes from the Washington State Water Pollution Control Revolving Fund, authorized under the federal Clean Water Act. It is loaned to small governments to improve water quality. In Quincy, the money will be used to refinance the wastewater reclamation plant that treats wastewater to very high standards of cleanliness before using it to recharge groundwater supplies. The original loan came from Earth Tech Inc., which built and operates the facility. This fiscal year, Ecology offered \$8.3 million for high-priority water-quality projects across the state. Local governments actually requested about \$230 million. Some of these needs are being met with other funding sources.

For info: Jani Gilbert, public information manager, 509-329-3495; Ecology website: www.ecy.wa.gov

MOBIL OIL SPILLS UT
NAVAJO NATION SETTLES

The US Environmental Protection Agency (EPA) and the Department of Justice today announced a settlement with Mobil Exploration and Producing U.S. Inc. worth over \$5.5 million for numerous oil and produced water spills from its oil production activities on the Navajo Nation in southeastern Utah. The settlement includes a \$515,000 penalty and requires the company to spend about \$4.7 million on field operation improvements to reduce spill incidences.

Mobil will also spend approximately \$327,000 on environmental projects that include sanitation facilities and construction of a drinking water supply line extension that will provide running water to 17 of the remote residences located on the oil production fields. Currently, local residents may drive as long as an hour to fill 55 gallon drums with drinking water.

In March 1998, the EPA and the Department of Justice filed a lawsuit claiming that between December 1991 and March 1999 approximately 83 spills at Mobil's oil fields reached tributaries of the San Juan River, violating the federal Clean Water Act. Mobil's violations include: 1) unauthorized discharge of oil and oil and water mixtures into tributaries of the San Juan River; 2) failure to prepare and fully implement an adequate spill prevention and control plan; 3) failure to implement existing plans; 4) failure to prepare a facility response plan or conduct drills and training; and 5) failure to notify the EPA of discharge events

Mobil's oil production fields are located on both sides of the San Juan River in southeast Utah on lands leased from the Navajo Nation. The EPA worked closely with the Navajo Nation Environmental Protection Agency in addressing the spills, which the Navajo Nation EPA first brought to the US EPA's attention in 1996.

For info: Wendy L. Chavez (EPA), (415) 947-4248

**HYDRO FISH PASSAGE OR
DESCHUTES RIVER**

Salmon and steelhead will migrate past a large series of dams for the first time since 1968, potentially reopening 226 miles of streams above the dams to fish migration, under the terms of an historic multiparty agreement. A total of 22 organizations and government agencies, including the project owners, endorsed the agreement. Secretary of the Interior Gale Norton announced the agreement at a ceremony in Warm Springs, Oregon on July 13th. The pact is one of the final steps in obtaining a new federal license for Pelton Round Butte, the only hydroelectric project in the US jointly owned by a Native American tribe and a utility. The 465-million watt project is one-third owned by the Confederated Tribes of the Warm Springs (CTWS) and the remainder owned by Portland General Electric (PGE). The 20-mile long complex impounds the Deschutes River, a federal Wild and Scenic River and a tributary of the Columbia. The three dams, rising to as high as 440 feet, blocked salmon and steelhead migration in the Deschutes, Metolius and Crooked Rivers above the project 36 years ago. Although it was originally constructed with fish passage facilities, the downstream system failed.

The solution will be a 270-foot high underwater tower arising from the bottom of the lake behind Round Butte Dam. A 130-foot wide disc at the top of the tower will draw in most of the surface water, turning the currents and fish back downstream toward the dam. Fish will be screened at the intake and trucked downstream of the dams for release on their journey to the Pacific. The tower will also blend waters from various depths to improve the conditions, including water temperatures, for downstream fish. Species to be reintroduced above the dams include summer steelhead (a federally listed threatened species) and spring Chinook salmon. Resident kokanee (currently land-locked) should naturally convert to sockeye salmon as

they head downstream.

PGE and the Tribes are prepared to spend more than \$135 million dollars on the project during the 50-year term of the license, the vast majority going to fish-related measures. More than \$21 million is planned for fish habitat improvement on Deschutes River tributaries, including water rights acquisition. The Federal Energy Regulatory Commission is expected to act on the new license in late 2004 or early 2005.

For info:

Mark Fryburg, PGE, 503/ 464-8444
website: www.PortlandGeneral.com/PeltonRoundButte
Bill Rhoades, CTWS, 541/ 553-2013
website: www.warmsprings.com
Frank Quimby, DOI, 202/ 208-7291

WATER BANKS ANALYSIS**WESTERN STATES**

Washington's Department of Ecology has issued a new report entitled "Analysis of Water Banks in the Western States" which is now available online. The report provides an analysis of water banking legislation, policies, and programs in 12 Western states. A primary purpose of the review is to identify banking programs and structures that promote and enhance environmental trades. The analysis examines each state individually beginning with the legislative history of the development of the banking programs. In addition, the review provides a detailed description of banking rules and level of activity. The review of water banking programs includes the characteristics that influence program participation and an assessment of program pricing structures and transaction contracts. The analysis generated a set of questions that should be addressed, and guidelines to consider, when establishing a water bank. The states reviewed are Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah, Washington, and Wyoming.

For info: Ecology website at www.ecy.wa.gov/programs/wr/instream-flows/wtrbank.html

**NAVAJO SETTLEMENT NM
SAN JUAN RIVER BASIN**

A revised draft of a proposed water rights settlement between the Navajo Nation and the State of New Mexico was made available for public inspection July 9. Officials of the Navajo Nation, the State of New Mexico, and the federal government will be reviewing the revised draft documents during the upcoming month. The New Mexico Congressional delegation also will be reviewing the revised draft settlement. The Navajo Nation will be considering the revised proposed settlement through its approval processes beginning next week. The New Mexico Interstate Stream Commission will consider the proposed settlement for approval at a meeting August 18 in Farmington (see TWR Calendar). Changes to the proposed settlement have been made in response to public comments received on an earlier version of the settlement released in December 2003.

The proposed settlement agreement is intended to adjudicate the Navajo Nation's water rights and provide associated water development projects for the benefit of the Navajo Nation, in exchange for a release of claims to water that could potentially displace existing non-Navajo water users in the basin and seriously impact the local economy. "It draws to a close more than 20 years of efforts to adjudicate the Navajo Nation's water rights claims. Importantly for non-Navajo water right owners, it protects existing uses of water, it allows for future growth, and it does so within the amount of water apportioned to New Mexico by the Colorado River Compacts" said State Engineer John D'Antonio.

The proposed settlement includes: a settlement agreement, a partial final decree for entry in the San Juan River Adjudication setting forth the rights of the Navajo Nation to use and administer waters of the San Juan River Basin in New Mexico; a settlement act for Congress to authorize the Navajo-Gallup Water Supply Project to secure a water supply to meet needs of the

WATER BRIEFS

Nation and its members and to approve the settlement agreement; and a contract to provide for deliveries to the Navajo Nation under US Bureau of Reclamation water projects including the Navajo Indian Irrigation Project and the Animas-La Plata Project. Also, the authorization would include facilities to provide municipal water supplies to Gallup and to an area in the southern portion of the Jicarilla Apache Reservation.

The revised proposed settlement agreement and other settlement documents are available at the Office of the State Engineer's website: www.ose.state.nm.us. Also available at the website are related materials, including an executive summary of the revised proposed settlement, a revised depletion schedule indicating how New Mexico's compact water is anticipated to be used over the next 60 years, and a document of responses to the public comments that the Interstate Stream Commission received on the draft version of the settlement.

For info: Karin Stangl, Public Information Officer, 505/ 827-6139, or ISC, 505/ 827-6160

WALLA WALLA TOXICS WA STUDY RELEASED

A draft study report that describes the nature and extent of pesticide and other toxic pollution in the Walla Walla River is ready for public review. The study by the Department of Ecology (Ecology) is the backbone of a water-quality improvement project to reduce pollution in the river.

The study report says that soil erosion is the main way that pesticides reach the river, particularly in Yellowhawk Creek, Dry Creek and Pine Creek. Pesticides such as DDT byproducts and dieldrin bind with soil particles. Besides pesticides, the study also says the highest concentrations of PCBs, or polychlorinated biphenyls, are in the urban areas of the Mill Creek watershed. PCBs had several industrial uses in the past, including as a coolant in electrical transformers. Their manufac-

ture was banned in the U.S. in 1977 because they accumulate in the systems of wildlife and humans and are a probable human carcinogen.

Upper Mill Creek, the upper Walla Walla River at the state line, and the Touchet River consistently had the lowest concentrations of both pesticides and PCBs. The pollution increased substantially in the main stem of the Walla Walla River between the Oregon border and the middle of the river. Ecology researchers studied water, fish tissue and effluent from wastewater-treatment plants from May 2002 through September 2003. The Walla Walla River is on the US Environmental Protection Agency's (EPA) list of rivers and lakes that exceed water-quality limits for certain pollutants. The Clean Water Act requires that Ecology prepare a water-quality improvement plan, sometimes called a total maximum daily load (TMDL). The plan will identify the sources of the pollutants and, with help from the community, specify measures to control the sources in order to bring the river into compliance with clean-water standards..

The public can respond with comments and concerns before August 20. Call 509/ 329-3554 for details. A public workshop will be announced in the near future to discuss the results of the study and describe how the water-quality improvement plan will proceed. **For info:** Jani Gilbert (Ecology), public information manager, 509/ 329-3495; Ecology website: www.ecy.wa.gov; Draft study "...Pesticides and PCBs in the Walla Walla River": www.ecy.wa.gov/biblio/0403032.html

SEWAGE OVERFLOW CA \$2 BILLION SETTLEMENT

In one of the largest sewage cases in US history, the Department of Justice, the Environmental Protection Agency, the Los Angeles Regional Water Quality Control Board, Santa Monica Baykeeper and a coalition of Los Angeles community groups have reached a \$2 billion settlement with the city of Los Angeles

over years of sewage spills. With approximately 6,500 miles of sewer lines serving almost 4 million residents, the city operates the largest sewage collection system in the country. Since 1994, the city has experienced over 4,500 sewage spills. The agreement takes effect when signed by the District Court judge following a 30-day public comment period.

Under the terms of the historic agreement, Los Angeles will rebuild at least 488 miles of sewer lines, clean 2,800 miles of sewers annually, enhance its program to control restaurant grease discharges, increase the sewage system's capacity, and plan for future expansion. The United States and the regional board are settling their civil penalty claims against the city for a total of \$1.6 million, which they will share equally. The city will pay \$800,000 to the U.S. Treasury. The regional board is directing its \$800,000 to local environmental improvement projects that the city will perform.

In total, Los Angeles will perform \$8.5 million in environmental projects in addition to the work required to improve its sewer system. The environmental improvement projects required under the August 6th agreement include projects throughout the city to restore streams and wetlands and to capture and treat polluted storm drain flows. Among the projects under consideration are: North Atwater Creek restoration; South Los Angeles stormwater treatment project; Hazard Creek and wetlands restoration project; Headwork's Spreading Ground wetlands restoration; Legion Lane Park LA River revitalization and habitat restoration; Sycamore Grove stream daylighting; and Cabrillo Beach water quality enhancement project.

The Santa Monica Baykeeper filed its action against Los Angeles in 1998, and the EPA, the Los Angeles Regional Water Quality Control Board and the community groups filed their action in 2001.

For info: Franciso Arcaute, EPA, (213)244-1815

WATER BRIEFS

DAM REMOVAL GRANT US
NOAA/AMERICAN RIVERS

The National Oceanic and Atmospheric Administration (NOAA) and American Rivers announced a \$531,261 grant to renew their joint effort to restore streams and rivers in the Northeast, Mid-Atlantic and California. NOAA is an agency of the US Department of Commerce. American Rivers and the NOAA Restoration Center will kick off the first year of the new three-year partnership by committing to distribute funds to remove barriers to salmon, striped bass, American shad, and other species that migrate between fresh and salt water.

Under their previous three-year agreement, NOAA and American Rivers distributed more than \$1 million to remove 13 unwanted dams, bypass six other dams that will remain in place, replace three culverts, and complete five feasibility studies for future work. Twice a year for the next three years, NOAA and American Rivers will call for new proposals for dam removals and fish passage projects in the three target regions. To be eligible, applicants must secure additional matching funds and detail how their proposed project will benefit migratory fish species.

For info: NOAA's website: www.nmfs.noaa.gov/habitat/restoration.

HATCHERY REFORM N-WEST
NWPCCC SEEKS COMMENTS

Fish hatcheries in the Columbia River Basin need to have clearly defined goals and should be managed carefully to reduce risks to the survival of weak, naturally spawning runs, the Northwest Power and Conservation Council (NWPCCC) recommends in a draft study. NWPCCC recently released for public review and comment its recommendations for policies to guide fish hatcheries in the future. The recommendations seek to improve the integration of hatchery production with

natural production of fish to increase the geographic range and genetic diversity of fish production.

NWPCCC responded to a congressional directive by conducting a scientific review, with the assistance of the Independent Scientific Advisory Board, of the state of artificial production in the Columbia Basin. The Artificial Production Review resulted in a set of recommended guidelines for hatchery practices, ecological interactions and genetics. The Council followed the review with a comprehensive evaluation of all 227 hatcheries and hatchery programs in the basin.

Based on these conclusions, NWPCCC developed three broad, draft recommendations: (1) NWPCCC, NOAA Fisheries, and the Bonneville Power Administration should facilitate a regional discussion that clearly identifies basin-wide goals and priorities for salmon and steelhead. NWPCCC's subbasin planning is an appropriate process to design and implement long-term goals and priorities, and strategies to achieve them. This will reduce disparities among production policies of existing hatcheries; (2) agencies that oversee hatcheries should adopt prioritized criteria to reduce hatchery risk to weak, naturally spawning stocks through techniques such as a) improving broodstock management; b) integrating naturally spawning fish into hatchery broodstocks or reducing excessive straying of hatchery-bred fish; c) improving fish passage; d) preventing disease; and e) improving water quality. Each hatchery should have a plan for future activities based on its genetics management plan and recommendations for fish production developed in the subbasin planning process; and (3) each hatchery should be reviewed periodically to direct changes and assess progress toward goals. After the 30-day public comment period, NWPCCC will finalize its recommendations and submit them to Congress.

For info: Judi Danielson, Chair, 208/334-6970, email: jdanielson@nwcouncil.org; Bruce Suzumoto, Special Projects Manager, 503-222-5161, email: bsuzumoto@nocouncil.org

WETLANDS DAMAGE WA
WSDOT FINED

The Washington State Department of Transportation (WSDOT) and its contractor, Atkinson Construction, must pay \$121,000 to the Washington Department of Ecology (Ecology) for violating conditions set to protect or replace wetlands and sensitive areas on a highway project in eastern King County. The penalty also covers an Ecology order breached by WSDOT and the contractor to halt work in mitigation, buffer or wetland areas. Contractors had damaged or destroyed a total of 1.34 acres without proper authorization. On April 30, Ecology ordered WSDOT and the contractor to stop all work in wetlands and wetland mitigation areas, properly mark them and notify Ecology before resuming work. The contractor worked at two of these locations after the order had been issued without marking them or notifying Ecology.

The US Army Corps and WSDOT have signed a settlement agreement to resolve the violations, which requires that WSDOT: restore the impacted wetlands; perform a project to mitigate for the temporal loss of the impacted wetlands; pay a civil penalty to the US of \$50,000; ensure that the new Project Engineer remains with the project until completion; hire an independent (non-WSDOT employee) environmental inspector who shall remain on the project until the project is complete and shall have increased authority at the job site to direct and stop work; and submit status reports every six months to the Corps detailing the implementation of each recommendation contained in the SR 18 Compliance Investigation report for a period of three years from the date of the Agreement.

For info: Larry Altose (Ecology), 425/649-7009; Patricia Graesser (Corps), 206/764-3760

August 16-17 CA

Dam Removal: Lessons Learned, Berkeley, University of California, Sponsored by The Environmental & Water Resources Institute of ASCE, RE: Various Aspects of Dam Removal, Communication Across Disciplinary Boundaries, Permitting, Economic Impacts, Biological Impacts, Social/Cultural Impacts, Aesthetics/Recreation, and Geomorphologic/Hydrologic Impacts. For info: Katie Gorscak, 703/ 295-6371, or website: www.ewrinstitute.org/damremoval04/california/ca_register.cfm

August 16-17 NM

New Mexico Water Law 12th Annual SuperConference, "Law, Policy and Beyond," Santa Fe, La Fonda on the Plaza, RE: Hydrology, Adjudications, Natural Resource Damage Claims, Economics of Water, Clean Water Act, Proposed Navajo Settlement, Transfers, Acequias and More, Sponsored by the Water Law Institute (CLE Int'l). For info: CLE International, 800/ 873-7130, email: registrar@cle.com, website: www.cle.com

August 17 CA

Desalinization Workshop, Long Beach, Long Beach Water Department 1800 East Wardlow Road, 10am-12pm, RE: California Department of Water Resources workshop about the 2004 Water Desalination Draft Proposal Solicitation Package (see Water Briefs, this TWR on Desalinization)

August 17-18 NM

New Mexico Interstate Stream Commission Meeting, Farmington, Civic Center, 200 West Arrington, 10am-3:30pm, Re: Navajo Nation Settlement Vote, Gila Settlement, New Mexico Water Trust Board for MRG endangered species projects and Elephant Butte Reservoir pilot channel, Middle

Rio Grande Regional Water Plan. For info: Karin Stangl, Public Information Officer, 505/ 827-6139

August 19 TX

Partnerships for Water Infrastructure, Austin, Renaissance Austin Hotel, 9721 Arboretum Blvd., 8am-5pm, RE: Water and Wastewater Infrastructure Needs, Methods for Mobilizing Resources and Meeting Challenges. For info: The National Council for Public-Private Partnerships, 202.467.6800, website: ncppp@ncppp.org

August 20 CO

Colorado Ground Water Commission Meeting, Berthoud, Northern Colorado Water Conservancy District, 220 Water Avenue, 8:30am. For info: Marta Ahrens, 303/ 866-3581, email: marta.ahrens@state.co.us, website: <http://water.state.co.us/cgwc/>

August 25-27 CA

Urban Water Institute's 11th Annual So. California Urban Water Conference, San Diego, Hyatt Regency Islandia. For info: Urban Water Institute, 949/ 679-9676, website: www.urbanwater.com

August 26 CA

State Water Resources Control Board (Cal EPA), Sacramento, 1001 I Street (Coastal Hearing Room), 10am. For info: Debbie Irvin, Clerk, 916/ 341-5600, email: dirvin@swrcb.ca.gov, website: www.swrcb.ca.gov/wksmtgs/schedule.html

August 26-27 CO

Colorado Water Congress Summer Convention, Snowmass Village. For info: Richard MacRavey, 303/ 837-0812, email: macravey@cowatercongress.org, website: www.cowatercongress.org/

August 26-27 CA

California Fish & Game Commission, Morro Bay, Veterans Memorial Building, 209 Surf Street, 10 am, RE: Coho Listing & More. For info: CFGC, 916/653-4899, website: www.dfg.ca.gov/fg_comm/2004/2004mtgs.html

August 30-31 CO

Dam Removal: Lessons Learned, Fort Collins, Ft. Collins Marriott, Sponsored by The Environmental & Water Resources Institute of ASCE, RE: Various Aspects of Dam Removal, Communication Across Disciplinary Boundaries, Permitting, Economic Impacts, Biological Impacts, Social/Cultural Impacts, Aesthetics/Recreation, and Geomorphologic/Hydrologic Impacts. For info: Katie Gorscak, 703/ 295-6371, or website: www.ewrinstitute.org/damremoval04/colorado/co_register.cfm

September 1 CO

Substitute Water Supply Plan (SWSP) Forum, Denver, Centennial Building, Room 318, 1313 Sherman Street, 9am-12pm. RE: SWSP Matrix, notice, approval or denial of applications, and the appeal process, Speakers: Hal Simpson, State Engineer and staff of DWR, Sponsored by the Colorado Division of Water Resources and the Applegate Group. For info: Trish Abbey (Applegate Group), 303/ 452-6611; email for registration: trishabbey@applegategroup.com

September 7-9 WA

Northwest Power and Conservation Council Meeting, Seattle. For info: NPPC, 800/ 452-5161, email: info@nwcouncil.org, website: www.nwppc.org/

September 9-10 OR

Oregon Environmental Quality Commission (EQC) Meeting, Bandon. For info: Mikell O'Mealy, DEQ, Office of the Director, 503/ 229-5301 or email: deq.info@deq.state.or.us

September 12-15 WA

Second National Conference on Coastal and Estuarine Habitat Restoration, Seattle, Washington State Convention & Trade Center, RE: Coastal and Estuarine Habitat Restoration. For info: Nicole Maylett, 703/ 524-0248, email: nmaylett@estuaries.org, website: www.estuaries.org

September 12-17 CA

Pacific Fisheries Management Council Meeting, San Diego, Hyatt Regency Islandia, For info: For info: Kerry Aden, 866/ 806-7204; email: Kerry.Aden@noaa.gov, website: www.pcouncil.org

September 13-14 TX

Texas Water Law 14th Annual Conference, Austin, Marriot at the Capitol, Sponsored by CLE International. For info: CLE Int'l, 303/ 377-6600, or toll-free 800/ 873-7130, email: registrar@cle.com, website: www.cle.com

September 13-14 CO

Western Water Law 11th Annual Conference, Denver, Hyatt Regency Hotel, Sponsored by CLE International. For info: CLE Int'l, 303/ 377-6600, or toll-free 800/ 873-7130, website: www.cle.com

September 14-15 CO

Colorado Water Conservation Board Meeting - CAN-CELLED

September 15-18 AZ

"Focusing on the Value of Water" Arizona Hydrological Society 17th Annual Symposium, Tucson. For info: website: www.hydrosoc.org

September 16-17 CO
Natural Resources and Environmental Administrative Law & Procedure

Conference, Denver. For info: Rocky Mountain Mineral Law Foundation, 303/ 321-8100, website: www.rmmlf.org

September 17 OR
9th Annual Conference on Stormwater, Portland,

World Trade Center Two, RE: Clean Water Act Permitting; Legislative Concepts; Coordinating Compliance: Clean Water Act, Safe Drinking Water Act, Endangered Species Act & Other Acts; Land Use and Water Quality – Goal 6 and NPDES Permits; TMDLs & Stormwater Permits; Permit Appeals, Enforcement, Citizen Suits & Litigation; Sediment & Erosion Control at Construction Sites; BMP Effectiveness; New Turbidity Standards; More. For info: Environmental Law Education Center, 503/ 282-5220 or website www.elecenter.com

September 20-21 CO
Colorado Water Congress

Water Law Seminar, Denver, CWC Conference Room, 1580 Logan Street, Suite 400, RE: History of Colorado Water Law, Water Distribution Organizations, Water Court System and Procedure, Impact on Colorado of Interstate Compacts, Relationship Between the Federal Government and Colorado Water Law, Colorado Ground Water Law, Water Conservancy Districts, Engineering Aspects of Water Rights, Power Development Authority. Colorado Water Conservation Board, Denver Water System, Western Colorado Water Projects, Federal & State Water Quality Laws, Ethics and Water Law. For info: www.cowatercongress.org/

September 20-21 AZ
Environmental & Natural Resources Law and the Reservation 8th Annual

Conference, Phoenix, Hilton Phoenix East, Sponsored by CLE International. For info: CLE Int'l, 303/ 377-6600, or toll-free 800/ 873-7130, email: registrar@cle.com, website: www.cle.com

September 21-22 NM

49th Annual Water Conference, Ruidoso, New Mexico Water Resources Research Institute. For info: Cathy Ortega Klett, 505/ 646-1195; email: coklett@wrri.nmsu.edu, website: <http://wrri.nmsu.edu/>

September 22-23 CA

Continuing Legal Education for Water Attorneys, Association of California Water Agencies, South Lake Tahoe, Harrah's, RE: Latest Information on Hottest Legal Issues Facing California's Water Community. ACWA is State Bar of California approved MCLE provider. For info: Ellie Meek, 888/ 666-2292, email: elliem@acwanet.com; internet: <http://acwanet.com/events/04>

September 23-24 OR
Oregon Wetlands Conference,

Portland, 5th Avenue Suites Hotel, 9am Both Days. For Attorneys, Government Officials, Developers, Consultants & Engineers, and Environmental Professionals. RE:: Perspectives from the Oregon Division of State Lands; US Army Corps; Wetland Identification and Valuation; Isolated, Artificial & Agricultural Wetlands; Enforcement; and the Role of Interest Groups. More. For info: The Seminar Group, 800-574-4852 or website: www.theseminargroup.net/

September 23-24 CA
Managing Aquifers for Sustainability - Protection

Restoration, Replenishment & Water Reuse, Sonoma County, 13th Annual Meeting & Conference of the Groundwater Resources Association of California, DoubleTree Hotel Rohnert Park. For info: GRAC, 916/ 446-3626, website: www.grac.org.

September 23-24 WA

"The Mighty Columbia: Where's the Power?" Seminar, Seattle, The Westin, Sponsored by The Seminar Group, RE: Legal, Financial, and Public Interest Aspects of Electric Power Generation and Transmission. For info: The Seminar Group, 800/ 574-4852, email: registrar@theseminargroup.net

September 26-29 AZ

Dam Safety 2004, ASDSO's 21st Annual Conference, Association of State Dam Safety Officials, Phoenix, Pointe South Mountain Resort, RE: Dam Failures/Incidents, Hydrology&Hydraulics, Emergency Preparedness, Security, Dam Owner Issues, Safety Regulatory Programs, Inspections, Construction, Rehabilitation and Design. For info: <http://www.damsafety.org>.

September 27-29 UT

Western Water Supply Challenges Conference, Salt Lake City, Little America Hotel, 500 South Main Street, Sponsored by the Western States Water Council. For info: 801/ 561-5300, website: www.westgov.org/wswc/

September 28-29 OR

Energizing the Northwest, BPA Conference, Portland, DoubleTree Hotel/Jantzen Beach, RE: Energy Efficiency; Transmission; System Reliability; Environmental Stewardship; More. For info: website: www.bpa.gov/conferences

September 30 CA
State Water Resources Control Board (Cal EPA),

Sacramento, 1001 I Street (Coastal Hearing Room), 10am. For info: Debbie Irvin, Clerk, 916/ 341-5600, email: dirvin@swrcb.ca.gov, website: www.swrcb.ca.gov/wksmtgs/schedule.html

Sept 30 - Oct 1 DC

Criminal Enforcement of Environmental Laws, American Law Institute-American Bar Association Study Course, Washington DC. For info: ALI-ABA, 800-253-6397 or website: www.ali-aba.org

Oct 12-14 MT

Northwest Power and Conservation Council Meeting, Location TBA. For info: NPPC, 800/ 452-5161, email: info@nwcouncil.org, website: www.nwppc.org/

October 13 CO

Workshop on Water Quality, Denver, CWC Conference Room, 1580 Logan Street, Suite 400, Sponsored by Colorado Water Congress. For info: 303/ 837-0812, email: macravey@cowatercongress.org, website: www.cowatercongress.org/

October 14 CO

Workshop on Endangered Species, Denver, CWC Conference Room, 1580 Logan Street, Suite 400, Sponsored by Colorado Water Congress. For info: 303/ 837-0812, email: macravey@cowatercongress.org, website: www.cowatercongress.org/

October 14-15 MT

Montana Water Law – 4th Annual Conference, Helena, The Montana Club, Sponsored by The Seminar Group, RE: Legislative Update, Adjudication, Permitting, Water Trading, Enforcement of Instream Water Rights, Clean Water Act, Dam

(continued from previous page)

Removal, Wetlands, Cyanide Leaching, What's Working and More. For info: The Seminar Group, 800/ 574-4852, website: www.theseminargroup.net/

October 14-15 NE
Law of the Missouri River, Water Rights, Management and Policy, Omaha, Sheraton Hotel, 1615 Howard Street. For info: 800/873-7130 or website: www.cle.com

October 14-15 TX
Endangered Species Act, Austin. For info: 800/873-7130 or website: www.cle.com

October 18-20 ID
Water Information Management Systems Workshop, Western States Water Council, Sun Valley, Sun Valley Resort, For info: : WSWC, 801/ 561.5300, website: www.westgov.org/wswc/meetings.html

October 19-20 OK
2004 Governor's Water Conference: Oklahoma Water: A Quality of Life, Oklahoma City, Cox Convention. For info: Oklahoma Water Resources Board, 405/ 530-8800, website: www.owrb.state.ok.us/about/contact/contactus.php

October 21 CA
State Water Resources Control Board (Cal EPA), Sacramento, 1001 I Street (Coastal Hearing Room), 10am. For info: Debbie Irvin, Clerk, 916/ 341-5600, email: dirvin@swrcb.ca.gov, website: www.swrcb.ca.gov/wksmtgs/schedule.html

October 21-22 OR
Oregon Environmental Quality Commission (EQC) Meeting, Tillamook. For info: Mikell O'Mealy, DEQ, Office of the Director, 503/ 229-5301

October 21-22 OR
Oregon Water Resources Commission Meeting, Location TBA. For info: Dianne Addicott, WRD, 503/ 986-0875, website: www.wrd.state.or.us

October 27-29 NM
Western States Water Council Fall Meeting, 146th Council Meeting, Santa Ana Pueblo, Hyatt Regency Tamaya Resort & Spa, 1300 Tuyuna Trail, For info: : WSWC, 801/ 561.5300, website www.westgov.org/wswc/meetings.html

October 27-29 CA
Water Quality Conference, Ontario, Sponsored by East Valley Water District and the Water Education Foundation. For info: www.eastvalley.org/Water%20Quality%20Conference/home-wtr-quality-confinfo.htm

October 28-29 CA
California Water Law, San Diego, For info: 800/873-7130 or website: www.cle.com

October 28-29 D.C.
Clean Water Act: Law and Regulation, ALI-ABA, Washington, DC, Hilton Embassy Row. For info: 800/ 253-6397 or website: www.ali-aba.org

October 28-29 OR
Environmental Quality Commission Meeting, Location TBA For info: Mikell O'Mealy, 800/452-4011, email: deq.info@deq.state.or.us

Oct 31-Nov 5 OR
Pacific Fisheries Management Council Meeting, Portland, Embassy Suites Hotel Portland Airport, , For info: For info: Kerry Aden, 866/ 806-7204; email: Kerry.Aden@noaa.gov, website: www.pccouncil.org

November 1-3 WA
Watershed Planning: Approaches, Challenges, and Strategies for Success, Symposium, Stevenson, Skamania Lodge. The North Pacific International Chapter of the American Fisheries Society and the Sustainable Fisheries Foundation Presentation. Ecosystem-Based Watershed Plans; Overcoming Barriers; More. and move toward ecosystem-based watershed management. For info: Sustainable Fisheries Foundation, 250/ 729-9625

November 4-5 OR
Oregon Water Law – 13th Annual Conference, Portland, Sponsored by The Seminar Group, RE: For info: The Seminar Group, 800/ 574-4852, website: www.theseminargroup.net/



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